Mitigated Negative Declaration

San Juan School Reconstruction

January 31, 2024

Prepared by

EMC Planning Group

AROMAS-SAN JUAN UNIFIED SCHOOL DISTRICT
District Office
2300 San Juan Highway, San Juan Bautista, CA 95045
Tel: 831-623-4500 Fax: 831-623-4907
www.asjusd.org

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

In compliance with the California Environmental Quality Act (CEQA), the Aromas-San Juan Unified School District has undertaken environmental review for the proposed San Juan School Reconstruction located at 100 Nyland Drive in the City of San Juan Bautista, and intends to adopt a Mitigated Negative Declaration. The Aromas-San Juan Unified School District invites all interested persons and agencies to comment on the proposed San Juan School Reconstruction.

Lead Agency:	Aromas-San Juan Unified School District
Project Location:	100 Nyland Drive, San Juan Bautista
Project Description:	The Aromas-San Juan Unified School District is proposing to reconstruct approximately 5.18 acres of the San Juan School property into 15 modular classrooms, two modular restroom utility pods, one modular library/makespace, one administration building, a multipurpose structure, and food service. The project also involves the addition of a pedestrian hardscape, landscaping, drop-off facilities along the south side of the school, new on-site utilities, and one additional basketball court. The project would not increase the school's enrollment capacity.
Public Review Period:	Begins– Friday, February 9, 2024 Ends – Monday, March 11, 2024
Proposed Mitigated Negative Declaration is Available for Public Review at these Locations:	District Website: asjusd.org Aromas-San Juan Unified School District 2300 San Juan Highway San Juan Bautista, CA 95045
Address Where Written Comments May be Sent:	Daniel Ornelas, Chief Business Official Aromas-San Juan Unified School District 2300 San Juan Highway San Juan Bautista, CA 95045 Or via email to: dornelas@asjusd.org
Public Hearing:	Date: April 10, 2024 Time: 7 PM Location: Anzar High School Library 2000 San Juan Highway San Juan Bautista

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PROPOSED MITIGATED NEGATIVE DECLARATION

In Compliance with the
California Environmental Quality Act (CEQA)

Project Name	San Juan School Reconstruction
Lead Agency	Aromas-San Juan Unified School District
Project Proponent	Aromas-San Juan Unified School District
Project Location	100 Nyland Drive, San Juan Bautista
Project Description	The Aromas-San Juan Unified School District is proposing to reconstruct approximately 5.18 acres of the San Juan School property into 15 modular classrooms, two modular restroom utility pods, one modular library/makespace, one administration building, a multipurpose structure, and food service. The project also involves the addition of a pedestrian hardscape, landscaping, drop-off facilities along the south side of the school, new on-site utilities, and one additional basketball court. The project would not increase the school's enrollment capacity.
Public Review Period	Begins– Friday, February 9, 2024 Ends – Monday, March 11, 2024
Written Comments To	Daniel Ornelas, Chief Business Official Aromas-San Juan Unified School District 2300 San Juan Highway San Juan Bautista, CA 95045 Or via email to: dornelas@asjusd.org
Proposed Findings	The Aromas-San Juan Unified School District is the custodian of the documents and other material that constitute the record of proceedings upon which this decision is based. The initial study indicates that the proposed project has the potential to result in significant adverse environmental impacts. However, the mitigation measures identified in the initial study would reduce the impacts to a less than significant level. There is no substantial evidence, in light of the whole record before the lead agency Aromas-San Juan Unified School District that the project, with mitigation measures incorporated, may have a significant effect on the

environment. See the following project-specific mitigation measures:

Mitigation Measures

Biological Resources

BIO-1 California tiger salamander and California red-legged frog have been recorded in close proximity to the project site. The school district will obtain Incidental Take Permits from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) for potential project impacts to California tiger salamander and California red-legged frog and implement all avoidance, minimization, and compensatory mitigation measures required by these permits.

Take permit conditions may include, but not be limited to, the following avoidance and minimization measures identified below to minimize the potential for "take" of California tiger salamander and California red-legged frog:

a. At least 15 days prior to ground disturbance, the biologist shall submit the name and credentials of the project biologists who would conduct activities specified in this measure. No project activities shall begin until the biologist has received written approval from the USFWS and CDFW that the biologists are qualified to conduct the work.

b. The qualified biologist shall conduct preconstruction surveys for California red-legged frog and California tiger salamander no more than two weeks (14 days) prior to the start of construction activities. The project site will be surveyed for potential migratory and/or upland activity. The qualified biologist shall prepare a report documenting the results of the preconstruction surveys for submittal to the school district prior to ground disturbance.

c. Biologists shall have the authority to halt construction work at any time to prevent harm to California tiger salamander and California red-legged frog or when any of the permit-specified protection measures have been violated. Work shall re-commence only when authorized by the biologists. If work is stopped due to potential harm to protected species, the project biologists shall contact the USFWS and/or CDFW by telephone or email on the same day to communicate the event and coordinate appropriate action.

d. Biologists shall conduct biological construction monitoring for California tiger salamander and California red-legged frog during ground-disturbing activities. Before the start of work each day, a biologist or their designee shall check for wildlife under any equipment such as vehicles and stored pipes within active construction zones. A biologist or their designee shall also check all excavated steep-walled holes or trenches greater than one foot deep for trapped animals. If California tiger salamander or California red-legged frog is observed within an active construction zone, a biologist shall be notified immediately and all work within 100 feet of the individual animal shall be halted and all equipment turned off until the biologist has captured and removed the individual from the work area. Individuals shall be relocated to a USFWS/CDFW-approved off-site location according to permit specifications.

e. Offsite habitat mitigation. Offsite habitat shall be procured at an appropriate ratio of project site impact area to compensation habitat area, as determined in coordination with

USFWS and/or CDFW. Offsite mitigation may include purchasing credits at a mitigation bank or permanent protection of land with established aquatic and upland habitat or sites with known upland habitat where the creation of a pond may enhance the habitat value of the site.

BIO-2 Prior to ground disturbance, the school district shall hire a qualified biologist to conduct a training session for all construction personnel. At a minimum, the training shall include a description of special-status species potentially occurring in the project vicinity, including, but not limited to, California tiger salamander, California red-legged frog, burrowing owl, special-status bats, and nesting birds and raptors. Their habitats, general measures that are being implemented to conserve species as they relate to the project, and the boundaries within which construction activities will occur will be explained. Informational handouts with photographs clearly illustrating the species' appearances shall be used in the training session. All new construction personnel shall undergo this mandatory environmental awareness training.

The qualified biologist shall provide documented evidence of completion of this training to the school district prior to ground disturbance.

BIO-3 To avoid loss of or harm to burrowing owl, the following measures shall be implemented:

a. Prior to issuance of a grading permit, and to avoid/minimize impacts to burrowing owls potentially occurring within the project site, the school district shall retain a biologist qualified in ornithology to conduct surveys for burrowing owl. The qualified biologist shall conduct a two-visit (i.e., morning and evening) presence/absence survey at areas of suitable habitat on and adjacent to the project site boundary no less than 14 days prior to the start of construction or ground disturbance activities. Surveys shall be conducted according to the methods for take avoidance described in the Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993) and the Staff Report on Burrowing Owl Mitigation (CDFW 2012). If no burrowing owls are found, a letter report confirming absence shall be prepared and submitted to the school district and no further measures are required.

b. Because burrowing owls occupy habitat year-round, seasonal no-disturbance buffers, as outlined in the Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993) and the Staff Report on Burrowing Owl Mitigation (CDFW 2012), shall be in place around occupied habitat prior to and during any ground disturbance activities. The following table includes buffer areas based on the time of year and level of disturbance (CDFW 2012), unless a qualified biologist approved by the California Department of Fish and Wildlife verifies through non-invasive measures that either:
1) birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

Location	**Time of Year**	**Level of Disturbance Buffers (meters)**		
		Low	**Med**	**High**

Nesting Sites	April 1 – Aug 15	200 m	500 m	500 m
Nesting Sites	Aug 16 – Oct 15	200 m	200 m	500 m
Nesting Sites	Oct 16 – Mar 31	50 m	100 m	500

c. If burrowing owl is found and avoidance is not possible, burrow exclusion may be conducted by qualified biologists only during the non-breeding season, before breeding behavior is exhibited and after the burrow is confirmed empty through non-invasive methods, such as surveillance. Occupied burrows shall be replaced with artificial burrows at a ratio of one collapsed burrow to one constructed artificial burrow (1:1). Evicted burrowing owls may attempt to colonize or re-colonize an area that would be impacted, thus ongoing surveillance during project activities shall be conducted at a rate sufficient to detect burrowing owls if they return.

d. If surveys locate occupied burrows in or near construction areas, consultation with the California Department of Fish and Wildlife shall occur to interpret survey results and develop a project-specific avoidance and minimization approach. Once the absence of burrowing owl has been confirmed, a letter report shall be prepared and submitted to the school district.

BIO-4 The following measures shall be implemented to avoid loss of or harm to special-status bat species:

a. Approximately 14 days prior to construction activities, a qualified biologist shall conduct a habitat assessment for bats and potential roosting sites in trees or buildings within 50 feet of the construction easement. These surveys shall include a visual inspection of potential roosting features (bats need not be present) and a search for presence of guano within the project site, construction access routes, and 50 feet around these areas. Cavities, crevices, exfoliating bark, and bark fissures that could provide suitable potential nest or roost habitat for bats shall be surveyed. Assumptions can be made on what species is present due to observed visual characteristics along with habitat use, or the bats can be identified to the species level with the use of a bat echolocation detector such as an "Anabat" unit. Potential roosting features found during the survey shall be flagged or marked.

b. If no roosting sites or bats are found, a letter report will be prepared by the biologist and submitted to the school district, where it will be kept on file, and no further measures are required.

c. If bats or roosting sites are found, bats shall not be disturbed without specific notice to and consultation with California Department of Fish and Wildlife.

d. If bats are found roosting outside of the nursery season (May 1 through October 1), California Department of Fish and Wildlife shall be consulted prior to any eviction or other action. If avoidance or postponement is not feasible, a Bat Eviction Plan will be submitted to California Department of Fish and Wildlife for written approval prior to project implementation. A request to evict bats from a roost includes details for excluding bats from the roost site and monitoring to ensure that all bats have exited the roost prior to the start of activity and are unable to re-enter the roost until activity is completed. Any bat eviction shall be timed to avoid lactation and young-rearing. If bats are found roosting during the nursery season, they shall be monitored to determine if the roost site is a maternal roost. This could occur by either visual inspection of the roost bat pups, if possible, or by monitoring the roost after the adults leave for the night to listen for bat pups. Because bat pups cannot leave the roost until they are mature enough, eviction of a maternal roost cannot occur during the nursery season. Therefore, if a maternal roost is present, a 50-foot buffer zone (or different size if determined in consultation with the California Department of Fish and Wildlife) shall be established around the roosting site within which no construction activities including tree removal or structure disturbance shall occur until after the nursery season.

BIO-5 To avoid impacts to nesting birds during the nesting season (January 15 through September 15), all Phase I construction activities should be conducted between September 16 and January 14, which is outside of the bird nesting season. If construction or project-related work is scheduled during the nesting season (February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), a qualified biologist shall conduct nesting bird surveys.

a. Two surveys for active bird nests will occur within 14 days prior to start of construction, with the final survey conducted within 48 hours prior to construction. Appropriate minimum survey radii surrounding each work area are typically 250 feet for passerines, 500 feet for smaller raptors, and 1,000 feet for larger raptors. Surveys will be conducted at the appropriate times of day to observe nesting activities. Locations off the site to which access is not available may be surveyed from within the site or from public areas. If no nesting birds are found, a letter report confirming absence will be prepared and submitted to the school district and no further mitigation is required.

b. If the qualified biologist documents active nests within the project site or in nearby surrounding areas, an appropriate buffer between each nest and active construction shall be established. The buffer shall be clearly marked and maintained until the young have fledged and are foraging independently. Prior to construction, the qualified biologist shall conduct baseline monitoring of each nest to characterize "normal" bird behavior and establish a buffer distance, which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds daily during construction activities and increase the buffer if birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman shall have the authority to cease all construction work in the area until the young have fledged and the nest is no longer active. Once the absence of nesting birds has been confirmed, a letter report will be prepared and submitted to the school district.

BIO-6 Prior to any ground disturbance, the school district will hire an International Society of Arboriculture (ISA)-certified arborist to conduct a tree survey and prepare an evaluation report with associated data and location map for all potentially affected native trees on and immediately adjacent to the project site. The school district will follow the arborist's recommendations, such as planting replacement trees in appropriate on-site or off-site areas, along with any required maintenance and monitoring.

Cultural Resources

CR-1 The school district will hire a qualified archaeologist to monitor earth-moving activities when such activities disturb soils at least 18 inches below the surface. This mitigation will be included on all grading and construction plans.

CR-2 If any prehistoric or historic subsurface cultural resources, including tribal cultural resources, are discovered during ground-disturbing activities (including tree and vegetation removal, tree planting, demolition and/or grading):

a. All work within 50 feet of the resources shall be halted and a qualified archaeologist shall be consulted to assess the significance of the find according to CEQA Guidelines Section 15064.5.

b. Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation (DPR) forms and evaluated for significance by a qualified Archaeologist. Significant cultural resources consist of but are not limited to stone, bone, glass, ceramics, fossils, wood, or shell artifacts, or features including hearths, structural remains, or historic dumpsites.

c. All significant prehistoric cultural materials and or tribal cultural resources recovered shall be returned to Native American tribes traditionally and culturally affiliated with the area.

d. In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts to historical resources or unique archaeological resources, the lead agency shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, proposed project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) would be implemented.

e. Work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is being carried out.

CR-3 California Health and Safety Code Section 7050.5 and the CEQA Guidelines Section 15064.5(e) contain the mandated procedures of conduct following the discovery of human remains. According to the provisions in CEQA, if human remains are encountered at the site, all work in the immediate vicinity of the discovery shall cease and necessary steps to ensure the integrity of the immediate area shall be taken. The San Benito County Coroner shall be notified immediately. The coroner shall then determine whether the remains are Native American. If the coroner determines the remains are Native American, the Coroner shall notify the Native American Heritage Commission within 24 hours, who would, in turn, notify the person the Native American Heritage Commission identifies as the Most Likely Descendant (MLD) of any human remains. Further actions shall be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the Native American Heritage Commission of the discovery. If the Most Likely Descendant does not make recommendations within 48 hours, the owner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance. Alternatively, if the owner does not accept the Most Likely Descendant's recommendations, the owner or the descendent may request mediation by the Native American Heritage Commission.

Geology and Soils

GEO-1 The school district will conduct surface rupture hazards studies for the proposed new construction that was not previously evaluated through fault trenching. Mitigation measures from the surface rupture hazards studies will be implemented, which may include, but not be limited to, a building setback from an active fault trace, prior to any earth-moving activities (reference page 19, McCloskey Consultants).

GEO-2 To address the site-specific potential for geologic hazards attributable to ground shaking, the school district will conduct a review of the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website and, if ground motion hazard analysis is determined to be required, additional analysis will be conducted, seismic factors will be updated, and the 2019 CBC values will also be updated. Mitigation measures regarding site preparation and building construction shall be implemented (reference page 19, McCloskey Consultants).

GEO-3 Prior to initiation of any grading or land clearing activities, the school district will prepare and implement an erosion control plan indicating methods to sufficiently control runoff, erosion, and sediment movement during earth moving activities. The erosion control plan will also identify site design and post-construction treatment control measures to limit stormwater runoff and control erosion.

GEO-4 The school district will implement the recommendations in the *CDE/CCR Title 5 Geologic and Safety Hazards Evaluation* to ensure unstable soil, that may become unstable as a result of the proposed project, would not result in significant lateral spreading, subsidence, liquefaction, or collapse (reference page 15).

GEO-5 The school district will implement the recommendations in the *CDE/CCR Title 5 Geologic and Safety Hazards Evaluation* to ensure expansive soils would not substantial direct or indirect risks to life or property (reference page 16).

GEO-6 The following language will be included on all construction plans: "If paleontological resources are discovered during demolition and earthmoving activities, work shall stop within 100 feet of the find until a qualified paleontologist can assess if the find is unique and, if necessary, develop appropriate treatment measures."

Hazards and Hazardous Materials

HAZ-1 Prior to any demolition and/or ground breaking activities, the school district will prepare a preliminary endangerment assessment (PEA) to determine if there are on-site hazardous materials that require removal. If the PEA concludes that that hazardous materials need to be removed from the project site, a removal action workplan (RAW) will be prepared, subject to review and approval by DTSC.

HAZ-2 Prior to any demolition and/or ground breaking activities, the school district will contact to the Monterey Bay Air Resources District to determine if an asbestos renovation & demolition permit is required. If one is required, the school district will apply for and obtain the permit, and implement any conditions of approval that may be required.

Hydrology and Water Quality

HWQ-1 Prior to any demolition and/or ground breaking activities, the school district will prepare an erosion/siltation control plan to ensure that soil erosion during demolition, grading, and construction activities would not flow off-site to the adjacent riparian drainage.

Noise

N-1 The school district will include the following language on all demolition and construction documents. "Demolition and construction activities shall be limited to daylight hours and all construction equipment shall be properly muffled and maintained to further reduce noise generation."

INITIAL STUDY

San Juan School Reconstruction

PREPARED FOR

Aromas-San Juan Unified School District
Daniel Ornelas, Chief Business Officer
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January 31, 2024

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Appendices

Figures

A. BACKGROUND

Project Title	San Juan School Reconstruction
Lead Agency Contact Person and Phone Number	Dr. Barbara Dill-Varga, Superintendent 831-623-4500
Date Prepared	January 2024
Study Prepared by	EMC Planning Group Inc. 601 Abrego Street Monterey, CA 93940
Project Location	100 Nyland Drive San Juan Bautista, CA 95045
Project Sponsor Name and Address	Aromas-San Juan Unified School District 2300 San Juan Highway San Juan Bautista, CA 95045
General Plan Designation	Public Facility
Zoning	Public Facility

Setting

San Juan School is located at 100 Nyland Drive (APN 002-500-0050) in the City of San Juan Bautista and serves preschool through eighth grade students. San Juan Bautista is located approximately five miles west of Hollister and approximately 8.5 miles northeast of the Salinas. The San Juan School property consists of approximately 12 acres. The project site (area of disturbance) consists of approximately 5.18 of the 12 acres. The remaining approximately seven acres consist of play fields which is bisected by a tree-lined drainage. The property is surrounded by agricultural uses and a residence to the east, Nyland Drive and State Route 156 and residences to the south, commercial uses and residences to the west, and agricultural uses to the north. The San Andreas Fault is also located approximately 160 feet north of the site; therefore, the school property is located within an Alquist Priolo Fault Zone (California Department of Conservation 2023).

Figure 1, Location Map, provides a regional view of the project location, Figure 2, Aerial Photograph, provides an aerial of the project site and its surrounding land uses, and Figure 3, Site Photographs, illustrates the existing project site conditions with site photographs.

Description of Project

Physical Improvements

The Aromas-San Juan Unified School District ("school district") is proposing to reconstruct the existing campus, approximately 5.18 acres of the San Juan School property, into 15 modular classrooms, two modular restroom utility pods, one modular library/makeSPACE, one administration building, a multipurpose structure, and food service ("proposed project"). The project would occur on the existing school site boundaries with no expansion into the adjacent wetland/riparian corridor to the northwest of the campus. The project involves demolition of the existing single-story structures and removal of trees located within the project site. The project also includes the addition of a pedestrian hardscape, landscaping, drop-off facilities along the south side of the school, and new on-site utilities. One new basketball court will also be constructed. The project would not increase the school's enrollment capacity.

The project site plan is presented in Figure 4, Site Plan, shows the project's site plan, including construction staging areas. Appendix A, San Juan School Campus Upgrades Project, provide additional project details.

Construction Schedule and Staging

Construction is currently scheduled to begin in June 2024 when school is out for summer break. Construction staging areas, as depicted in Figure 4, Site Plan, are generally located in existing parking and disturbed areas along Nyland Drive and The Alameda.

Other Public Agencies Whose Approval is Required

- Division of the State Architect (California Department of General Services) (Written Approval of Plans Letter)
- California Department of Toxic Substances Control (Approval of a Preliminary Endangerment Assessment and possibly a Removal Action Work [RAW] Plan)
- Monterey Bay Air Resources District (Asbestos Renovation & Demolition)
- Regional Water Quality Control Board (NPDES Permit)
- California Department of Fish & Wildlife (Incidental Take Permit)
- U.S. Fish & Wildlife Service (Incidental Take Permit)

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

The school district sent out consultation offer letters to the Native American Heritage Commission's list of Native American Tribes affiliated with the project area, including the Amah Mutsun Tribal Band, the Indian Canyon Mutsun Band of Costanoan, Wuksachi Indian Tribe/Eshom Valley Band, and the Amah Mutsun Tribal Band of Mission San Juan Bautista, on December 12, 2023. As of January 31, 2024, no requests for consultation have been received.

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

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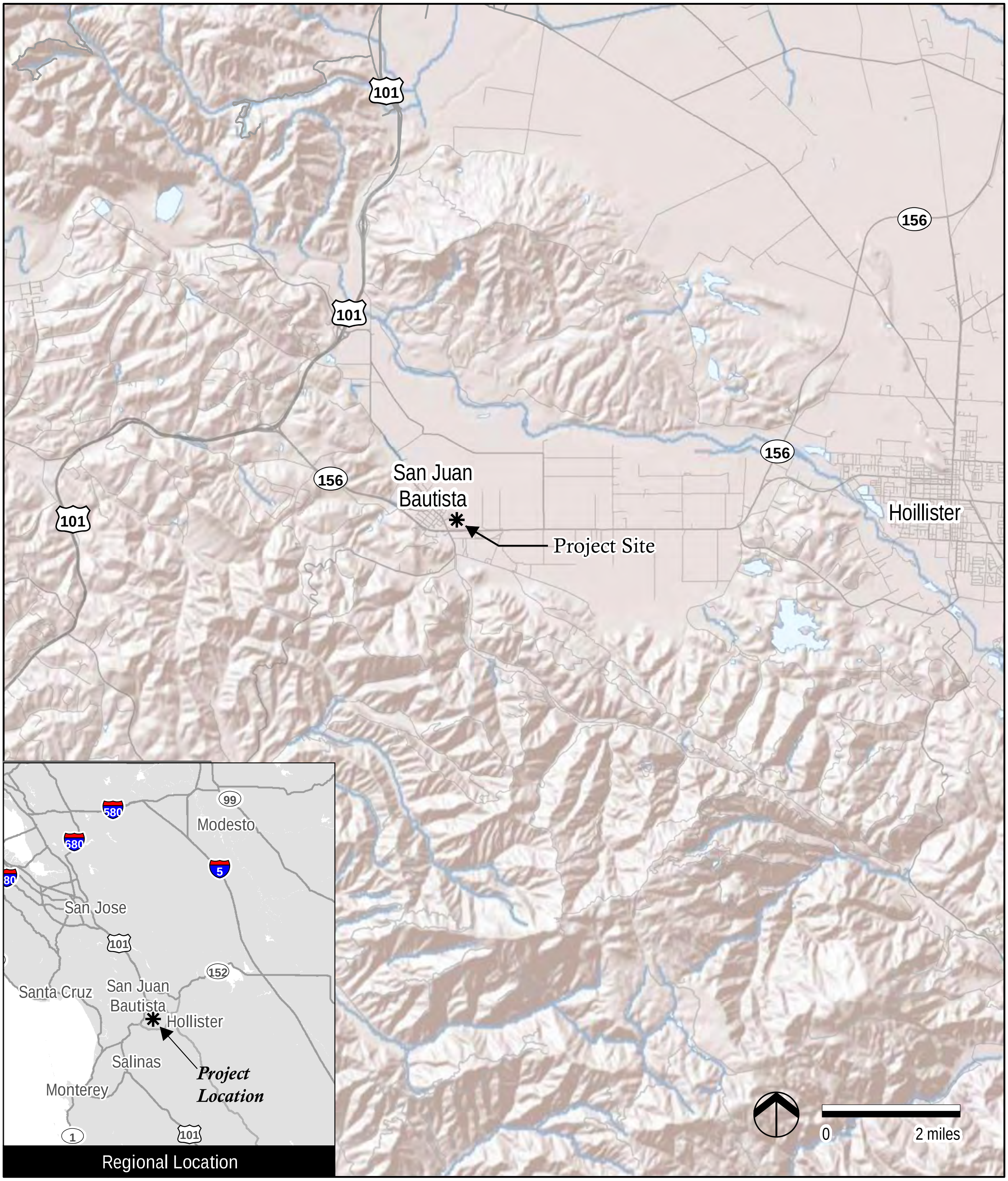

Source: ESRI 2023, San Benito County GIS 2023,
Monterey County GIS 2023, Santa Clara County GIS 2023

Figure 1
Location Map

E M C

San Juan School Reconstruction Initial Study

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Source: San Benito County GIS 2023, Google Earth 2023, USGS 2023

Figure 2
Aerial Photograph

San Juan School Reconstruction Initial Study

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(1) Facing northwest at the existing basketball courts.

(2) Facing north at existing structures.

Project Site

Source: Google Earth 2023
Photographs: EMC Planning Group 2023

(3) Facing northeast at an existing structure.

(4) Facing northeast at the southeastern end of the project site.

Figure 3
Site Photographs

E M C

San Juan School Reconstruction Initial Study

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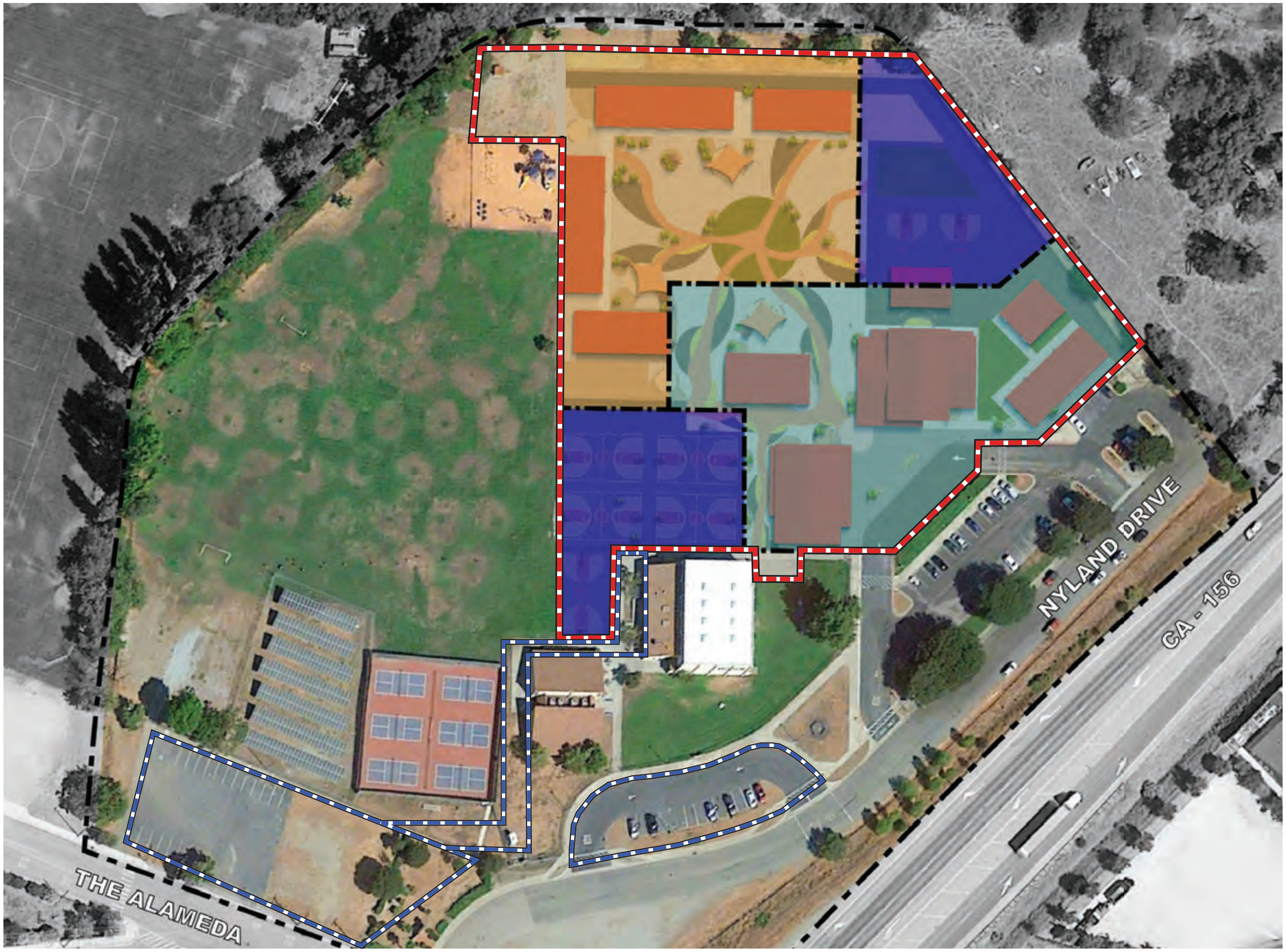

0 120 feet

Project Site

Staging Areas

Phase 1 - Demo Existing / New Classroom Pods, Site Work Temporary Admin and MDF Facilities

Phase 2 - Demo Existing / New Admin Building and Kinder/TK Pods

Phase 3 - Demo Existing / New Sitework

Source: Aedis Architects 2023

E M C

Figure 4

Site Plan

San Juan School Reconstruction Initial Study

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B. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Public Services
☐ Agriculture and Forestry Resources	☐ Hazards & Hazardous Materials	☐ Recreation
☐ Air Quality	☐ Hydrology/Water Quality	☐ Transportation
☐ Biological Resources	☐ Land Use/Planning	☐ Tribal Cultural Resources
☐ Cultural Resources	☐ Mineral Resources	☐ Utilities/Service Systems
☐ Energy	☐ Noise	☐ Wildfire
☐ Geology/Soils	☐ Population/Housing	☐ Mandatory Findings of Significance

C. DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (1) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (2) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Dr. Barbara Dill-Varga, Superintendent	Date

D. EVALUATION OF ENVIRONMENTAL IMPACTS

Notes

1. All answers take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
2. Once it has been determined that a particular physical impact may occur, then the checklist answers indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
3. "Negative Declaration: Less-Than-Significant Impact with Mitigation Measures Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less-Than-Significant Impact." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less-than-significant level (mitigation measures from section XVII, "Earlier Analyses," may be cross-referenced).
4. Earlier analyses are used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. [Section 15063(c)(3)(D)] In this case, a brief discussion would identify the following:
    a. "Earlier Analysis Used" identifies and states where such document is available for review.
    b. "Impact Adequately Addressed" identifies which effects from the checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and states whether such effects were addressed by mitigation measures based on the earlier analysis.
    c. "Mitigation Measures"—For effects that are "Less-Than-Significant Impact with Mitigation Measures Incorporated," mitigation measures are described which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
5. Checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances, etc.) are incorporated. Each reference to a previously prepared or outside document, where appropriate, includes a reference to the page or pages where the statement is substantiated.
6. "Supporting Information Sources"—A source list is attached, and other sources used or individuals contacted are cited in the discussion.
7. The explanation of each issue identifies:
    a. The significance criteria or threshold, if any, used to evaluate each question; and
    b. The mitigation measure identified, if any to reduce the impact to less than significant.

1. AESTHETICS

Except as provided in Public Resources Code Section 21099 (Modernization of Transportation Analysis for Transit-Oriented Infill Projects), would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b. Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Comments:

a. The Draft City of San Juan Bautista 2035 General Plan – Final Environmental Impact Report ("General Plan EIR") states that there are no officially designated scenic vistas or view corridors in the City of San Juan Bautista ("City") However, two scenic vistas are considered important by the community: the panoramic scenery of the surrounding agricultural land and the San Juan Valley hillsides; and the views of the Historic Mission San Juan Bautista (City of San Juan Bautista 2015, p. 71).

The proposed project is the reconstruction of an existing school, which is located approximately 0.40 miles from the mission, and existing views of the hillsides are already obstructed under existing conditions at the site. Therefore, the proposed project would not have an adverse effect on a scenic vista.

b. According to the California State Scenic Highway System Map, State Route 156 is eligible for designation as a state scenic highway (California Department of Transportation 2023). State Route 156 is located approximately 160 feet south of the project site. Implementation of the project would not substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway, and would not substantially change the existing views from the highway.

c. The height of the existing buildings are 16 to 22 feet. New buildings will be 13 to 26 feet high (John Dominguez, email message, November 10, 2023). The project site is located in a non-urbanized area, and the proposed project consists of reconstructing the existing school without increasing the footprint or size of the school. Some buildings will be slighted higher, but the proposed project would not degrade the existing visual character or quality of public views of the site and its surroundings.

d. Sources of light exist on the project site from the existing school. The proposed project involves the reconstruction of San Juan School with new school structures and facilities; therefore, the project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

2. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts on agricultural resources are significant environmental effects and in assessing impacts on agriculture and farmland, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Comments:

a. According to the California Department of Conservation's Important Farmland Finder, the project site is entirely within an area designated as "Urban and Built-Up Land" (California Department of Conservation 2023). Therefore, implementation of the project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use.

b. The project site is not under a Williamson Act contract (City of San Juan Bautista 2015, Map 4.2-6) and is not zoned for agricultural use (County of San Benito 2023). Therefore, implementation of the project would not conflict with existing zoning for agricultural use, or a Williamson Act contract.

c-d. There is no forest land or timberland in the San Juan Bautista sphere of influence (City of San Juan Bautista 2015, p. 89). Therefore, implementation of the project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), timberland zoned Timberland Production (as defined by Government Code section 51104(g)), or result in the loss of forest land or conversion of forest land to non-forest use.

e. As indicated previously, there is no forest land in the San Juan Bautista sphere of influence; therefore, the project would not result in the conversion of forest land to non-forest use.

The proposed project involves the reconstruction of an existing elementary school and would not expand the existing boundary of the school campus. Therefore, implementation of the project would not result in other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use.

3. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

		Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
d.	Result in other emissions, such as those leading to odors adversely affecting a substantial number of people?	☐	☐	☐	☒

The project site is located in the North Central Coast Air Basin, which is under the jurisdiction of the Monterey Bay Air Resources District ("air district"), formerly known as the Monterey Bay Unified Air Pollution Control District (MBUAPCD). The air district has regulatory authority over stationary sources of air emissions, monitoring air quality within the air basin, providing guidelines for analysis of air quality impacts pursuant to CEQA, and preparing an air quality management plan to maintain or improve air quality in the air basin. The air district has developed thresholds of significance for criteria air pollutants. These are contained in the *CEQA Air Quality Guidelines* ("CEQA Guidelines") (Monterey Bay Unified Air Pollution Control District 2008).

Comments:

a. A consistency determination is a process by which the Lead Agency demonstrates that the population associated with a proposed project is accommodated by the Association of Monterey Bay Area Governments' regional growth forecasts. The regional growth forecasts for population and dwelling units are embedded in the emission inventory projections used in the air quality plan. Projects within the regional growth forecasts have been accommodated in the air quality plan, and are therefore consistent with the air quality plan. The proposed project is not population generating and would not conflict with or obstruct implementation of the air quality management plan (MBUAPCD Air Quality Guidelines, page 5-10).

b. The proposed project would be a source of air emissions during construction. It would not result in an increase in operational air emissions, as the project would not increase student capacity or the number of teachers. Consequently, only construction emissions impacts are evaluated here. PM_{10} and ozone emissions are those of concern to the air district and for which analysis here is provided. Toxic air contaminants (TACs) are another pollutant of concern during construction – this effect is evaluated in item "c" below.

Emissions from construction activities (e.g., excavation, grading, on-site vehicles) represent temporary effects that are typically considered short term in duration, depending on the size, phasing, and type of project. Construction activities which generate levels of PM_{10} that exceed the established threshold of significance (82 pounds per day) would be considered to have significant impact on local air quality. The air district has established screening thresholds for construction-related activities with minimal earthmoving (8.1 acres per day). Construction projects below the screening level threshold are not considered to have a significant impact. The total San Juan School property consists of approximately 12 acres. However, the project will only take place on approximately 5.18 of the 12 acres and grading needs would be minimal. Therefore, grading activity would not cause PM_{10} emissions to be exceeded; the PM_{10} emissions impact would be less than significant.

Per the air district's CEQA Guidelines, ozone precursor emissions from construction projects using typical equipment are included in the emission inventories of the air quality management plan. Since the proposed project would use typical construction equipment, ozone precursor emissions from project construction have already been accounted for in the emission inventories and would not have a significant impact on the attainment and maintenance of the National or State ambient air quality standards for ozone. Therefore, construction activities would have a less-than-significant air quality impact from ozone generation.

c. Toxic air contaminants (TACs) are pollutants that may be expected to result in an increase in mortality or serious illness or may pose a present or potential hazard to human health. Health effects include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuels combustion, and commercial operations (e.g., dry cleaners). Construction equipment and associated heavy-duty truck traffic generates diesel exhaust and fugitive dust that poses health risks for sensitive receptors. Diesel particulate matter, which is a known TAC, is a component of diesel exhaust. Diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs.

Toxic air contaminants in the form of diesel exhaust from equipment used during construction would be the primary consideration. These would be of most concern where intensive construction activities occur in close proximity to sensitive receptors. Sensitive receptors refer to those segments of the population most susceptible to poor air quality. Children, the elderly, and the chronically or acutely ill are the most sensitive population groups that are more susceptible to adverse effects of air pollution than others. Sensitive receptors are commonly associated with specific land uses such as residential, elementary school, retirement home, and hospital uses. Sensitive receptors in the form of residential uses are located in the vicinity.

TACs such as diesel particulate matter are commonly produced by diesel-powered construction equipment. Construction emissions are considered to be "short-term" in the sense that they would be limited to the duration when such equipment is used. For the proposed project, heavy duty construction equipment operations would be limited. Minimal site preparation will be required – earthmoving equipment use would be nominal. Further, the proposed prefabricated modular buildings manufactured off site will be installed – use of diesel equipment for constructing buildings will also be limited. In short, the project would not require intensive or prolonged use of diesel-powered equipment.

Because construction activities will not be intensive and would not require substantial use of diesel-powered equipment, and would occur over a short period of time, the project would not expose sensitive receptors to substantial pollutant concentrations in the form of TACs. Hazardous materials associated with building demolition are addressed in section 9, Hazards and Hazardous Materials.

d. The most common sources of odors identified in complaints received by local air districts are sewage treatment plants, landfills, recycling facilities, waste transfer stations, petroleum refineries, biomass operations, autobody shops, coating operations, fiberglass manufacturing, foundries, rendering plants, and livestock operations. The proposed school reconstruction would not produce these types or other significant objectionable odors that would adversely affect a substantial number of people. Therefore, there would be no impacts associated with odor.

4. Biological Resources

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	☐	☒
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.), through direct removal, filing, hydrological interruption, or other means?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Comments:

A reconnaissance-level biological field survey of the project site was conducted by EMC Planning Group biologist Inger Marie Laursen on November 10th and 20th, 2023, to document existing plant communities/wildlife habitats and assess the suitability of the site to support special-status species. Biological resources were documented in field notes, including plant and wildlife species observed, dominant plant communities, wildlife habitat quality, disturbance levels, and aquatic resources.

Prior to conducting the survey, Ms. Laursen reviewed site plans, aerial photographs, natural resource database accounts, and other relevant scientific literature. This included searching the U.S. Fish and Wildlife Service (USFWS) *Endangered Species Database* (USFWS 2023b), California Department of Fish and Wildlife (CDFW) *California Natural Diversity Database* (CDFW 2023a, CDFW 2023b), and California Native Plant Society (CNPS) *Inventory of Rare and Endangered Plants* (CNPS 2023) to identify special-status plants, wildlife, and habitats known to occur in the vicinity of the project. A review of the USFWS National Wetlands Inventory (NWI) database was also conducted to identify jurisdictional aquatic features (wetlands, drainages, and/or riparian areas) on or adjacent to the project site (USFWS 2023c).

Existing Conditions

The approximately 12-acre school parcel is located at 100 Nyland Drive, within the City of San Juan Bautista. The school site is located at the northeast corner of State Route 156 and The Alameda, and is surrounded by residential development to the south and west, and agricultural uses to the north and east. An ephemeral creek (drainage ditch) originating in the Gabilan mountains to the south, enters the parcel between the two fields, outside of the school campus fence, north of the project site.

The proposed project will demolish the existing structures on the approximately 5.18 acres of the 12-acre school site and reconstruct new classrooms and school facilities The project would remove eight single story buildings and existing asphalt paving, and replace them with 15 modular classrooms, two modular restroom utility pods, one modular library/maker space, one administration building, one multipurpose/food service building, pedestrian hardscapes, landscaping, parking, and one driveway drop-off area. Areas outside of the project footprint include a large on campus field, parking, and three existing buildings. This school campus area is enclosed by a chain link fence. The entire school parcel includes an additional soccer field outside of the campus fence to the north.

Plant and Wildlife Habitats

Vegetation around the project site, located within the fence, include a field and small landscape areas. The field is entirely ruderal and dominated by non-native grasses and weedy species including non-native annual grasses, black mustard (*Brassica nigra*), rose clover (*Trifolium hirtum*), white horehound (*Marrubium vulgare*), purple starthistle (*Centaurea calcitrapa*), plantain (*Plantago* sp.), Bermuda grass (*Cunodon dactylon*), curly dock (*Rumex crispus*), tobacco tree (*Nicotiana glauca*), etc., with occasional occurrences of native western vervain (*Verbena lasiostachys var. lasiostachys*).

Vegetation in landscaped areas around the campus include numerous native and nonnative shrubs and trees. Hedges, small plants, and shrubs around the project site include non-native species (cotoneaster (*Cotoneaster* sp.), Indian hawthorn (*Rhaphiolepsis indica*), creeping juniper (*Juniperus horizontalis*), heavenly bamboo (*Nandina domestica*), rosemary (*Salvia Rosmarinus*), non-native salvia (*Salvia* sp.), geranium (*Geranium* sp.), roses (*Rosa* spp.), and non-native blackberry (*Rubus* spp.). Trees include nonnative (cypress (*Cupressus* sp.), pine (*Pinus* sp.) olive (*Olea* sp.), Peruvian pepper tree (*Schinus mole*), Chinese hackberry (*Celtis sinensis*), maple (*Acer* sp.), birch (*Betula* sp.), magnolia (*Magnolia* sp.) and native (oaks (*Quercus* sp.), willows (*Salix* sp.), madrone (*Arbutus* sp.) individuals.

There is potential for nesting birds in most vegetation, as well as in and adjacent to buildings, under the eaves of the tiled roof, and on top of the wooden support beams under the roof lines.

Within the onsite trees, there is potential for foliage roosting bats and limited potential for bark roosting bats. There is also potential for bats to roost in cracks under the eaves and in open spaces at the edge of the tiled roof line. The blue hangar storage area on the east side has potential for bat roosts at all four corners of the metal roof and under the roof line, within openings in the walls, and in adjacent sheds.

There are numerous ground squirrel burrows and pocket gopher/small mammal burrows throughout campus, on the edges of the proposed staging areas, and throughout the field area. Many burrows are going under sidewalks. Ground squirrels were observed in all of these areas, at their burrows, or running around.

Riparian vegetation and wetlands occur outside of the fenced campus. Vegetation along the creek/drainage includes California walnut (*Juglans californica*), Cottonwood (*Populus* sp.), blackberry (*Rubus* sp.), and willows (*Salix* sp.). The neighboring property to the east of the Project has tall vegetation that includes, nonnative grasses, Peruvian pepper trees (*Schinus mole)*, pine trees (*Pinus* sp.), Arundo (*Arundo donax*), coyote brush (*Baccharis pilularis*), prickly pear (*Opuntia* sp.), willows (*Salix* sp.), walnut trees (*Juglans* sp.), native oak trees (*Quercus* sp.), and redwood trees (*Sequoia sempervirens*). These areas provide habitat for nesting birds, bats, amphibians, reptiles, etc.

Wildlife observed while on the project site included American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), Bewick's wren (*Thryomanes bewickii*), black phoebe (*Sayornis nigricans*), house finch (*Haemorhous mexicanus*), killdeer (*Charadrius vociferus*), red tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), ruby crowned kinglet *(Corthylio calendula*), Coast range lizard (*Sceloporus occidentalis bocourtii*), Sierra tree frog *(Pseudacris sierra),* California ground squirrel (*Spermophilus beecheyi*), and Eastern fox squirrel (*Sciurus niger*), etc.

Aquatic/Wetland. There were no wetland or aquatic features on the project site. A creek originating in the Gabilan mountains runs through the City of San Juan Bautista and continues east, north of the fenced campus. At the northeast corner of the campus fence, the drainage forks to run north, parallel to agricultural fields and the parcel soccer field, or continues east to terminate in a riparian wetland area. See Figure 5, National Wetland Inventory Map.

a. **Special-Status Species**. A search of the California Department of Fish and Wildlife *California Natural Diversity Database* (CNDDB) was conducted for the site and the surrounding eight U.S. Geological Survey (USGS) quadrangles in order to generate a list of potentially occurring special-status species for the project vicinity. Records of occurrences for special-status plants were reviewed for those quadrangles in the CNPS *Inventory of Rare and Endangered Plants of California* (CNPS 2023). A USFWS *Endangered Species Program* threatened and endangered species list was also generated for San Benito County, and the USFWS *Critical Habitat for Threatened & Endangered Species* online mapper was reviewed (USFWS 2023a & USCWS 2023b). Special-status species in this report are those listed as Endangered, Threatened, or Rare or as candidates for listing by the USFWS and/or CDFW; as Species of Special Concern or Fully Protected species by the

CDFW; or as Rare Plant Rank 1B or 2B species by CNPS. Appendix B, Special-Status Species with Potential to Occur in the Project Vicinity, presents tables with special-status species search results, which lists the special-status species documented within the project vicinity, their listing status, suitable habitat description, and their potential to occur on the project site. Figure 6, Special-Status Species in the Project Vicinity, presents a map of the CNDDB results.

Special-Status Plant Species. No special-status plants were observed during the biological survey. Suitable habitat for special-status plant species recorded as occurring in the vicinity of the project site was not found at the project site.

Special-Status Wildlife Species. Special-status wildlife species with low potential to occur on the project site include California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), and burrowing owl (*Athene cunicularia*). Nesting birds and roosting bats may also occur on the project site. These species are addressed below.

California Tiger Salamander. The federally and state-listed threatened California tiger salamander (*Ambystoma californiense*) is a large terrestrial salamander. It occurs in central California from the Sacramento Valley to the south-central San Joaquin Valley, and in the surrounding foothills of both the Coast Ranges and the Sierra Nevada Mountains. California tiger salamanders are also recorded from the San Francisco Bay region, Sonoma County, the Monterey Bay region, and the valleys and foothills of San Luis Obispo and Santa Barbara counties. California tiger salamanders breed in temporary wetland pools, such as vernal pools, and other seasonal wetland bodies where ponded water is present for a minimum of three to four months, extending into the early spring. Such ponds and temporary wetlands provide necessary breeding and larval-stage habitat for the species. Adults spend most of the year in aestivation, underground in the burrows of small mammals, such as the California ground squirrel and/or Botta's pocket gopher (*Thomomys bottae*), or within other suitable subterranean retreats.

CNDDB records indicate that the closest known occurrence of California tiger salamander to the project site was recorded in 1991, north of State Route 156, 1.1 miles northwest of the site (Occurrence No. 258, CNDDB 2023). The next closest record is 1.9 miles northwest recorded in 2013 (Occurrence No. 1125, CNDDB 2023a). There are no seasonal ponds present in the immediate vicinity of the project, and multiple barriers such as development and roads are located west of the property. There are several ponds to the north, west, and south of the property (0.9, 1.15, and 0.6 miles respectively). These ponds may provide breeding opportunities for California tiger salamander. Although the project lies on the limits of California tiger salamander migration range, the adjacent school field with many small mammal burrows make the site a low potential habitat for estivating California tiger salamander. If present, the proposed project has the potential to result in impacts to California tiger salamander, and impacts to the species are considered significant. Implementation of mitigation measures BIO-1 and BIO-2 would reduce this potential, significant impact to California tiger salamander to a less-than-significant level.

Figure 5

National Wetland Inventory and Vegetation

San Juan School Reconstruction Initial Study

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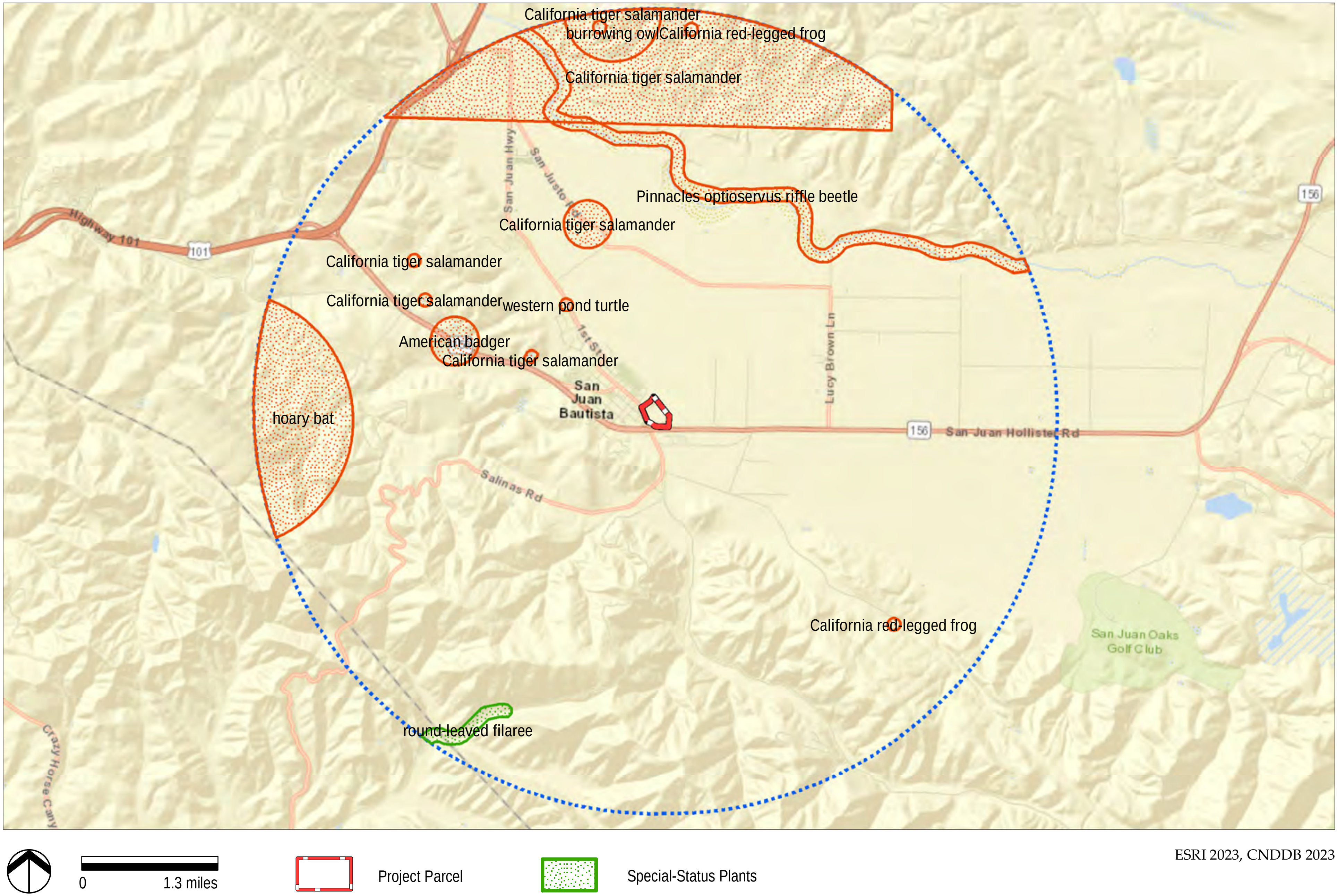

ESRI 2023, CNDDB 2023

Figure 6

Special-Status Species in the Project Vicinity

San Juan School Reconstruction Initial Study

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California Red-legged Frog. A federally-listed Threatened species and California Species of Special Concern, California red-legged frog occurs in lowlands and foothills primarily in perennial or ephemeral ponds, pools, and streams where water remains long enough (14-28 weeks) for breeding and metamorphosis of tadpoles. Specific breeding sites include streams, creeks, ponds, marshes, sag ponds, deep pools, backwater areas, dune ponds, lagoons, and estuaries. California red-legged frog may disperse from their aquatic breeding habitats to upland habitats during the dry season. They prefer upland habitats that provide moisture to prevent desiccation and protection from predators, including downed logs, woody vegetation, boulders, moist leaf litter, or other refugia during the dry season. In areas where upland habitats do not contain structure, they take refuge in burrows. However, if there is sufficient water at their breeding location, they may remain in aquatic habitats year-round instead of moving to adjacent uplands.

During wet seasons, frogs can move long distances between habitats, traversing upland areas or ephemeral drainages. Dispersal distances are typically less than 0.3 mile, with a few individuals moving 1.2-2.2 miles. Seeps and springs in open grasslands can function as foraging habitat or refugia for wandering frogs.

CNDDB records indicate that the closest known occurrence of California red-legged frog to the project site was recorded in 2001, within an agricultural pond 2.3 miles southeast of the site (Occurrence No. 433, CNDDB 2023a). No aquatic habitat was observed at the project site the time of the site survey. However, the project site is in close proximity to an ephemeral drainage with good upland habitat for dispersal. Based on the occurrence documented in the project vicinity, and proximity to potential breeding and migratory habitat, there is potential for California red-legged frogs to exist within the project site. If present, the proposed project has a potential to result in impacts to California red-legged frog, and impacts to the species are considered significant. Implementation of mitigation measures BIO-1 and BIO-2 would reduce this potential, significant impact to California red-legged frog to a less-than-significant level.

Mitigation Measures

BIO-1 California tiger salamander and California red-legged frog have been recorded in close proximity to the project site. The school district will obtain Incidental Take Permits from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) for potential project impacts to California tiger salamander and California red-legged frog and implement all avoidance, minimization, and compensatory mitigation measures required by these permits.

Take permit conditions may include, but not be limited to, the following avoidance and minimization measures identified below to minimize the potential for "take" of California tiger salamander and California red-legged frog:

a. At least 15 days prior to ground disturbance, the biologist shall submit the name and credentials of the project biologists who would conduct activities specified in this measure. No project activities shall begin until the biologist has received written approval from the USFWS and CDFW that the biologists are qualified to conduct the work.

b. The qualified biologist shall conduct preconstruction surveys for California red-legged frog and California tiger salamander no more than two weeks (14 days) prior to the start of construction activities. The project site will be surveyed for potential migratory and/or upland activity. The qualified biologist shall prepare a report documenting the results of the preconstruction surveys for submittal to the school district prior to ground disturbance.

c. Biologists shall have the authority to halt construction work at any time to prevent harm to California tiger salamander and California red-legged frog or when any of the permit-specified protection measures have been violated. Work shall re-commence only when authorized by the biologists. If work is stopped due to potential harm to protected species, the project biologists shall contact the USFWS and/or CDFW by telephone or email on the same day to communicate the event and coordinate appropriate action.

d. Biologists shall conduct biological construction monitoring for California tiger salamander and California red-legged frog during ground-disturbing activities. Before the start of work each day, a biologist or their designee shall check for wildlife under any equipment such as vehicles and stored pipes within active construction zones. A biologist or their designee shall also check all excavated steep-walled holes or trenches greater than one foot deep for trapped animals. If California tiger salamander or California red-legged frog is observed within an active construction zone, a biologist shall be notified immediately and all work within 100 feet of the individual animal shall be halted and all equipment turned off until the biologist has captured and removed the individual from the work area. Individuals shall be relocated to a USFWS/CDFW-approved off-site location according to permit specifications.

e. Offsite habitat mitigation. Offsite habitat shall be procured at an appropriate ratio of project site impact area to compensation habitat area, as determined in coordination with USFWS and/or CDFW. Offsite mitigation may include purchasing credits at a mitigation bank or permanent protection of land with established aquatic and upland habitat or sites with known upland habitat where the creation of a pond may enhance the habitat value of the site.

BIO-2 Prior to ground disturbance, the school district shall hire a qualified biologist to conduct a training session for all construction personnel. At a minimum, the training shall include a description of special-status species potentially occurring in the project vicinity, including, but not limited to, California tiger salamander, California red-legged frog, burrowing owl, special-status bats, and nesting birds and raptors. Their habitats, general measures that are being implemented to conserve species as they relate to the project, and the boundaries within which construction activities will occur will be explained. Informational handouts with photographs clearly illustrating the species' appearances shall be used in the training session. All new construction personnel shall undergo this mandatory environmental awareness training.

The qualified biologist shall provide documented evidence of completion of this training to the school district prior to ground disturbance.

Burrowing Owl. Burrowing owl (*Athene cunicularia*) is a California Species of Special Concern. Burrowing owls live and breed in burrows in the ground, especially in abandoned California ground squirrel burrows. Optimal habitat conditions include large open, dry and nearly level grasslands or prairies with short to moderate vegetation height and cover, areas of bare ground, and populations of burrowing mammals. This species has been observed approximately 2.7 miles southwest of the project site (Occurrence No. 435, CNDDB 2023a). The project site's ruderal grassland area (playfields immediately west of the existing hardscape school facilities) with many small mammal burrows provides marginally suitable nesting habitat for burrowing owl, and the surrounding agricultural area provides marginal foraging habitat. Although unlikely, if burrowing owl is present on or adjacent to the project site, construction activities could result in the loss or disturbance of individual animals. This would be a significant adverse environmental impact. Implementation of the following mitigation measures would reduce the potential impact to burrowing owl to a less-than-significant level.

Mitigation Measure

BIO-3 To avoid loss of or harm to burrowing owl, the following measures shall be implemented:

a. Prior to issuance of a grading permit, and to avoid/minimize impacts to burrowing owls potentially occurring within the project site, the school district shall retain a biologist qualified in ornithology to conduct surveys for burrowing owl. The qualified biologist shall conduct a two-visit (i.e., morning and evening) presence/absence survey at areas of suitable habitat on and adjacent to the project site boundary no less than 14 days prior to the start of construction or ground disturbance activities. Surveys shall be conducted according to the methods for take avoidance described in the Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993) and the Staff Report on Burrowing Owl Mitigation (CDFW 2012). If no burrowing owls are found, a letter report confirming absence shall be prepared and submitted to the school district and no further measures are required.

b. Because burrowing owls occupy habitat year-round, seasonal no-disturbance buffers, as outlined in the Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993) and the Staff Report on Burrowing Owl Mitigation (CDFW 2012), shall be in place around occupied habitat prior to and during any ground disturbance activities. The following table includes buffer areas based on the time of year and level of disturbance (CDFW 2012), unless a qualified biologist approved by the California Department of Fish and Wildlife verifies through non-invasive measures that either: 1) birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

Location	Time of Year	Level of Disturbance Buffers (meters)		
		Low	Med	High
Nesting Sites	April 1 – Aug 15	200 m	500 m	500 m
Nesting Sites	Aug 16 – Oct 15	200 m	200 m	500 m
Nesting Sites	Oct 16 – Mar 31	50 m	100 m	500

c. If burrowing owl is found and avoidance is not possible, burrow exclusion may be conducted by qualified biologists only during the non-breeding season, before breeding behavior is exhibited and after the burrow is confirmed empty through non-invasive methods, such as surveillance. Occupied burrows shall be replaced with artificial burrows at a ratio of one collapsed burrow to one constructed artificial burrow (1:1). Evicted burrowing owls may attempt to colonize or re-colonize an area that would be impacted, thus ongoing surveillance during project activities shall be conducted at a rate sufficient to detect burrowing owls if they return.

d. If surveys locate occupied burrows in or near construction areas, consultation with the California Department of Fish and Wildlife shall occur to interpret survey results and develop a project-specific avoidance and minimization approach. Once the absence of burrowing owl has been confirmed, a letter report shall be prepared and submitted to the school district.

Special-Status Bats. Bats were not observed during the reconnaissance-level biological field survey. However, trees in the project area and/or buildings or structures on or adjacent to the project site could provide roosting habitat for special-status bat species known to occur in the vicinity of the project site, including the California Species of Special Concern hoary bat (*Lasiurus cinereus*).

Bat species inhabit a wide variety of habitats including grasslands, woodlands, and forests. Project development and construction activities at the project site could result in the disturbance of roost and/or natal sites occupied by special-status bats on or adjacent to the project site, if present. Loss or harm to special-status bats is considered a significant adverse impact. Implementation of Mitigation Measure BIO-2, which requires all new construction personnel to undergo environmental awareness training, and the following mitigation measure will reduce the potential impact to special-status bats to a less-than-significant level.

Mitigation Measure

BIO-4 The following measures shall be implemented to avoid loss of or harm to special-status bat species:

a. Approximately 14 days prior to construction activities, a qualified biologist shall conduct a habitat assessment for bats and potential roosting sites in trees or buildings within 50 feet of the construction easement. These surveys shall include a visual inspection of potential roosting features (bats need not be present) and a search for presence of guano within the project site, construction access routes, and 50 feet around these areas. Cavities, crevices, exfoliating bark, and bark fissures that could provide suitable potential nest or roost habitat for bats shall be surveyed. Assumptions can be made on what species is present due to observed visual characteristics along with habitat use, or the bats can be identified to the species level with the use of a bat echolocation detector such as an "Anabat" unit. Potential roosting features found during the survey shall be flagged or marked.

b. If no roosting sites or bats are found, a letter report will be prepared by the biologist and submitted to the school district, where it will be kept on file, and no further measures are required.

c. If bats or roosting sites are found, bats shall not be disturbed without specific notice to and consultation with California Department of Fish and Wildlife.

d. If bats are found roosting outside of the nursery season (May 1 through October 1), California Department of Fish and Wildlife shall be consulted prior to any eviction or other action. If avoidance or postponement is not feasible, a Bat Eviction Plan will be submitted to California Department of Fish and Wildlife for written approval prior to project implementation. A request to evict bats from a roost includes details for excluding bats from the roost site and monitoring to ensure that all bats have exited the roost prior to the start of activity and are unable to re-enter the roost until activity is completed. Any bat eviction shall be timed to avoid lactation and young-rearing. If bats are found roosting during the nursery season, they shall be monitored to determine if the roost site is a maternal roost. This could occur by either visual inspection of the roost bat pups, if possible, or by monitoring the roost after the adults leave for the night to listen for bat pups. Because bat pups cannot leave the roost until they are mature enough, eviction of a maternal roost cannot occur during the nursery season. Therefore, if a maternal roost is present, a 50-foot buffer zone (or different size if determined in consultation with the California Department of Fish and Wildlife) shall be established around the roosting site within which no construction activities including tree removal or structure disturbance shall occur until after the nursery season.

Nesting Birds. Protected raptors including Cooper's hawk (*Accipter cooperii*) a species of special concern, the White-tailed kite (*Elanus leucurus*) a Fully Protected Species, and nesting bird species protected under the federal Migratory Bird Treaty Act and California Fish and Game Code, have the potential to nest in buildings or structures, on open ground, or in any type of vegetation, including trees, during the nesting bird season (January 15 through September 15). The project site contains open grassland areas suitable for open ground nesting, as well as trees. Construction activities, including ground disturbance, can impact protected bird species, should nesting birds be present during construction. If protected bird species are nesting adjacent to the project site during the bird nesting season, then noise-generating construction activities could result in the loss of fertile eggs, nestlings, or otherwise lead to the abandonment of nests.

Implementation of Mitigation Measure BIO-2, which requires all new construction personnel to undergo environmental awareness training, and the following mitigation measure would reduce the potential impact to nesting birds to a less-than-significant level.

Mitigation Measure

BIO-5 To avoid impacts to nesting birds during the nesting season (January 15 through September 15), all Phase I construction activities should be conducted between September 16 and January 14, which is outside of the bird nesting season. If construction or project-related work is scheduled during the nesting season (February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), a qualified biologist shall conduct nesting bird surveys.

a. Two surveys for active bird nests will occur within 14 days prior to start of construction, with the final survey conducted within 48 hours prior to construction. Appropriate minimum survey radii surrounding each work area are typically 250 feet for passerines, 500 feet for smaller raptors, and 1,000 feet for larger raptors. Surveys will be conducted at the appropriate times of day to observe nesting activities. Locations off the site to which access is not available may be surveyed from within the site or from public areas. If no nesting birds are found, a letter report confirming absence will be prepared and submitted to the school district and no further mitigation is required.

b. If the qualified biologist documents active nests within the project site or in nearby surrounding areas, an appropriate buffer between each nest and active construction shall be established. The buffer shall be clearly marked and maintained until the young have fledged and are foraging independently. Prior to construction, the qualified biologist shall conduct baseline monitoring of each nest to characterize "normal" bird behavior and establish a buffer distance, which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds daily during construction activities and increase the buffer if birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman shall have the authority to cease all construction work in the area until the young have fledged and the nest is no longer active. Once the absence of nesting birds has been confirmed, a letter report will be prepared and submitted to the school district.

b. **Riparian Habitat or Sensitive Natural Communities.** There are no riparian habitats or sensitive natural communities within the project site. The fenced campus is bordered immediately to the north by an ephemeral creek which drains into a forested wetland located immediately outside the northeast corner of the project site. Riparian vegetation including willows, cottonwoods, blackberry, etc., comprise both the ephemeral creek and the wetland forest vegetation.

c. **Waters of the United States**. A review of the *National Wetlands Inventory* (NWI) online database was conducted to identify potential jurisdictional aquatic features on or adjacent to the project site (USFWS 2023c). The results showed an offsite palustrine (nontidal), forested, scrub-shrub, semi permanently flooded wetland (NWI Classification Code: PFO/SSF) bordering the northeast portion of the project site and an offsite palustrine (nontidal), forested, scrub-shrub, seasonally flooded, and excavated wetland (NWI Classification Code: PFO/SSCx) bordering the north border of the project site.

Semipermanent flooded wetlands are defined by the NWI as habitat where water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

Seasonally flooded wetlands are defined by the NWI as habitat where water is present for extended periods especially early in the growing season, but absent by the end of the growing season in most years. Excavated wetlands are identified as wetland channels that were excavated by humans.

Both wetlands are offsite, therefore there are no potentially jurisdictional features on the project site.

d. **Wildlife Movement.** Wildlife movement corridors provide connectivity between habitat areas, enhancing processes like nutrient flow, gene flow, seasonal migration, pollination, and predator-prey relationships. Increasing connectivity is a critical strategy for addressing habitat loss and fragmentation, a top threat to biodiversity.

The school site is not located within any previously defined essential habitat connectivity areas as mapped by the *California Essential Habitat Connectivity Project* (CDFW 2023d). The school site is completely fenced. Movement of larger mammals between the project site and regional open space lands is likely to be restricted due to the lack of physical linkages and existing barriers (e.g., roads, developed areas). To the extent that small and fragmented patches of remnant habitats occur adjacent to the school site, such as the ephemeral drainage north of the site and the forested wetland area to the east, they have become virtual islands of habitat and provide limited opportunity for wildlife movement and exchange of genetic material. Dispersal to and from the project site by small mammals, amphibians, and reptiles is possible, but limited by fencing, school buildings and parking areas, agricultural and paved roads, residential development, and agricultural fields. Therefore, the project site does not act as a major wildlife corridor, movement pathway, or linkage between larger habitat areas for terrestrial wildlife and the proposed project would have a less-than-significant impact on wildlife movement.

e. **Local Biological Resource Policies/Ordinances.** The City of San Juan Bautista General Plan has goals in place to protect natural resources and improve environmental quality while promoting growth and development. An important objective of the conservation element is the protection of all state and federally listed special-status species and their critical habitat. Policy CO 4.1.1 states that projects will "Comply with federal and state laws regarding the protection of special-status species and habitat, as defined by US Fish and Wildlife Service," Additional goals in the conservation element call for the protection of wildlife, habitat, air quality, and water resources. This biological resources section addresses these goals.

Protected Trees. Project plans indicate approximately five native trees within the project area are slated for removal. The reconstruction plan provided by the school district does not indicate locations of replacement trees.

Direct impacts as a result of the proposed project would occur through tree removal and indirect impacts could potentially jeopardize tree health through damage to roots and paving under tree driplines, resulting in the potential need to remove the trees. Implementation of the following mitigation measure would reduce this potential, significant impact to a less-than-significant level.

Mitigation Measure

BIO-6 Prior to any ground disturbance, the school district will hire an International Society of Arboriculture (ISA)-certified arborist to conduct a tree survey and prepare an evaluation report with associated data and location map for all potentially affected native trees on and immediately adjacent to the project site. The school district will follow the arborist's recommendations, such as planting replacement trees in appropriate on-site or off-site areas, along with any required maintenance and monitoring.

f. **Conservation Plans.** There are no critical habitat boundaries, habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans applicable to the proposed project site (CDFW 2023d, USFWS 2023a).

5. CULTURAL RESOURCES

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to section 15064.5?	☐	☒	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Comments:

a, b. **Built Historic Resources.** Based on the findings of the *Phase I Cultural Resources Inventory of San Juan School, San Juan Bautista, San Benito County, California* ("Phase I Cultural Resources Evaluation") (Albion Environmental 2022a), the existing school is not considered a historic resource.

Buried Historic Resources. Based on the findings of the Phase I Cultural Resources Evaluation (Albion Environmental 2022a), and the *Phase II Cultural Resources Evaluation of SJS-1 for San Juan School, 100 Nyland Drive, San Juan Bautista, San Benito County, California* ("Phase II Cultural Resources Evaluation") (Albion Environmental 2022b), historic artifacts were encountered during testing, but were deemed not significant due to their lack of association with significant events, persons, methods, or types of construction. Site number (temporarily-designated) SJS-1 does not have research potential.

According to the Phase II Cultural Resources Evaluation report, there were no previously known cultural resources located on the project area based on a search of the NWIC. However, there is always the possibility that buried historic resources could be discovered during earth-moving activities. According to the Phase II cultural resources evaluation, ground disturbance is unlikely to impact any cultural resources if the depths of impact stay above 18 inches, as the soils above 18 inches are either construction fill or disturbed A-horizon. However, the project will likely require disturbance below 18 inches (John Dominguez, email message, September 19, 2023).

Unique Archaeological Resources. Based on the findings of the Phase II Cultural Resources Evaluation, there were no prehistoric cultural resources uncovered during testing of site SJS-1 and the NWIC records discussed in the report show that no known prehistoric resources were previously located in the project's site boundary. However, there is always the possibility that buried prehistoric resources could be discovered during earth-moving activities. A November 17, 2023 search of the Native American Heritage Commission Sacred Land File deemed the site positive. Refer to Section 18, Tribal Cultural Resources, for additional discussion.

Implementation of Mitigation Measure CR-1 would ensure that potential impacts associated with historic resources and unique archaeological resources would be less than significant.

Mitigation Measures

CR-1 The school district will hire a qualified archaeologist to monitor earth-moving activities when such activities disturb soils at least 18 inches below the surface. This mitigation will be included on all grading and construction plans.

CR-2 If any prehistoric or historic subsurface cultural resources, including tribal cultural resources, are discovered during ground-disturbing activities (including tree and vegetation removal, tree planting, demolition and/or grading):

a. All work within 50 feet of the resources shall be halted and a qualified archaeologist shall be consulted to assess the significance of the find according to CEQA Guidelines Section 15064.5.

b. Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation (DPR) forms and evaluated for significance by a qualified Archaeologist. Significant cultural resources consist of but are not limited to stone, bone, glass, ceramics, fossils, wood, or shell artifacts, or features including hearths, structural remains, or historic dumpsites.

c. All significant prehistoric cultural materials and or tribal cultural resources recovered shall be returned to Native American tribes traditionally and culturally affiliated with the area.

d. In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts to historical resources or unique archaeological resources, the lead agency shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, proposed project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) would be implemented.

e. Work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is being carried out.

c. **Native American Remains.** Although there are no formal cemeteries or Native American burial grounds known to exist at the site or in the vicinity, there is always the potential that construction activities could accidentally uncover human remains. Disturbance of Native American skeletal remains during the project's construction would be a significant, adverse environmental impact. However, implementation of the following CR-3 mitigation measure would ensure that potential impacts associated with human remains are less than significant.

Mitigation Measure

CR-3 California Health and Safety Code Section 7050.5 and the CEQA Guidelines Section 15064.5(e) contain the mandated procedures of conduct following the discovery of human remains. According to the provisions in CEQA, if human remains are encountered at the site, all work in the immediate vicinity of the discovery shall cease and necessary steps to ensure the integrity of the immediate area shall be taken. The San Benito County Coroner shall be notified immediately. The coroner shall then determine whether the remains are Native American. If the coroner determines the remains are Native American, the Coroner shall notify the Native American Heritage Commission within 24 hours, who would, in turn, notify the person the Native American Heritage Commission identifies as the Most Likely Descendant (MLD) of any human remains. Further actions shall be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the Native American Heritage Commission of the discovery. If the Most Likely Descendant does not make recommendations within 48 hours, the owner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance. Alternatively, if the owner does not accept the Most Likely Descendant's recommendations, the owner or the descendent may request mediation by the Native American Heritage Commission.

6. ENERGY

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

The following analysis identifies the major forms of the anticipated project energy demand. This analysis is qualitative, commensurate with the qualitative nature of the threshold of significance.

Comments:

a. The primary sources of energy demand will be from increased fuel use and electricity consumption during construction. Since the proposed project would not increase student capacity or number of faculty relative to existing conditions, no change in operational energy demand is assumed. However, because the project must meet more stringent current energy efficiency regulations than were in effect at the time the existing school was constructed, it is possible that operational energy demand would decline relative to existing school conditions.

During the short-term construction process, diesel and gasoline use in construction equipment, material transport vehicles, portable power generation systems, and worker vehicles would be the primary sources of energy demand. Demand for electricity would also occur.

School construction activities will be limited in intensity and duration due to the nature of the project. The construction process would be similar to common types of land development, though could be considered less energy intensive because the planned school buildings will be prefabricated. Energy demand would not be wasteful, as the project is proposed to meet a common public need.

The new school buildings must conform to the California Energy Code, Building Energy Efficiency Standards (Title 24, Part 6), which are uniformly applied to reduce energy consumption and improve energy-efficiency for residential and non-residential development (California Energy Commission 2022). As an example, all buildings must be designed to meet code requirements for reducing demand for grid-generated power by installing solar power generation and energy storage battery backup.

Given the considerations summarized above, the proposed project would have a less-than-significant impact from wasteful, inefficient, or unnecessary energy resource demand during construction.

b. The school district has not adopted a plan for renewable energy, nor is it subject to complying with renewable energy plans of other local special districts or government agencies. State renewable energy plans do not specifically require action at the local special district or government agency level.

A multitude of state regulations and legislative acts are aimed at improving energy efficiency and enhancing energy conservation. While most of the energy-related legislation is enforced at the State level, the California Building Standards Code is enforceable at the local level by the school district, specifically the Board of Education, through the project approval process and required review by the Division of the State Architect which issues a "Written Approval of Plans" letter after it reviews the project for code compliance. That enforcement is the primary mechanism through which State mandated energy efficiency/conservation measures that are within the control of the school district must be implemented. Therefore, the project will not conflict with renewable energy efficiency/conservation plans.

7. Geology and Soils

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
(1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☒	☐	☐
(2) Strong seismic ground shaking?	☐	☒	☐	☐
(3) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
(4) Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐
d. Be located on expansive soil, creating substantial direct or indirect risks to life or property?	☐	☒	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

The following analysis is largely based on the findings of two reports prepared for the school district:

- *CDE/CCR Title 5 Geologic and Environmental Safety Hazards Evaluation (geohazards evaluation)* prepared by McCloskey Consultants (dated July 11, 2023), included as Appendix C of this initial study; and

- *Updated Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation Proposed Seismic Rehabilitation of Six Existing Buildings and Construction of a New Multi-Purpose Building, San Juan School, 100 Hyland Drive, San Juan Bautista, California* prepared by Moore Twining Associates Inc. (dated September 14, 2022), included as Appendix D of this initial study.

The purpose of these studies was to identify geologic and other safety hazards associated with the project site, in general accordance with California Education Code 17212.5 for geologic studies and California Department of Education (CDE)/California Code of Regulations (CCR), Title 5, Sections 14010, et. seq. for environmental studies.

Comments:

a. **Fault Rupture**. The Alquist-Priolo Earthquake Fault Zoning Act was passed by the State of California in 1972, to mitigate earthquake hazards to human-occupied structures. Specifically, the Alquist-Priolo Act was designed to prevent construction of structures designed for human occupation on active faults having surface rupture. The California Geological Survey (CGS) has prepared a series of maps delineating established Earthquake Fault Zones under the Alquist-Priolo Act. Structures proposed for construction within an identified Earthquake Fault Zone require geologic investigation to confirm the structures will not be constructed across active faults. If an active fault is identified within a proposed project site, a setback is required. As not all faults have been identified, additional Earthquake Fault Zones may be added in the future.

Comparison of the project site location to the California Geological Survey (CGS) Earthquake Zones of Required Investigation Map indicates all of the project site is located within an identified Alquist-Priolo Earthquake Fault Zone for the San Andreas fault.

Fault rupture hazard evaluation conducted on the Subject Property in 2012 and 2020 by Moore Twining and Fugro as part of the geologic/seismic hazard investigations (Section 3.2, Appendix C) indicated major active faults occurring the north, south, west and east of the Subject Property, with the project site located within an Alquist-Priolo Earthquake Fault Zone. The 2012 fault rupture hazard evaluation report concluded that "geomorphic indicators suggestive of active faulting were not noted on or adjacent to the school site in the areas investigated" and "the potential for fault rupture on the site is considered low" (Moore Twining 2020). That statement applies to the area studied for one new building and not the entire project site.

Due to location within the Alquist-Priolo Earthquake Fault Zone, trenching for the presence of active faulting would be required for the proposed project, as the previous evaluation addressed one building only. A setback would be required if active faulting were identified to avoid new construction over an active fault. Therefore, fault rupture at the project site could result in a significant adverse environmental impact. Implementation of the following mitigation measure would ensure that the project would not result in substantial adverse effects, including the risk of loss, injury, or death.

Mitigation Measure

GEO-1 The school district will conduct surface rupture hazards studies for the proposed new construction that was not previously evaluated through fault trenching. Mitigation measures from the surface rupture hazards studies will be implemented, which may include, but not be limited to, a building setback from an active fault trace, prior to any earth-moving activities (reference page 19, McCloskey Consultants).

Seismic Ground Shaking. The project site is located approximately 160 feet from the San Andreas fault; therefore, the site would experience strong ground shaking during a seismic event. The purpose of the proposed project is to reconstruct the buildings on the project site to meet current seismic-related California Building Code safety regulations. Implementation of the following mitigation measure would ensure seismic ground shaking would not result in substantial adverse effects, including the risk of loss, injury, or death.

Mitigation Measure

GEO-2 To address the site-specific potential for geologic hazards attributable to ground shaking, the school district will conduct a review of the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website and, if ground motion hazard analysis is determined to be required, additional analysis will be conducted, seismic factors will be updated, and the 2019 CBC values will also be updated. Mitigation measures regarding site preparation and building construction shall be implemented (reference page 19, McCloskey Consultants).

Liquefaction. The sudden loss of shear strength in soil due to a rapid increase in pore water pressure, such as that caused by a seismic event, is known as liquefaction. When liquefaction occurs, soil behaves more as a liquid than a solid, threatening the stability of structures constructed on the surface. Soil conditions resulting in a high likelihood of liquefaction are low-density granular soils (sands, silts, gravels and combinations of the three) with a high groundwater table.

The CGS Earthquake Zones of Required Investigation map indicates the project site is located within an area that has not been evaluated for liquefaction. The 2022 fault rupture hazard evaluation report concluded that the site was found to have a low potential for liquefaction related hazards due to the relatively dense alluvium and the age of the alluvium encountered beneath the design groundwater level (page 6).

Landslides. The project site is relatively flat and is located in a low susceptibility zone for landslides (County of San Benito 2023). The proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

b. The project site soil is primarily Rincon Loam (RnC) with some Salinas Clay Loam (SaA) in the southeast corner of the site (County of San Benito 2023). Rincon Loam soils have an erosion hazard that is slight to moderate and Salinas Clay Loam soils have an erosion hazard that is slight to none (United States Department of Agriculture 1969 Erosion during grading and other earth-moving activities have the potential to affect adjacent properties, including the adjacent drainage feature. Off-site soil erosion is considered a potentially significant environmental effect. Implementation of the following mitigation measure would reduce this potentially significant effect to a less than significant level.

Mitigation Measure

GEO-3 Prior to initiation of any grading or land clearing activities, the school district will prepare and implement an erosion control plan indicating methods to sufficiently control runoff, erosion, and sediment movement during earth moving activities. The erosion control plan will also identify site design and post-construction treatment control measures to limit stormwater runoff and control erosion.

c. Due to the fine-grained nature of the project site soils, stabilization of the bottom of excavations may be necessary if the earthwork is conducted in wet weather conditions. Thus, special stabilization measures (i.e., placement of geotextile fabric and rock, chemical treatment, etc.) should be anticipated during earthwork for these conditions. It should be noted that stabilization by placement of geotextile fabric and rock will require additional excavation be conducted below the over-excavation depths recommended in *CDE/CCR Title 5 Geologic and Safety Hazards Evaluation*. Implementation of the following mitigation measure reduce this potential impact to a less than significant level.

Mitigation Measure

GEO-4 The school district will implement the recommendations in the *CDE/CCR Title 5 Geologic and Safety Hazards Evaluation* to ensure unstable soil, that may become unstable as a result of the proposed project, would not result in significant lateral spreading, subsidence, liquefaction, or collapse (reference page 15).

d. The primary soil within the project site is not at high risk for expansion (Rincon Loam (RnC)). However, the small portion of the project site that contains Salinas Clay Loam (SaA) soil could have some expansive properties as clay soils are more susceptible to expansion and subsequent hazards (City of San Juan Bautista 2015, p. 220).

One of the potential geotechnical hazards evaluated in the McCloskey 2022 report, is the expansion potential of the near surface soils. Over time, expansive soils will experience cyclic drying and wetting as the dry and wet seasons pass. Expansive soils experience volumetric changes (shrink/swell) as the moisture content of the clayey soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade when not designed for the anticipated expansive soil pressures. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods. Expansion potential may not manifest itself until months or years after construction. The potential for damage to slabs-on-grade and foundations supported on expansive soils can be reduced by placing non-expansive fill below slabs-on-grade and extending perimeter foundations or thickened slab edges continuously to a sufficient depth where moisture changes are limited.

In evaluation of the expansive soil potential at the site, expansion index testing was performed on representative samples of the near surface soils which are anticipated to be within the zone of influence of the planned improvements. The expansion tests were performed in accordance with ASTM D4829. The result of expansion index tests indicated that the near surface fat and lean clay soils have medium to low expansion potential. Consistent with these results, the near surface soils encountered in the area of the proposed multi-use building had a higher expansion potential than the near surface soils encountered in the area of the existing school buildings.

Based on the expansion potential of the near surface soils, this report recommends support of new slabs-on-grade on an imported, non-expansive fill to reduce the potential for excessive heave of slabs on grade. Chemical treatment (i.e., lime treatment) of the on-site soils could also be evaluated for use as a potential non-expansive fill below the slabs-on-grade. However, laboratory suitability testing, including compressive strength determinations, etc. would be required. In addition to placement of a non-expansive fill below slabs on grade, continuous thickened edges or perimeter foundations should be included in the building design to form a moisture cutoff. Implementation of the following mitigation measure would ensure impacts associated with expansive soils would be less than significant.

Mitigation Measure

GEO-5 The school district will implement the recommendations in the *CDE/CCR Title 5 Geologic and Safety Hazards Evaluation* to ensure expansive soils would not substantial direct or indirect risks to life or property (reference page 16).

e. The proposed project would connect into the existing sanitary sewer lines on the site and, therefore, would not use septic tanks or alternative wastewater disposal systems.

f. There are no known paleontological resources on the project site; however, the General Plan EIR states that there is a great potential for the discovery of fossils in the City (San Juan Bautista 2015, p. 188). Therefore, it is possible that paleontological resources could be accidentally discovered during construction activities associated with development of the project site. Directly or indirectly destroying a unique paleontological site is considered a significant, adverse environmental impact. Implementation of the following mitigation measure would ensure this potential impact would be less than significant.

Mitigation Measure

GEO-6 The following language will be included on all construction plans: "If paleontological resources are discovered during demolition and earthmoving activities, work shall stop within 100 feet of the find until a qualified paleontologist can assess if the find is unique and, if necessary, develop appropriate treatment measures."

8. GREENHOUSE GAS EMISSIONS

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

The proposed project would generate GHG emissions during construction from the operation of construction equipment and electricity use. Since the project would not result in an increase in student or faculty capacity, it is assumed that operational GHG emissions would be no greater than existing conditions and no further analysis of such emissions is required.

Comments:

a. The school district has not adopted thresholds of significance for construction- or operational-phase GHG emissions, nor has the air district or the City of San Juan Bautista, whose guidance the school district might otherwise rely upon. Lead agencies may also reference thresholds of significance supported by substantial evidence that have been adopted by other agencies. GHG emissions impact guidance developed by the Bay Area Air Quality Management District in its *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans* (Bay Area Air Quality Management District 2022) is often referenced by lead agencies in Monterey County for evaluating the significance of GHG impacts for land use projects. That guidance describes states: "There is no proposed construction-related climate impact threshold at this time. Greenhouse gas emissions from construction represent a very small portion of a project's lifetime GHG emissions. The proposed thresholds for land use projects are designed to address operational GHG emissions which represent the vast majority of project GHG emissions."

GHG emissions generated by burning fossil fuel in construction equipment, employee vehicles and materials transportation equipment, and GHG emissions from use of electricity generated by fossil fuels would be the only notable sources of GHG emissions from construction activities. As noted above, construction GHG emissions are not considered to be at issue relative to the operations of common land use projects. Consequently, the proposed project would not generate substantial GHG emissions and its GHG impact would be less than significant.

b. Neither the school district, nor the air district or the City of San Juan Bautista have adopted plans or regulations for reducing GHGs. As noted in the discussion under item "a" above, the Bay Area Air Quality Management District GHG guidance is commonly referenced by lead agencies located within the air district boundary. Because the project is solely a source of construction-phase GHG emissions, it would not conflict with the Bay Area Air Quality Management District's plan for reducing GHG emissions.

9. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land-use plan or, where such a plan has not been adopted, within two miles of a public airport or a public-use airport, result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Comments:

a. The proposed project involves the reconstruction of an existing school with the purpose of upgrading its facilities. Therefore, implementation of the project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

b. A phase one environmental site assessment (ESA) was prepared for the project (McCloskey Consultants 2023). The original buildings of the San Juan School, located on the eastern portion of the project site, reportedly were constructed in 1959. The existing maintenance barn appeared added to the school facility in the mid-1970s. The school district's transportation facility, including two fuel underground storage tanks (USTs), at least one fuel dispenser and oil containers/drums, was reportedly present on the southeastern corner of the project site from the 1970s through 1990s. Additional existing and previous school facilities were constructed in the 1990s through 2021.

At the school district's transportation facility vehicle fueling and maintenance appear to have been conducted. In addition to fuels and oil, additional vehicle fluids may have been stored/utilized on this area of the project site. Stained soil/concrete also was documented in this area in regulatory agency records.

A Chevron service station was constructed on the western edge of the project site (300 The Alameda) between the mid-1950s and mid-1960s. Dispensing fuel from three USTs and operating a waste oil UST associated with vehicle repair services, the service station remained present on the western portion of the project site through 1987. Due to a release from the gasoline USTs, the Chevron facility was opened as a leaking UST (LUST) case in 1987. Following verification soil sampling conducted for the waste oil UST and several years of groundwater monitoring around the gasoline USTs, all of which demonstrated no residual impact, regulatory case closure was granted for the Chevron LUST case in 1991.

Reportable quantities of hazardous materials are not present at the project site currently, and hazardous waste is not generated. The majority of the hazardous materials observed at the project site were stored in the maintenance barn, and included one-quart, one-gallon and five-gallon containers of assorted maintenance and janitorial materials, paint and gasoline.

Based on location of the nearest outcrop of Ultramafic rock likely containing naturally occurring asbestos (NOA) approximately 5½ miles generally north of the project site, near the confluence of the Pajaro River and Carnadero Creek, NOA may therefore be present in project site soils.

Based on the dates of construction for many of the school's structures (construction dates pre-dating 1978 for lead-based paint [LBP] and the late-1980s for asbestos-containing materials [ACM]) ban, building materials and coatings may include ACM and LBP.

One of four State radon screening tests for the zip code in which the school is located, exceeded the 4 picoCurie/Liter (pCi/L) United States EPA action level.

Information contained in the regulatory agency database search report did not reveal the presence of vicinity properties appearing likely to have significantly impacted the project site through documented releases to soil and/or groundwater.

Two Recognized Environmental Conditions (RECs) in connection with the project site were identified, as follows:

- The presence of historical/aged structures which may have impacted surrounding soil from flaking LBP, through application of pesticides/herbicides around building perimeters, and possibly PCBs from window caulking weathering; and

- A lack of documentation resulting in the potential for remaining undocumented USTs, as well as subsurface impact from the USTs if they leaked, and potential vehicle maintenance activities at the former school district transportation facility on the southeastern portion of the project site.

Evidence of one Historical REC (HREC) in connection with the project site was noted, as follows:

- The unconditional case closure with no further action required for the LUST case at the former Chevron service station on the western portion of the project site.

No Controlled RECs (CRECs) are identified (i.e. no land use restrictions).

In addition to the identified RECs and HREC, the following de minimis conditions also are identified:

- Very low-level residual total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene and xylenes (BTEX) impact may remain in soil and groundwater in the vicinity of the former USTs at the previous Chevron station. No analyses for lead appear to have been conducted. There also is the potential for pockets of low-level residual petroleum hydrocarbon impact from previous vehicle repair activities at the station. Residual concentrations, if any, are anticipated to have been further reduced in the decades since closure;

- Two monitoring wells at the previous Chevron station were not destroyed under permit, but were noted as destroyed through obstruction and during demolition of the station building. If the wells are encountered in the future, appropriate destruction under regulatory oversight is required; and

- Multiple very old containers of assorted paint were observed within a shed attached to the maintenance barn.

Finally, the following additional items are identified:

- Ultramafic rock which may contain NOA, is documented within 10 miles of the project site;

- One of four State radon tests conducted in the project site zip code documented radon above the 4 pCi/l action level;

- Based on the date of construction for many of the project site structures, building materials and coatings may include ACM and LBP; and

- Pole-mounted transformers which may have contained PCBs and leaked to soils.

The school district is currently consulting with the Department of Toxic Substances Control (DTSC) and preparing a preliminary endangerment assessment (PEA) to address the potential hazards associated with demolition and reconstruction of the school. If the PEA concludes that hazardous materials need to be removed from the project site, a removal action workplan (RAW) will be prepared, subject to review and approval by DTSC. A RAW may be required to address contamination at levels that pose a health risk to existing and/or future property users or that may be an ongoing source of contamination to the environment. Cleanup goals established in the RAW must be compatible with current and planned uses and ensure protection of human health and the environment. Contaminated sites are generally cleaned up to levels that allow for unrestricted, commercial/industrial, or recreational uses. Additionally, the school district may be required to obtain an asbestos renovation & demolition permit from the Monterey Bay Air Resources District. Therefore, the following mitigation measures are included:

Mitigation Measures

HAZ-1 Prior to any demolition and/or ground breaking activities, the school district will prepare a preliminary endangerment assessment (PEA) to determine if there are on-site hazardous materials that require removal. If the PEA concludes that that hazardous materials need to be removed from the project site, a removal action workplan (RAW) will be prepared, subject to review and approval by DTSC.

HAZ-2 Prior to any demolition and/or ground breaking activities, the school district will contact to the Monterey Bay Air Resources District to determine if an asbestos renovation & demolition permit is required. If one is required, the school district will apply for and obtain the permit, and implement any conditions of approval that may be required.

c. The proposed project involves the reconstruction of an existing school. Implementation of the project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d. The following lists were reviewed:

- Hazardous Materials Waste and Substances Sites from the Department of Toxic Substances Control EnviroStor Database (Department of Toxic Substances Control 2023);
- Leaking Underground Storage Tank Sites from the State Water Board’s GeoTracker Database (State Water Resources Board 2023);
- Solid Waste Disposal Sites Identified by Water Board with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit (California Environmental Protection Agency 2023a);
- “Active” Cease and Desist Order and Cleanup and Abatement Orders from Water Board (California Environmental Protection Agency 2023b); and

- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by the Department of Toxic Substances Control (California Environmental Protection Agency 2023c).

The project site is not located on any of these lists. The nearest leaking underground storage tank site is approximately 584 feet west of the site (State Water Resources Board 2023). Therefore, the proposed project is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would not create a significant hazard to the public or the environment.

e. The project site is not located within the vicinity of a private airstrip or an airport land-use plan or within two miles of a public airport or public-use airport. The nearest airport is the Hollister Municipal Airport located more than seven miles northeast of the site. Therefore, the proposed project would not result in a safety hazard or excessive noise for people residing or working in the project area.

f. The nearest evacuation route to the project site is State Route 156 (City of San Juan Bautista 2015, p. 146), which is located approximately 160 feet south. Therefore, the project's reconstruction of the existing school facility would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

g. According to the "California Department of Forestry and Fire Protection's Fire Hazard Severity Zone (FHSZ) Viewer," the project site is not located within a fire hazard severity zone; the nearest being high fire hazard zones located approximately 0.2 miles south of the site (CAL FIRE 2023). Therefore, implementation of the proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

10. HYDROLOGY AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(1) Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
(2) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☐	☒
(3) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
(4) Impede or redirect flood flows?	☐	☐	☐	☒
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Comments:

a. **Construction Water Quality Impacts**. Construction activities would involve soil disturbance associated with demolition, site preparation and grading activities. Delivery, handling and storage of construction materials and wastes; equipment refueling; and construction equipment use and maintenance could result in spills of oil, grease, or related pollutants. Improper handling, storage, disposal of fuels and materials or improper cleaning of machinery also are potential sources of water pollution associated with construction activities.

New development is required to meet National Pollutant Discharge Elimination System (NPDES) requirements. The NPDES permit program for storm water and construction site runoff is designed to reduce discharge of pollutants in storm water to the maximum extent practicable to protect water quality and beneficial uses of surface waters.

Additionally, the project would disturb more than one acre of soil and, therefore, coverage under the Construction General Permit for Discharges of Storm Water Associated with Construction Activity per NPDES requirements must be obtained. The Construction General Permit requires that individual developers prepare and implement a Storm Water Pollution Prevention Plan. A Storm Water Pollution Prevention Plan identifies best management practices (filters, traps, bio-filtration swales, etc.) consistent with the requirements of the NPDES. The practices are intended to reduce potential impacts on surface water by reducing the potential for sediment or other water quality contaminants to be discharged directly or indirectly into a surface water body and to ensure that urban runoff contaminants and sediment are minimized during site preparation and construction periods.

Required compliance with the NPDES requirements would ensure that applicable water quality standards are met and that water quality impacts from construction activities will be less than significant.

Post-Construction Water Quality Impacts. The proposed project would result in a decrease in the amount of impervious surface and an increase in pervious surfaces at the site compared to existing conditions (John Dominguez, email message, November 10, 2023) (Matthew Puckett, email message, November 20, 2023). Therefore, the change in surface conditions would not result in an increase in stormwater runoff relative to existing conditions. Storm water runoff would percolate through the pervious surfaces proposed on the site and be directed to a proposed new stormwater retention area in the northwest corner of the campus.

Nonetheless, the project will be designed to direct stormwater to the pervious areas of the site and excess stormwater to be directed to the existing storm drainage system on the school site as well as the playfields to the west. This practice encourages retaining stormwater on the site, which would meet the post-construction storm water management requirements of the Central Coast Regional Water Quality Control Board, whose primary objective is to ensure that land development projects reduce pollutant discharges to the maximum extent practicable and to prevent storm water discharges from causing or contributing to a violation of receiving water quality standards.

Required compliance with post-construction water quality performance standards of the Central Coast Regional Water Quality Control Board would ensure that applicable water quality standards would be met. The project's impact on post-construction water quality would be less than significant.

b. **Groundwater Supply.** Potable water is supplied to the school by the City of San Juan Bautista and landscape water is pumped from an on-site well. The City obtains water through groundwater resources (Gilroy-Hollister Groundwater Basin – North San Benito) and therefore, all of the water used at the school is groundwater. The proposed project would not increase student enrollment at the school and, therefore, would not result in an increase in the use of this water resource. The project would result in no measurable change in groundwater use compared to existing conditions. Therefore, the project would have no impacts associated with groundwater supplies.

Groundwater Recharge. The proposed project will decrease the square footage of impervious surfaces on the project site and increase pervious surfaces (John Dominguez, email message, November 10, 2023) (Matthew Puckett, email message, November 20, 2023). Therefore, runoff would drain on-site in the pervious areas and any excess would be directed to other pervious surfaces on the property, such as the playfields located adjacent to the west of the project site. Therefore, the proposed project would not interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

c. **Erosion/Siltation**. The project site soils contain slight to moderate erosion hazard risk. Erosion/siltation of soils flowing off-site and into the adjacent riparian drainage would be considered a significant adverse environmental impact. Implementation of the following mitigation measure would reduce this potential impact to a less-than-significant level.

Mitigation Measure

HWQ-1 Prior to any demolition and/or ground breaking activities, the school district will prepare an erosion/siltation control plan to ensure that soil erosion during demolition, grading, and construction activities would not flow off-site to the adjacent riparian drainage.

Flooding. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Community Panel Number 06069C0158D, dated April 16, 2009, depicts the eastern and northeastern portions of the project site within Flood Zone X. FEMA identifies Flood Zone X as an Area of Minimal Flood Hazard. The remainder of the Subject Property is mapped within a Special Flood Hazard Area (Base Flood Elevation ranging from 195 to 208 feet), subject to inundation by the 1 percent annual chance flood (McCloskey Consultants 2023). There are currently no structures placed in this area of the project site, it is currently paved for basketball courts with an existing patch of pervious surfaces in the location of the southernmost proposed basketball court. Therefore, flood flows are unobstructed under present conditions. No structures are proposed in the location of the flood hazard zone; therefore, no impacts associated with impeding or redirecting flood flows would occur.

Runoff. As stated in the previous discussion, the proposed project involves improvements on existing impervious surfaces. The proposed project would not result in an increase in impervious surfaces and, therefore, would not create or contribute to runoff water on the site, exceeding the capacity of existing storm water drainage systems.

d. San Juan Bautista is not located within the vicinity of a large body of water nor the ocean. Therefore, the project is not located within a tsunami or seiche zone and would not risk release of pollutants due to project inundation.

According to the Federal Emergency Management Agency, all proposed structures are entirely outside of a flood hazard zone. The 100-year flood zone (Zone AE) is located adjacent to the south of the project site and overlays the southernmost proposed basketball courts. Because there are no proposed structures within a flood hazard zone, no impacts associated with the release of pollutants due to project inundation would occur.

e. The project site is located within the North San Benito Subbasin of the Gilroy-Hollister Groundwater Basin. The *North San Benito Groundwater Sustainability Plan* (November 2021) was adopted and applies the best available information to describe the plan area (i.e., the North San Benito Subbasin), groundwater resources, and associated surface water resources.

The proposed project involves the reconstruction of San Juan School without increasing the physical site of the school or increasing student capacity. The amount of water used to serve the site under existing conditions will not change with implementation of the proposed project. Therefore, the proposed project would not conflict with or obstruct implementation of a sustainable groundwater management plan.

11. LAND USE AND PLANNING

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	☐	☒
b. Cause any significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Comments:

a. The project involves the reconstruction of the existing San Juan School with updated facilities. The project would not expand the existing boundary of the school campus and, therefore, does not involve physically dividing an established community.

b. The proposed project is the reconstruction of an existing school and would not conflict with the regional air quality management plan or state plans governing greenhouse gas emissions and energy use.

As discussed in Section 4.0, Biological Resources, there are no critical habitat boundaries, habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans applicable to the proposed project site. Therefore, the proposed project would not cause any significant environmental impact due to a conflict any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating effects to biological resources.

As discussed in Section 10.0, Hydrology and Water Quality, the project would not conflict with or obstruct implementation of the *North San Benito Groundwater Sustainability Plan*.

12. MINERAL RESOURCES

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Result in loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land-use plan?	☐	☐	☐	☒

Comments:

a. According to General Plan EIR Map 4.11-1, a formally active mineral site (San Juan Diaz Pit) was previously located at the project site but has been closed for several decades (Google Earth 2023). Therefore, implementation of the project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

b. There are no existing mineral resources within the city limits or sphere of influence. Therefore, implementation of the project would not result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land-use plan.

13. NOISE

Would the project result in:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in applicable standards of other agencies?	☐	☒	☐	☐
b. Generation of excessive ground-borne vibration or ground borne noise levels?	☐	☒	☐	☐
c. For a project located within the vicinity of a private airstrip or an airport land-use plan or, where such a plan has not been adopted, within two miles of a public airport or public-use airport, expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Comments:

a. **Temporary Noise Impacts**. The project site is located in a generally rural area, with few sensitive noise receptors. Refer to Figure 2, Aerial Photograph. One home, the closest, is located approximately 210 feet to the east. Several homes are located approximately 320 feet and further, south across State Route 156. Residential neighborhoods are located approximately 630 feet to the west toward the city center area.

Implementation of the project would result in the demolition of the existing structures and removal of trees on the site and construction of new classrooms, buildings, basketball courts, and planting new trees. These development activities could result in a substantial temporary increase in ambient noise levels in the vicinity of the project. The City of San Juan Bautista General Plan Policy N 1.4.1 indicates that construction should be limited to daylight hours in order to minimize noise impacts. Implementation of the following mitigation measure, which restricts construction activities timing, would ensure that the temporary increase in ambient noise levels in the vicinity of the project would be less than significant.

Mitigation Measure

N-1 The school district will include the following language on all demolition and construction documents. "Demolition and construction activities shall be limited to daylight hours and all construction equipment shall be properly muffled and maintained to further reduce noise generation."

Permanent. The proposed project would not change the use of the site as a school facility and would not increase the school's student enrollment. It is not anticipated that additional vehicles would access the site. Therefore, the noise levels associated with existing conditions would not change as a result of the proposed project and there would be no permanent increase in ambient noise levels in the vicinity of the project.

b. Construction of the proposed project involves demolition of existing structures, removal of trees, and the construction of new buildings. These activities may require construction equipment that could generate short-term ground-borne vibration or ground borne noise levels. Implementation of Mitigation Measure N-1 would reduce impacts associated with construction-related ground-borne vibration or ground borne noise levels to a less-than-significant level.

c. The project site is not located within the vicinity of a private airstrip or an airport land-use plan or within two miles of a public airport or public-use airport. The nearest airport is the Hollister Municipal Airport located more than seven miles northeast of the site. Therefore, the proposed project would not expose people at the project site to excessive noise levels associated with airports.

14. POPULATION AND HOUSING

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Comments:

a, b. The proposed project involves the reconstruction of San Juan School, which would not involve an increase in population, either directly or indirectly. Additionally, reconstruction of the school does not involve the displacement of any people or housing, necessitating the construction of replacement housing elsewhere.

15. PUBLIC SERVICES

Would the project result in substantial adverse physical impacts associated with the provision of or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	☐	☐	☐	☒
b. Police protection?	☐	☐	☐	☒
c. Schools?	☐	☐	☐	☒
d. Parks?	☐	☐	☐	☒
e. Other public facilities?	☐	☐	☐	☒

Comments:

a, b. The project involves the reconstruction of San Juan School, which would not expand the existing school campus boundary nor would it increase the school's enrollment capacity. The San Juan Bautista Fire Department and the San Benito County Sheriff's Office both currently serve the school and would continue to serve the school after reconstruction. The proposed project would not result in the need to construct fire or police facilities.

c. The project would result in more structurally sound classrooms and buildings and not increase the school's enrollment capacity; therefore, implementation of the project would not adversely impact schools within the school district and would result in a beneficial impact on San Juan School.

d, e. As previously mentioned, the project does not involve an increase in the school's enrollment capacity and would not result in an expansion of the existing school boundaries onto the existing play fields. The project would also result in the construction of additional basketball courts for the students. Therefore, with the existing play fields and new basketball courts, the project would not result in substantial adverse physical impacts associated with the provision of or need for new or physically altered parks or other public facilities.

16. RECREATION

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

Comments:

a. The proposed project involves the reconstruction of San Juan School without increasing the school's student capacity and includes the construction of an additional basketball court. The students attending the school, as well as nearby residents, would continue to utilize the existing play fields and the new basketball court. Therefore, the project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

b. The proposed project involves one new basketball court, the construction of which could have an adverse physical effect on the environment. However, the adverse effects that could occur with construction of a concrete basketball court are discussed throughout this initial study for the project as a whole. Therefore, the regulations, policies, and/or mitigation measures identified herein would reduce any potential impacts to a less than significant level.

17. TRANSPORTATION

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b. Conflict or be inconsistent with CEQA guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d. Result in inadequate emergency access?	☐	☐	☐	☒

Comments:

a. The proposed project involves the reconstruction of the existing San Juan School campus without any changes to the City's transit, roadway, or bicycle facilities. The proposed project involves changes to the sidewalk on the southern end of the project site (near the proposed administration building, multipurpose room, and the K1 and K2 classrooms). These proposed changes to the existing pedestrian facility on the site would be required to comply with the most recent California Building Code. Therefore, the project's compliance with the California Building Code would ensure that the project would not conflict with a program, plan, ordinance, or policy addressing pedestrian facilities.

b. The proposed project does not involve a change in vehicle trips compared to existing conditions. The project involves only the reconstruction of existing structures on the school campus, and therefore, would not result in an increase in vehicle miles traveled. The proposed project would not conflict or be inconsistent with CEQA guidelines section 15064.3, subdivision (b).

c. The proposed project involves the reconstruction of structures on the existing school campus without changing the existing roadways or parking areas. Therefore, the project would not increase hazards due to a geometric design feature or incompatible use.

d. The proposed project involves the reconstruction of the existing San Juan School buildings without changing any entrances or exits to the campus. Therefore, the proposed project would not result in inadequate emergency access.

18. TRIBAL CULTURAL RESOURCES

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
(1) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources code section 5020.1(k), or	☐	☐	☐	☒
(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

Comments:

a. The school district sent out consultation offer letters to the Native American Heritage Commission's list of Native American Tribes affiliated with the project area, including the Amah Mutsun Tribal Band, the Indian Canyon Mutsun Band of Costanoan, Wuksachi Indian Tribe/Eshom Valley Band, and the Amah Mutsun Tribal Band of Mission San Juan Bautista, on December 12, 2023. As of January 31, 2024, no requests for consultation have been received.

19. Utilities and Service Systems

Would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, single-dry and multiple- dry years?	☐	☐	☐	☒
c. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Comments:

a. The proposed project will demolish the existing structures on the site and reconstruct new classrooms and school facilities. These new structures would connect into the existing water, sewer, storm water drainage, electric power, natural gas, and telecommunication facilities. The project would not require or result in the relocation or construction of new or expanded utilities, the construction of which could cause significant environmental effects.

b. Potable water is supplied to the school by the City of San Juan Bautista and landscape water is pumped from an on-site well. The City obtains water through groundwater resources (Gilroy-Hollister Groundwater Basin – North San Benito) and therefore, all of the water used at the school is groundwater. The proposed project would not increase student enrollment at the school and, therefore, would not result in an increase in the use of this water resource. Therefore, the project would have no impacts associated with the availability of water supplies to serve the project and reasonably foreseeable future development during normal, single-dry, and multiple-dry years.

c. The City of San Juan Bautista provides wastewater conveyance and treatment. The proposed project would not increase student enrollment at the school and, therefore, would not result in an increase in the generation of wastewater. The project would result in no change in the generation of wastewater compared to existing conditions. Therefore, the project would have no impacts associated with the City's wastewater conveyance and treatment system and its ability to serve the site.

d, e. The project site's solid waste is managed by the San Benito County Integrated Waste Management Department and is sent to the John Smith Road Landfill. Other than waste that may occur with demolition and construction activities, the proposed project would not increase or change the amount of solid waste generated on the site under existing conditions nor would it impact compliance with federal, state, and local management and reduction statutes and regulations related to solid waste. Therefore, the proposed project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goal.

20. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?	☐	☐	☐	☒
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

Comments:

a-d. According to the California Department of Forestry and Fire Protection's "Fire Hazard Severity Zone (FHSZ) Viewer," the project site is not located in or near a state responsibility area or lands classified as very high fire hazard severity zones (CAL FIRE 2023). Therefore, no further response is required.

21. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Measures Incorporated	Less-Than-Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☐	☒
c. Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Comments:

a. The proposed project has a low potential to have an effect on two protected wildlife species: California tiger salamander and California red-legged frog. Mitigation measures presented in Section 4, Biological Resources, would ensure that the proposed project would not have the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

The proposed project has the potential to result in adverse effects to unknown, buried historic resources or unique archaeological resources. Mitigation measures presented in Section 5, Cultural Resources, and in Section 18, Tribal Cultural Resources, would ensure that such an impact, if it were to occur, would not be significant and would not eliminate important examples of the major periods of California history or prehistory.

b. The proposed project is the reconstruction of an existing school and would not have impacts that are individually limited, but cumulatively considerable.

c. Demolition and construction activities have the potential to result in environmental effects associated with the release of hazardous materials into the environment. Mitigation measures in Section 9, Hazards and Hazardous Materials, would ensure that such impacts would not cause substantial adverse effects on human beings, either directly or indirectly.

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San Juan School Campus Upgrades Project

A

APPENDIX

Request to Prequalify and for Qualifications and Proposals for Modular Building Preconstruction and Construction Services

SAN JUAN SCHOOL CAMPUS UPGRADES PROJECT

RESPONSES DUE:
DECEMBER 11, 2023 @ 2:00 p.m.

Schematic Site Masterplan

3 Project Description

Introduction & Intent

The intent of this Request for Qualifications/Proposals is to allow the contractor/manufacturer to acknowledge the program, yet have the flexibility, to fit the programmed spaces within their "kit of parts". Space adjacencies, sizes and furnishings, etc. should be considered as outlined in the floor plans and matrices provided herein. Minor adjustments to the floor plans will be considered and flushed out through the design process.

Exterior Envelope: Exterior finishes should maintain the intended Contemporary aesthetic. Exterior finishes should be as allowed for by the California Building Code and what is cost effective, yet aesthetically pleasing. The contractor/manufacturer shall work with the Architect of Record to develop the exterior envelope system. The exterior envelope shall conform to the requirements of the CBC Cal Green Code for energy efficiency. However the contractor/manufacturer will provide the owner with required documents to meet the requirements for submittal to DSA, including but not limited to energy modeling and calculations, daylighting modeling, exterior envelope calculations, etc. All buildings must be designed to meet code requirements for solar and battery backup.

Materials that may be used for the exterior should clearly maintain the overall Contemporary aesthetic, and include a combination of the following:
- Cementitious plaster (stucco)
- Minimum of (3) colors will be used throughout the site - Up to (3) per building

Other exterior materials/finishes may also include:
- Aluminum window systems
- Entry canopy at all main entrances to meet CalGreen requirement.
- Soffit-Vented fibre cement board
- Hose bib - (2) per main building, (1) per multi compartment Restroom and Janitor Room

Systems: The contractor/manufacturer shall present to the District cost efficient systems as outlined herein, including HVAC and ventilation systems. The contractor/manufacturer shall work with the Architect of Record and their consultants for the fire alarm, data, telecom, and audio visual systems. If providing a PC solution, the modular contractor shall make the architect aware of any code related provisions that would alter the current site layout.

Cost: The presenting contractor/manufacturer should present a detailed budget to the owner for consideration. This budget should include the buildings as outlined herein, including foundation, and all utilities within 5 feet of the buildings. All final connections will be provided by the building manufacturer/contractor. The project will also include sitework which is not part of this proposal. Concrete housekeeping pads associated with condensing unit or HVAC units, or other building elements that are required to complete the structural, fire-life safety, ADA or MEP's systems should be included. Concrete flatwork up to the edge of building at ground level should be included. The building pad will be created and certified by the general contractor.

The budget should also present unit cost for items such as flooring, tile work, ceilings, such that the owner and architect may select from listed items during design phase for implementation into the project. Alternate pricing shall be provided as outlined.

Project Description

The existing San Juan School campus is owned by the Aromas-San Juan USD and consists of approximately 12 acres. The Site consists of several single-story buildings that will be reconfigured into a new campus for the existing school. Replacement buildings will consist of 15 modular classrooms with 2 modular restroom utility pods and 1 modular Library/Makespace. See site and floor plans.

New construction will also include Administration building, Multipurpose, Food Service, the addition of a pedestrian hardscape, landscaping, staff parking, drop off facilities along the south side of the school, and new on-site utilities not in the Modular contractor's scope.

The Space Matrix and room data sheets in Section 8 list square footage, finish, and equipment requirements. These are a minimum. Also, the layout and configuration of the spaces can be creatively manipulated by the contractor/manufacturer provided the buildings stay within the square footages allotted, and do not encroach within 20’-0” minimum of any other proposed structures.

Schematic Classroom Pod Perspective

4 Site + Context

Schematic Site Demolition Plan **Existing Buildings to be Demolished**

Existing Site

100 Nyland Drive
San Juan Bautista,
California, 95045

The campus replacement will take place over the existing asphalt paving area, and the loction of the existing buildings to be demolished. The school site is in San Juan Bautista, California. See adjacent demo site plan for the buildings that will be demolished.

All portable classrooms that are salvageable shall be salvaged and returned to the district.

Construction shall commence on June 1, 2024.

Existing Site Aerial

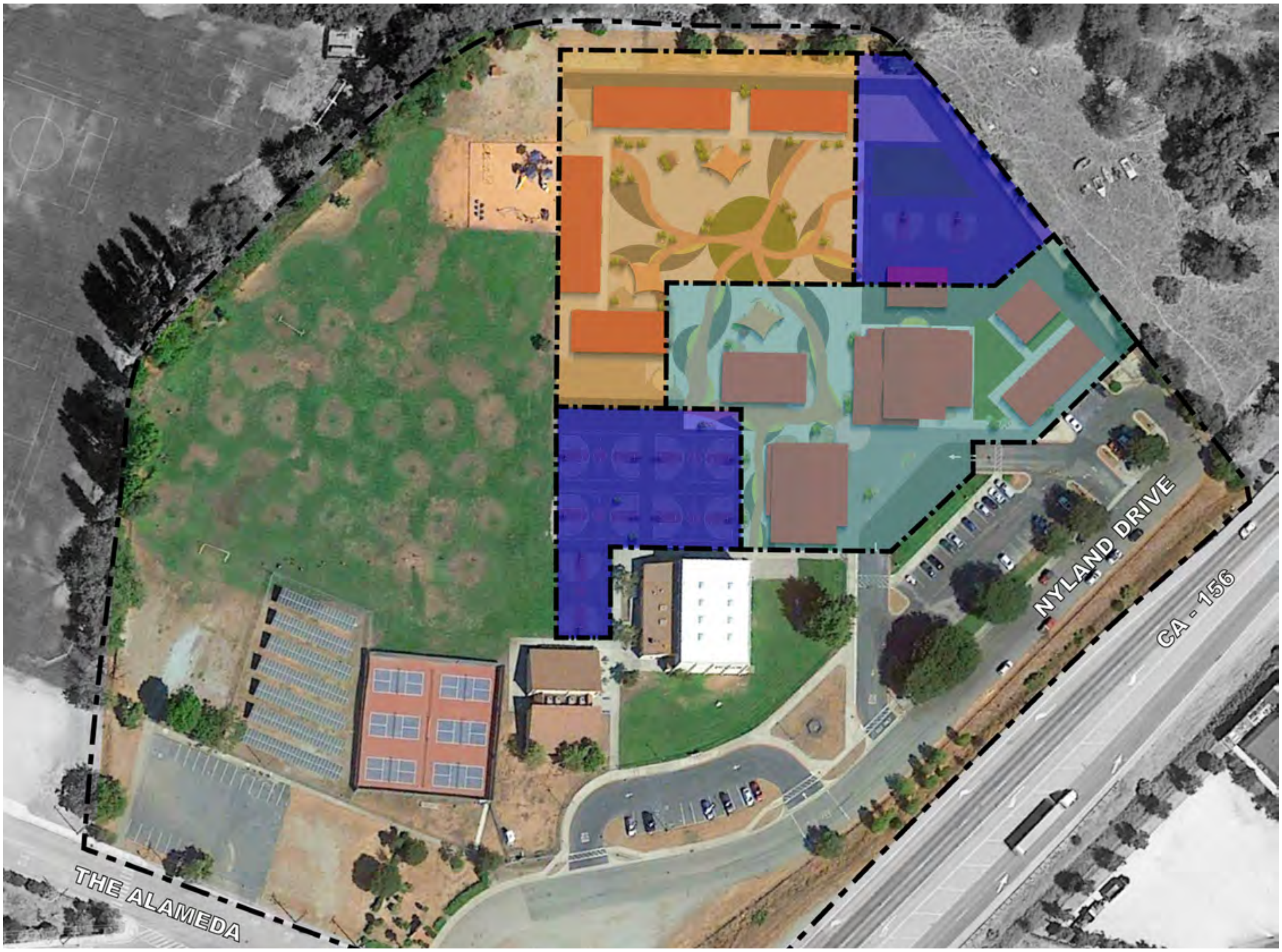
Existing Classroom Buildings & Courtyard

5 Phasing Plan - Demo

Schematic Phasing Plan

- Phase 1: Demo Existing Site and Construction of New Classroom Pods, Sitework, and temporary Admin and MDF Facilities (6/24 - 8/25)
- Phase 2: Demo Existing Site and Buildings, and Construction of New MPR, Admin Bldg and Kinder/TK Pods (6/25 - 8/26)
- Phase 3: Demo Existing Site and Construction of New Sitework (6/26 - 8/26)

6 Phasing Plan - New Construction



Schematic Phasing Plan

- Phase 1: Demo Existing Site and Construction of New Classroom Pods, Sitework, and temporary Admin and MDF Facilities (6/24 - 8/25)
- Phase 2: Demo Existing Site and Buildings, and Construction of New MPR, Admin Bldg and Kinder/TK Pods (6/25 - 8/26)
- Phase 3: Demo Existing Site and Construction of New Sitework (6/26 - 8/26)

7 New Site Plan

Modular Classroom Building

Modular Restrooms / Utilities

Modular Library / Makerspace

MPR / Food Service

Admin

Modular Classroom Building
Modular Restrooms / Utilities
Modular Library / Makerspace
MPR / Food Service
Admin

8 Program Description: Space Matrices

Programming

The new campus shall have a total of 15 new classrooms, 3 of these classrooms will be used for TK and Kindergarten and will have their own restrooms. There will also be 2 restroom utility pods that will be part of the structures. The total modular construction will be 20,256 gross square feet. The majority of the classroom buildings will be either a 4 classroom configuration or a 2 classroom configuration with a 24' x 32' restroom pod. The restroom pod will include 4 Boys and Girls fixtures, 2 all gender restrooms (1 for students and 1 for staff), an Electrical/IDF room, and a janitor closet. There are likely to be a few specialized spaces. 2 Special Education classrooms and 1 modular Library / Makerspace will likely have a non-typical layout.

These buildings were designed using a standard 10' x 32' module, 12' x 32' restroom module. Refer to space matrices for more information on the layout of classroom wings.

Specific programming requirements, as noted in the space matrices that follow. Consult District standards with all products listed. Options that differ from District standard are site specific requirements.

Safety and security is of the upmost importance to the district. Modular contractor will be required to provide pathways to locations to mount video cameras on the building.

Modular contractor shall provide exterior lighting on the building to maintain code required egress lighting. Minimum 2 hose bib per 4 classroom cluster.

Modular contractor shall provide and assist with the development and facilitation of a temporary Admin facility and connection to an associated Main Distribution Frame (MDF) to service Phase 1 at turnover. This will be utilized to operate the Phase 1 portion of the project until the permanent admin and MDF infrastructure is complete.

The new campus shall have a new Admin and MPR and all new sitework that is not in the modular contractor's scope.

Exterior Envelope

The Contractor/Manufacturer shall work with the Architect of Record to develop the exterior envelope system. While there is flexibility within the specific products specifications, the Architect of Record's design intent must be maintained.

Special-Status Species with Potential to Occur in the Project Vicinity

B

APPENDIX

Appendix A Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

Species	Status (Federal/State)	Suitable Habitat Description	Potential to Occur on Project Site
American badger *(Taxidea taxus)*	--/SSC	Most abundant in drier, open stages of most shrub, forest, and herbaceous habitats. Need sufficient food and open, uncultivated ground with friable soils to dig burrows. Prey on burrowing rodents.	Unlikely. Suitable habitat not found at the project site.
Bank swallow *(Riparia riparia)*	--/ST	Highly colonial species that nests in alluvial soils along rivers, streams, lakes, and ocean coasts. Nesting colonies only occur in vertical banks or bluffs of friable soils at least one meter tall, suitable for burrowing with some predator deterrence values. Breeding colony present in Salinas River.	Unlikely. Suitable habitat not found at the project site.
Big-eared kangaroo rat *(Dipodomys venustus elephantinus)*	--/SSC	Chaparral-covered slopes of the southern part of the Gabilan Range, in the vicinity of the Pinnacles. Forages under shrubs and in the open. Burrows for cover and for nesting.	Unlikely. Suitable habitat not found at the project site.
Blunt-nosed leopard lizard *(Gambelia sila)*	FE/SE	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts.	Unlikely. Suitable habitat not found at the project site
Burrowing owl *(Athene cunicularia)*	--/SSC	Open, dry, annual or perennial grasslands, desert, or scrubland, with available small mammal burrows.	Low potential. Adjacent school playfield includes small mammal burrows. Species known to occur within 2.7 miles of the project site.
California brackishwater snail *(mimic tryonia)* *(Tryonia imitator)*	--/SSC	Aquatic, found on rocks and in gravel of riffles in cool, swift, clear streams.	Unlikely. Suitable habitat not found at the project site.
California condor *(Gymnogyps californianus)*	FE/SE	Requires vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Deep canyons containing clefts in the rocky walls provide nesting sites. Forages up to 100 miles from roost/nest.	Unlikely. Suitable habitat not found at the project site.
California giant salamander *(Anodonta californiensis)*	--/SSC	Known from wet coastal forests near streams ad seeps from Mendocino County south to Monterey County and east to Napa County. Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	Unlikely. Suitable habitat not found at the project site.
California horned lark *(Eremophila alpestris actia)*	--/SSC	Coastal regions, chiefly from Sonoma County to San Diego County, also within the main part of the San Joaquin Valley and east to the foothills. Prefers short-grass prairie, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	Unlikely. Suitable habitat not found at the project site.
California linderiella *(Linderiella occidentalis)*	FSC/--	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools typically has very low alkalinity, conductivity, and total dissolved solids.	Unlikely. Suitable habitat not found at the project site.

Species	Status (Federal/State)	Suitable Habitat Description	Potential to Occur on Project Site
California red-legged frog *(Rana draytonii)*	FT/SSC	Rivers, creeks, and stock ponds with pools and overhanging vegetation. Requires dense, shrubby or emergent riparian vegetation, and prefers short riffles and pools with slow-moving, well-oxygenated water. Needs upland habitat to aestivate (remain dormant during dry months) in small mammal burrows, cracks in the soil, or moist leaf litter.	Moderate Potential. Species known to occur within 2.3 miles of the project site.
California Ridgway's rail *(Rallus obsoletus obsoletus)*	FE/SE	Found in saltwater and brackish marshes, traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	Unlikely. Suitable habitat not found at the project site.
California tiger salamander *(Ambystoma californiense)*	FT/ST	Grasslands and oak woodlands near seasonal pools and stock ponds in central and coastal California. Needs upland habitat to aestivate (remain dormant during dry months) in small mammal burrows, cracks in the soil, or moist leaf litter. Requires seasonal water sources that persist into late March for breeding habitat.	Low Potential. Species known to occur within 1.1 miles of the project site.
Coast Range newt *(Taricha torosa)*	--/SSC	Coastal drainages; lives in terrestrial habitats and can migrate over 1 km to breed in ponds, reservoirs, and slow-moving streams.	Unlikely. Suitable habitat not found at the project site.
Cooper's hawk *(Accipter cooperii)*	--/SSC	Oak or riparian woodlands.	Low Potential. Species known to occur in project vicinity.
Foothill yellow-legged frog *(Rana boylii)*	--/SSC	Partly shaded, shallow streams and riffles with rocky substrate in a variety of habitats. Requires at least some cobble-sized substrate for egg-laying and 15 weeks of available water to attain metamorphosis.	Unlikely. Suitable habitat not found at the project site.
Golden eagle *(Aquila chrysaetos)*	--/SFP	Rolling foothill mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range. Also uses large trees in open areas.	Unlikely. Suitable habitat not found at the project site.
Hoary bat *(Lasiurus cinereus)*	--/SSC	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Moderate Potential. Species known to occur within 1.1 miles of the project site.
Least Bell's vireo *(Vireo bellii pusillus)*	FE/SE	Summer resident of southern and central California in riparian habitats below 2,000 feet in elevation. Often nests in large shrubs, along margins of bushes or on twigs projecting into pathways.	Unlikely. Suitable habitat not found at the project site.
Marbled murrelet *(Brachyramphus marmoratus)*	FT/SE	Feeds near shore, and nests up to six miles inland from coast from Half Moon Bay to Santa Cruz in old-growth redwood forests, often in Douglas fir trees.	Unlikely. Suitable habitat not found at the project site.
Merlin *(Falco columbarius)*	--/SC	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grassland and deserts, farms and ranches, clumps of trees or windbreaks are required for roosting in open county.	Unlikely. Suitable habitat not found at the project site.
Monarch butterfly *(Danaus plexippus)*	--/SC	Winter roost sites. Wind protected tree groves (Eucalyptus, Monterey pine, cypress) with nectar and water sources nearby.	Unlikely. Suitable habitat not found at the project site.
Monterey dusky-footed woodrat *(Neotoma fuscipes luciana)*	--/SSC	Forest habitats of moderate canopy and moderate to dense understory, as well as in chaparral habitats. Nests constructed of grass, leaves, sticks, feathers, etc. Population may be limited by availability of nest materials.	Unlikely. Suitable habitat not found at the project site.

Species	Status (Federal/State)	Suitable Habitat Description	Potential to Occur on Project Site
Northern california legless lizard *(Anniella pulchra)*	--/SSC	Sandy or loose loamy soils under sparse vegetation, moist soils. Anniella pulchra is traditionally split into two subspecies: *A. pulchra pulchra* (silvery legless lizard) and *A. pulchra nigra* (black legless lizard), but these subspecies are typically no longer recognized.	Unlikely. Suitable habitat not found at the project site.
Obscure bumble bee *(Bombus caliginosus)*	--/SCE	Meadows and grasslands with flowering plants. May be found in some natural areas within urban environments. Require flowering plants that bloom and provide adequate nectar and pollen throughout the colony's flight period from as early as February to late November.	Unlikely. Suitable habitat not found at the project site.
Pallid bat *(Antrozous pallidus)*	--/SSC	Deserts, grasslands, scrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures.	Unlikely. Suitable habitat not found at the project site.
Pinnacles optioservus riffle beetle *(Optioservus canus)*	--/--	Aquatic, found on rocks and in gravel of riffles in cool, swift, clear streams.	Unlikely. Suitable habitat not found at the project site.
Redwood shoulderband (snail) *(Helminthoglypta sequoicola consors)*	--/--	Known only from south slope of San Juan Grade, near foothills, 8 miles northwest of Salinas.	Unlikely. Suitable habitat not found at the project site.
Salinas harvest mouse *(Reithrodontomys megalotis distichlis)*	--/--	Known only from the Monterey Bay region. Occurs in fresh and brackish water wetlands and probably in the adjacent uplands around the mouth of the Salinas River.	Unlikely. Suitable habitat not found at the project site.
San Francisco garter snake *(Thamnophis sirtalis tetrataenia)*	FE/SE, SFP	Typically found in the vicinity of freshwater marshes, ponds and slow-moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least one foot. Upland areas near water are also very important.	Unlikely. Suitable habitat not found at the project site.
San Joaquin coachwhip *(Masticophis flagellum ruddocki)*	--/SSC	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. Requires mammal burrows for refuge and oviposition sites.	Unlikely. Suitable habitat not found at the project site.
San Joaquin kit fox *(Vulpes macrotis mutica)*	FE/ST	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose-textured sandy soils for burrowing, and suitable prey base.	Unlikely. Suitable habitat not found at the project site.
Santa Cruz black salamander *(Aneides flavipunctatus niger)*	--/SSC	Mixed deciduous and coniferous woodlands and coastal grasslands in San Mateo, Santa Cruz, and Santa Clara Counties. Adults found under rocks, talus, and damp woody debris.	Unlikely. Suitable habitat not found at the project site.
Santa Cruz kangaroo rat *(Dipodomys venustus venustus)*	--/--	Silverleaf manzanita mixed chaparral in the Zayante sand hills ecosystem of the Santa Cruz Mountains. Needs soft, well-drained sand.	Unlikely. Suitable habitat not found at the project site.
Steelhead *(Oncorhynchus mykiss irideus)*	FT/--	Coastal stream with clean spawning gravel. Requires cool water and pools. Needs migratory access between natal stream and ocean.	Unlikely. Suitable habitat not found at the project site.

Species	Status (Federal/State)	Suitable Habitat Description	Potential to Occur on Project Site
Santa Cruz long-toed salamander *(Ambystoma macrodactylum croceum)*	FE/SE, SFP	Wet meadows near sea level in a few restricted locales in Santa Cruz and Monterey Counties. Aquatic larvae prefer shallow (<12 inches) water; use clumps of vegetation or debris for cover. Adults use mammal burrows.	Unlikely. Suitable habitat not found at the project site.
Swainson's hawk *(Buteo swainsoni)*	--/ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas, such as grasslands or agricultural fields supporting rodent populations.	Unlikely. Suitable habitat not found at the project site.
Vernal pool fairy shrimp *(Branchinecta lynchi)*	FT/--	Endemic to the grasslands of the Central Valley, Central Coast Mtns., and South Coast Mtns. in astatic rain-filled pools. Inhabits small, clear-water sandstone depression pools and grass swale, earth slump, or basalt-flow depression pools.	Unlikely. Suitable habitat not found at the project site.
Townsend's big-eared bat *(Corynorhinus townsendii)*	--/SCT	Inhabits a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Unlikely. Suitable habitat not found at the project site.
Tricolored blackbird *(Agelaius tricolor)*	--/SE	Areas adjacent to open water with protected nesting substrate, which typically consists of dense, emergent freshwater marsh vegetation.	Unlikely. Suitable habitat not found at the project site.
Western bumble bee (*Bombus occidentalis*)	--/CE	Meadows and grasslands with flowering plants; can also be found in natural areas within urban environments.	Unlikely. Suitable habitat not found at the project site.
Western mastiff bat *(Eumops perotis californicus)*	--/SSC	Many open, semi-arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Unlikely. Suitable habitat not found at the project site.
Western pond turtle *(Emys marmorata)*	--/SSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites (such as rocks or partially submerged logs) and suitable upland habitat for egg-laying (sandy banks or grassy open fields).	Unlikely. Suitable habitat not found at the project site.
Western red bat *(Lasiurus blossevillii)*	--/--	Roosts primarily in trees, 2-40 feet above the ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Unlikely. Suitable habitat not found at the project site.
Western spadefoot *(Spea hammondii)*	--/SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands, breeds in winter and spring (January - May) in quiet streams and temporary pools.	Unlikely. Suitable habitat not found at the project site.
Western yellow-billed cuckoo *(Coccyzus americanus)*	FC/SE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Unlikely. Suitable habitat not found at the project site
White-tailed kite *(Elanus leucurus)*	--/SFP	Rolling foothills and valley margins with scattered oaks, and river bottomlands or marshes next to deciduous woodlands. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Low Potential. Species known to occur in project vicinity
Yellow rail *(Corturnicops noveboracensis)*	--/SSC	Summer resident in eastern Sierra Nevadas, prefers freshwater marshlands.	Unlikely. Suitable habitat not found at the project site.

SOURCE: CDFW 2023
NOTE: Status Codes:
Federal (USFWS)
FE: Listed as Endangered under the Federal Endangered Species Act.
FT: Listed as Threatened under the Federal Endangered Species Act.
FC: A Candidate for listing as Threatened or Endangered under the Federal Endangered Species Act.
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Appendix A Special-Status Plant Species with Potential to Occur in the Project Vicinity

Species	Status (Federal/State/ CNPS)	Suitable Habitat Description	Potential to Occur on Project Site
Alkali milk-vetch *(Astragalus tener* var. *tener)*	--/--/1B.2	Alkaline sites in playas, valley and foothill grassland (on adobe clay), and vernal pools; elevation 1-60m. Blooming Period: March - June	Unlikely. Suitable habitat not found at the project site.
Anderson's manzanita *(Arctostaphylos andersonii)*	--/--/1B.2	Broadleaved upland forest, chaparral, and North Coast coniferous forest. Known only from the Santa Cruz Mountains. Prefers open sites in redwood forest; elevation 180-800m. Blooming Period: November - April	Unlikely. Suitable habitat not found at the project site.
California alkali grass *(Puccinellia simplex)*	--/--/1B.2	Meadows and seeps, chenopod scrub, valley and foothill grasslands, vernal pools. Alkaline, vernally mesic. Sinks, flats, and lake margins; elevation 1-915m. Blooming Period: March - May	Unlikely. Suitable habitat not found at the project site.
Choris' popcorn-flower *(Plagiobothrys chorisianus* var. *chorisianus)*	--/--/1B.2	Chaparral, coastal scrub, coastal prairie, mesic sites; elevation 15-100m. Blooming Period: March - June	Unlikely. Suitable habitat not found at the project site.
Congdon's tarplant *(Centromadia parryi* spp. *congdonii)*	--/--/1B.1	Valley and foothill grassland (alkaline); elevation 1-230m. Known to occur on various substrates, and in disturbed and ruderal (weedy) areas. Blooming Period: June - November	Unlikely. Suitable habitat not found at the project site.
Contra Costa goldfields *(Lasthenia conjugens)*	FE/--/1B.1	Wet areas in cismontane woodland, playas (alkaline), valley and foothill grassland, and vernal pools; elevation 0-470m. Blooming Period: March - June	Unlikely. Suitable habitat not found at the project site.
Coyote ceanothus *(Ceanothus ferrisiae)*	FE/--/1B.1	Serpentine sites in chaparral, coastal scrub, and valley and foothill grassland; elevation 120-460m. Blooming Period: January - May	Unlikely. Suitable habitat not found at the project site.
Eastwood's goldenbush *(Ericameria fasciculata)*	--/--/1B.1	Closed cone coniferous forest, chaparral (maritime), coastal dunes, and coastal scrub/sand; elevation 30 - 275 meters. Blooming Period: July - October	Unlikely. Suitable habitat not found at the project site.
Fort Ord spineflower *(Chorizanthe minutiflora)*	--/--/1B.2	Coastal scrub, maritime chaparral, sandy openings; elevation 60-145m. Blooming Period: April - July	Unlikely. Suitable habitat not found at the project site.
Fragrant fritillary *(Fritillaria liliacea)*	--/--/1B.2	Coastal scrub, valley and foothill grassland, and coastal prairie. Often on serpentine; various soils reported though usually clay in grassland; elevation 3-410m. Blooming Period: February - April	Unlikely. Suitable habitat not found at the project site.
Gabilan Mountains manzanita *(Arctostaphylos gabrielensis)*	--/--/1B.2	Chaparral, cismontane woodland, granitic substrates; elevation 300-700m. Blooming Period: March	Unlikely. Suitable habitat not found at the project site.
Hairless popcorn flower *(Plagiobothrys glaber)*	--/--/1A	Meadows and seeps (alkaline), marshes and swamps (coastal salt); elevation 15-180m. Blooming Period: March - May	Unlikely. Suitable habitat not found at the project site.

Species	Status (Federal/State/ CNPS)	Suitable Habitat Description	Potential to Occur on Project Site
Hall's tarplant *(Deinandra halliana)*	--/--/1B.1	Cismontane woodland, chenopod scrub, valley and foothill grassland. Variety of substrates, including clay, sand, and alkaline soils; elevation 300-950m. Blooming Period: April - May	Unlikely. Suitable habitat not found at the project site.
Hickman's onion *(Allium hickmanii)*	--/--/1B.2	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland, coastal prairie, sandy loam, damp ground and vernal swales; elevation 20-200m. Blooming Period: April - May	Unlikely. Suitable habitat not found at the project site.
Hooker's manzanita *(Arctostaphylos hookeri* ssp. *hookeri)*	--/--/1B.2	Sandy soils in coastal scrub, chaparral, and closed-cone forest habitats; evergreen; elevation 45-215m. Blooming Period: February - April	Unlikely. Suitable habitat not found at the project site.
Hoover's button-celery *(Eryngium aristulatum* var. *hooveri)*	--/--/1B.1	Vernal pools. Alkaline depressions, roadside ditches, and other wet places near the coast; elevation 5-45m. Blooming Period: July	Unlikely. Suitable habitat not found at the project site.
Indian Valley bush-mallow *(Malacothamnus aboriginum)*	--/--/1B.2	Chaparral and cismontane woodland; rocky, often burned areas. Prefers granitic outcrops and sandy bare soil; elevation 150-1700m. Blooming Period: April - October	Unlikely. Suitable habitat not found at the project site.
Kellogg's horkelia *(Horkelia cuneata* ssp. *sericea)*	--/--/1B.1	Closed-cone coniferous forest, maritime chaparral, coastal scrub, sandy or gravelly openings; elevation 10-200m. Blooming Period: April - September	Unlikely. Suitable habitat not found at the project site.
Legenere *(Legenere limosa)*	--/--/1B.1	In beds of vernal pools; elevation 1-880m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.
Loma Prieta hoita *(Hoita strobilina)*	--/--/1B.1	Wet areas on serpentine substrate in chaparral, cismontane woodland, and riparian woodland; elevation 30-860m. Blooming Period: May - October	Unlikely. Suitable habitat not found at the project site.
Marsh microseris *(Microseris paludosa)*	--/--/1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland; elevation 5-300m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.
Marsh sandwort *(Arenaria paludicola)*	FE/SE/1B.1	Sandy openings in freshwater or brackish marshes and swamps; elevation 3-170m. Blooming Period: May - August	Unlikely. Suitable habitat not found at the project site.
Monterey gilia *(Gilia tenuiflora* ssp. *arenaria)*	FE/ST/1B.2	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, sandy openings; elevation 0-45m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.
Monterey spineflower *(Chorizanthe pungens* var. *pungens)*	FT/--/1B.2	Sandy openings in maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland; elevation 3-450m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.
Most beautiful jewel-flower *(Streptanthus albidus* ssp. *peramoenus)*	--/--/1B.2	Chaparral, valley and foothill grassland, and cismontane woodland; serpentine outcrops, on ridges and slopes; elevation 120-730m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.

Species	Status (Federal/State/ CNPS)	Suitable Habitat Description	Potential to Occur on Project Site
Pajaro manzanita *(Arctostaphylos pajaroensis)*	--/--/1B.1	Sandy soils in chaparral habitat; evergreen; elevation 30-760m. Blooming Period: December - March	Unlikely. Suitable habitat not found at the project site.
Pine rose *(Rosa pinetorum)*	--/--/1B.2	Closed-cone coniferous forest; elevation 2-300m. Blooming Period: May - July	Unlikely. Suitable habitat not found at the project site.
Pink creamsacs *(Castilleja rubicundula* ssp. *rubicundula)*	--/--/1B.2	Chaparral, meadows and seeps, and valley and foothill grassland. Openings in chaparral or grasslands on serpentine soils; elevation 20-900m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.
Pink Johnny-nip *(Castilleja ambigua* var. *insalutata)*	--/--/1B.1	Coastal bluff scrub, coastal prairie. Wet or moist coastal strand or scrub habitats; 3-135m elevation. Blooming Period: May - August	Unlikely. Suitable habitat not found at the project site.
Pinnacles buckwheat *(Eriogonum nortonii)*	--/--/1B.3	Sandy sites in chaparral and valley and foothill grassland, often on recent burns; elevation 300-975m. Blooming Period: May - June	Unlikely. Suitable habitat not found at the project site.
Prostrate vernal pool navarretia *(Navarretia prostrata)*	--/--/1B.1	Coastal scrub, valley and foothill grassland, and vernal pools. Alkaline soils in grassland, or in vernal pools; elevation 15-700m. Blooming Period: April - July	Unlikely. Suitable habitat not found at the project site.
Round-leaved filaree *(California macrophylla)*	--/--/1B.2	Clay sites in cismontane woodland, and valley and foothill grassland; elevation 15-1200m. Blooming Period: March - May	Low Potential. Possible suitable habitat present at the project site and species has been observed in proximity to the project site
Saline clover *(Trifolium hydrophilum)*	--/--/1B.2	Marshes and swamps, valley and foothill grassland, and vernal pools. Prefers wet, alkaline sites; elevation 0-300m. Blooming Period: April - June	Unlikely. Suitable habitat not found at the project site.
San Francisco popcornflower *(Plagiobothrys diffusus)*	--/SE/1B.1	Valley and foothill grassland, and coastal prairie. Historically from grassy slopes with marine influence; elevation 60-485m. Blooming Period: March - June	Unlikely. Suitable habitat not found at the project site.
San Joaquin spearscale *(Atriplex joaquinana)*	--/--/1B.2	Alkaline sites in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland; elevation 1-320m. Blooming Period: April - October	Unlikely. Suitable habitat not found at the project site.
San Joaquin wooly-threads *(Monolopia congdonii)*	FE/--/1B.2	Chenopod scrub and valley and foothill grassland. Alkaline or loamy plains, sandy soils, often with grasses and within chenopod scrub; elevation 60-800m. Blooming Period: February - May	Unlikely. Suitable habitat not found at the project site.
Sand-loving wallflower *(Erysimum ammophilum)*	--/--/1B.2	Maritime chaparral, coastal dunes, coastal scrub, sandy openings; elevation 0 – 60m. Blooming Period: February - June	Unlikely. Suitable habitat not found at the project site.
Sandmat manzanita *(Arctostaphylos pumila)*	--/--/1B.2	Closed cone coniferous forest, maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, sandy openings; elevation 30-730m. Blooming Period: February - May	Unlikely. Suitable habitat not found at the project site.

Species	Status (Federal/State/ CNPS)	Suitable Habitat Description	Potential to Occur on Project Site
Santa Cruz clover *(Trifolium buckwestiorum)*	--/--/1B.1	Broadleaved upland forest, cismontane woodland, and coastal prairie; prefers moist grassland and gravelly margins; elevation 105-610m. Blooming Period: April - October	Unlikely. Suitable habitat not found at the project site.
Santa Cruz tarplant *(Holocarpha macradenia)*	FT/SE/1B.1	Coastal prairie, coastal scrub, and valley and foothill grassland; often on clay or sandy soils; elevation 10-220m. Blooming Period: June - October	Unlikely. Suitable habitat not found at the project site.
Seaside bird's-beak *(Cordylanthus rigidus* ssp. *littoralis)*	--/SE/1B.1	Closed-cone coniferous forest, maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, sandy often disturbed sites; elevation 0-215m. Blooming Period: May - October	Unlikely. Suitable habitat not found at the project site.
Toro manzanita *(Arctostaphylos montereyensis)*	--/--/1B.2	Maritime chaparral, cismontane woodland, coastal scrub, sandy; elevation 30-730m. Blooming Period: February – March	Unlikely. Suitable habitat not found at the project site.
Vernal pool bent grass *(Agrostis lacuna-vernalis)*	--/--/1B.1	Vernal pools (mima mounds); elevation 115-145m.	Unlikely. Suitable habitat not found at the project site.
Woodland woollythreads *(Monolopia gracilens)*	--/--/1B.2	Serpentine, open sites in broadleaved upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland; elevation 100-1200m. Blooming Period: March - July	Unlikely. Suitable habitat not found at the project site.
Yadon's rein orchid *(Piperia yadonii)*	FE/--/1B.1	Sandy sites in coastal bluff scrub, closed cone coniferous forest, maritime chaparral; elevation 10-510m. Blooming Period: May - August	Unlikely. Suitable habitat not found at the project site.

SOURCE: CDFW 2023, CNPS 2023

NOTE: Status Codes:

Federal (USFWS)

FE: Listed as Endangered under the Federal Endangered Species Act.

FT: Listed as Threatened under the Federal Endangered Species Act.

FC: A Candidate for listing as Threatened or Endangered under the Federal Endangered Species Act.

FSC: Species of Special Concern.

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ST: Listed as Threatened under the California Endangered Species Act.

SR: Listed as Rare under the California Endangered Species Act.

SC: A Candidate for listing as Threatened or Endangered under the California Endangered Species Act.

SSC: Species of Special Concern.

SFP: Fully Protected species under the California Fish and Game Code.

SD: Delisted under the California Endangered Species Act.

CNPS Rare Plant Ranks and Threat Code Extensions
1B: Plants that are considered Rare, Threatened, or Endangered in California and elsewhere.
2B: Plants that are considered Rare, Threatened, or Endangered in California, but more common elsewhere.
.1: Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat).
.2: Fairly endangered in California (20-80% occurrences threatened).
.3: Not very endangered in California (<20% of occurrences threatened or no current threats known).

CDE/CCR Title 5 Geologic and Environmental Safety Hazards Evaluation

C

APPENDIX

CDE/CCR Title 5 Geologic and Safety Hazards Evaluation

San Juan School

100 Nyland Drive
APN 002-500-005 (portion)
San Juan Bautista, San Benito County, CA 95045

Prepared for:

Aromas San Juan Unified School District
San Juan Bautista, California

July 11, 2023

Prepared by:

McCloskey Consultants, Inc.

McCloskey Consultants
ENVIRONMENTAL & GEOLOGIC ASSESSMENTS

CDE/CCR TITLE 5 GEOLOGIC AND SAFETY HAZARDS EVALUATION

San Juan School

100 Nyland Drive
APN 002-500-005 (portion)
San Juan Bautista, San Benito County, CA 95045

July 11, 2023

Prepared for:

Aromas San Juan Unified School District

Prepared by:

McCloskey Consultants, Inc.

420 Sycamore Valley Road West

Danville, CA 94526

Belinda Blackie, P.E
Environmental Engineer

Thomas F. McCloskey, P.G., C.E.G., C.Hg.
Principal Geologist

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1.0 INTRODUCTION

The Aromas San Juan Unified School District retained McCloskey Consultants, Inc. (MCI) to perform a CDE/CCR Title 5 Geologic and Environmental Safety Hazards Evaluation (geohazards evaluation) for proposed expansion of San Juan School located at 100 Nyland Drive, on a portion of APN 002-500-005, in San Juan Bautista, San Benito County, California (Subject Property). The purpose of this assessment was to identify geologic and other safety hazards associated with the property, in general accordance with California Education Code 17212.5 for geologic studies and California Department of Education (CDE)/California Code of Regulations (CCR), Title 5, Sections 14010, et. seq. for environmental studies.

The scope of investigative activities and initial findings are summarized in the following sections. This geohazards evaluation has been prepared by MCI for the sole use of the Aromas San Juan Unified School District (User).

2.0 SUBJECT PROPERTY DESCRIPTION

2.1 Location

The Subject Property is located in Section 33, Township 12 South, Range 4 East, Mt. Diablo baseline and meridian, within the City of San Juan Bautista, San Benito County, California (Figures 1 and 2). The Subject Property is within the San Juan Bautista Quadrangle, California USGS 7½-minute series; the longitude and latitude of the Subject Property are identified as 121.532848 west and 36.842476 north.

The Subject Property consists of a single irregularly-shaped parcel of land identified by the San Benito County Assessor's office as a portion of APN 002-500-005, generally adjoining northeast of the intersection of Nyland Drive and The Alameda. The street address for the Subject Property is 100 Nyland Drive in the City of San Juan Bautista, San Benito County, California 95045. An additional address of 300 The Alameda has also been identified in association with the Subject Property. At the time of the study, the Subject Property was developed with facilities of San Juan School.

A creek bed followed by agricultural fields adjoins the Subject Property to the north and northeast and rural residential property adjoins to the east. Undeveloped and residential properties adjoin the Subject Property to the south, with residential and commercial development adjoining to the west. The Subject Property boundaries are delineated by fencing, adjoining roadways and the creek bed, and were explained to MCI in the field by Aromas San Juan Unified School representative Mr. John Dominguez.

2.2 General Characteristics

The irregularly-shaped Subject Property totals approximately 13 acres (565,239 square feet). Located within a mixed-use area of downtown San Juan Bautista, the Subject Property is developed with San Juan School, including portable and permanent classrooms, restrooms, multipurpose room/cafeteria, gym with snack bar, office, maintenance barn and small storage structures/rooms, playfields and playgrounds, tennis courts, parking lots, driveways, undeveloped areas, solar panel array, a sewer lift station and landscaping. All structures at the Subject Property are single story. San Juan School is a pre-kindergarten through 8th grade public educational facility of the Aromas San Juan Unified School District.

2.3 Topography

Based on review of the regulatory agency database report (Appendix A) and the USGS 7.5-minute San Juan Bautista, California topographic map, the Subject Property elevation is approximately 204 feet above mean sea level (msl). Topography of the Subject Property is generally level. Topography in the vicinity demonstrates a very gentle, overall slope downwards towards the north to northeast.

2.4 Historical Usage

Based on a review of historical aerial photographs, topographic maps, regulatory agency records and client-provided documents, the Subject Property appeared largely undeveloped, possibly with a residence on the far southern edge, as early as the 1910s. During at least the 1930s to 1950s, what appeared likely a barn and possibly other smaller structures/enclosures were developed on the eastern edge of the Subject Property. Dry land farming or cattle grazing may have occurred on the Subject Property during this time period as well.

The original buildings of San Juan School, located on the eastern portion of the Subject Property, reportedly were constructed in 1959. The existing maintenance barn appeared added to the school facility in the mid-1970s. The school district's transportation facility, including two underground storage tanks (USTs), at least one fuel dispenser and oil containers/drums, was present on the southeastern corner of the Subject Property from the 1970s through 1990s. The gym, middle school buildings and other existing facilities were constructed on the western portion of the Subject Property in the 1990s. Pre-school structures also appear to have been present on the northwestern portion of the Subject Property in the 1990s through early-2020s, prior to removal and replacement with the existing solar panel array in 2021. Portable structures appear to have been present periodically on the northeastern portion of the Subject property between the early-2000s and the present.

A Chevron service station was constructed on the western edge of the Subject Property (300 The Alameda) between the mid-1950s and mid-1960s. Dispensing fuel from three USTs and possibly conducting vehicle servicing (due to presence of a reported waste tank), the service station remained present on the western portion of the Subject Property through 1987. Due to a release from the gasoline USTs, the Chevron facility was opened as a leaking UST (LUST) case in 1987. Following verification soil sampling conducted for the waste oil UST and several years of groundwater monitoring around the gasoline USTs, all of which demonstrated no residual impact, regulatory case closure was granted for the Chevron LUST case in 1991.

3.0 GEOLOGIC EVALUATION

3.1 Regional Geology

The Subject Property is located on the southwestern margin of the San Juan Valley, between the Gabilan Mountains and Flint Hills, within the Coast Ranges geomorphic province of California. The Coast Ranges province is subparallel to the active San Andreas Fault. The San Andreas Fault is more than 600 miles long, extending from Point Arena to the Gulf of California.

3.2 Subject Property Geology and Soils

Geology in the Subject Property vicinity is dominated by the Franciscan Complex, with the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to north of the Farallon Islands. Specifically, soils in the vicinity of the Subject Property are categorized by the USDA Soil Conservation Service as the Rincon series. Rincon soils are moderately well and well-drained silty clay loam with moderate infiltration rates (EDR 2023).

Fault rupture hazard evaluation was conducted on the Subject Property in 2012 and 2020 as part of geologic/seismic hazards investigation conducted by Moore Twining Associates, Inc. (Moore Twining) and Fugro USA Land, Inc. (Fugro) for proposed seismic upgrades and relocatable classroom additions. The 2020 report with appended 2012 report is included in Appendix C. Information included in the report indicates the Subject Property to be mapped as Quaternary (Upper Pleistocene) terrace deposits underlain by the San Juan Bautista/San Lorenzo formation. Based on subsurface investigation conducted for the studies, near surface soils appear comprised of clayey sand fill to a depth of approximately 3 to 5 feet, underlain by loose to dense native silty sands to a depth of approximately 28 feet and subsequently stiff to very stiff sandy lean clay to a depth of approximately 38 feet. The sandy lean clay was underlain by medium to very dense silty sand to the maximum depth explored of 50 feet (Moore Twining 2020).

3.3 Groundwater

The Subject Property is located within the Gilroy-Hollister Valley Groundwater Basin, North San Benito Subbasin. Geologic units in the San Benito Subbasin consist of Quaternary alluvial and non-marine terrace deposits as well as Plio-Pleistocene non-marine deposits (California Natural Resources Agency undated).

Based on hydrogeological information obtained at the Subject Property for the geologic/seismic hazards and Chevron LUST investigations, shallow groundwater is present at depths of approximately 10 to 12 feet. Groundwater was documented under semi-confined conditions in sand units with clayey units acting as aquitards (Moore Twining 2020). The groundwater flow direction at the Subject Property, calculated during LUST case monitoring, is documented towards the north to north-northeast.

4.0 GEOLOGIC HAZARDS ANALYSIS

4.1 Fault Rupture Hazard Evaluation

The Alquist-Priolo Earthquake Fault Zoning Act was passed by the State of California in 1972, to mitigate earthquake hazards to human-occupied structures. Specifically, the Alquist-Priolo Act was designed to prevent construction of structures designed for human occupation on active faults having surface rupture. The California Geological Survey (CGS) has prepared a series of maps delineating established Earthquake Fault Zones under the Alquist-Priolo Act. Structures proposed for construction within an identified Earthquake Fault Zone require geologic investigation to confirm the structures will not be constructed across active faults. If an active fault is identified within a proposed project site, a setback is required. As not all faults have been identified, additional Earthquake Fault Zones may be added in the future.

Comparison of the Subject Property location to the California Geological Survey (CGS) Earthquake Zones of Required Investigation map indicates all of the Subject Property are located within an identified Alquist-Priolo Earthquake Fault Zone for the San Andreas fault.

Fault rupture hazard evaluation conducted on the Subject Property in 2012 and 2020 by Moore Twining and Fugro as part of the geologic/seismic hazard investigations (Section 3.2, Appendix C) indicated major active faults occurring the north, south, west and east of the Subject Property, with the Subject Property located within an Alquist-Priolo Earthquake Fault Zone. The 2012 fault rupture hazard evaluation report concluded that “geomorphic indicators suggestive of active faulting were not noted on or adjacent to the school site in the areas investigated” and “the potential for fault rupture on the site is considered low” (Moore Twining 2020).

Due to location within the Alquist-Priolo Earthquake Fault Zone, trenching for the presence of active faulting would be required for new construction if not previously performed in that area. A setback would be required if active faulting were identified to avoid new construction over an active fault.

4.2 Ground Shaking

The Subject Property is located in a seismically-active area, and the proposed structures on the Subject Property likely will be subject to strong ground shaking. Regional faulting summarized in the 2020 Moore Twining geologic/seismic hazard investigation report (Section 3.2; Appendix C) indicated the mapped trace of the San Andreas Fault Zone approximately 165 feet northeast of the 2020 proposed classroom building. Additional active faults in the Subject Property vicinity were noted as the Zayante-Vergeles fault approximately 3 miles southwest and the Calaveras fault approximately 7 miles east (Moore Twining 2020).

Seismic ground motion evaluation was conducted on the Subject Property in 2012 and 2020 by Moore Twining and Fugro as part of the geologic/seismic hazard investigations (Section 3.2). Investigations indicated that the proposed San Juan School project design should include review of the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website (https://seismicmaps.org/) to determine whether a ground motion hazard analysis is required. If ground motion hazard analysis is determined to be required, the 2020 Moore Twining report stated Moore Twining should be notified and requested to conduct additional analysis, develop updated seismic factors and update the 2019 CBC values included in the 2020 report (Moore Twining 2020).

4.3 Liquefaction

The sudden loss of shear strength in soil due to a rapid increase in pore water pressure, such as that caused by a seismic event, is known as liquefaction. When liquefaction occurs, soil behaves more as a liquid than a solid, threatening the stability of structures constructed on the surface. Soil conditions resulting in a high likelihood of liquefaction are low-density granular soils (sands, silts, gravels and combinations of the three) with a high groundwater table.

The CGS Earthquake Zones of Required Investigation map indicates the Subject Property is located within an area that has not been evaluated for liquefaction. The 2012 fault rupture hazard evaluation report (Section 3.2; Appendix C) included liquefaction analysis for the Subject Property, using a historic high groundwater depth of 10 feet. The analysis concluded that "liquefaction would occur as a result of the design level seismic event in silty sands at depths between about 13 and 19 feet".

4.4 Seismically-Induced Settlement

Settlement of unsaturated granular soils through densification and particle rearrangement during a seismic event is known as seismically-induced settlement. Differing from liquefaction in that no buildup of excess pore water pressure occurs, similar impacts to structures may result from seismically-induced settlement.

The 2012 fault rupture hazard evaluation report (Section 3.2; Appendix C) stated that results of the analysis indicated “a total seismic settlement of about 2 inches”; a “differential seismic settlement of about 1 inch in 30 feet” also was estimated (Moore Twining 2020).

4.5 Expansive Soils

The 2020 geologic/seismic hazard investigation conducted at the Subject Property (Section 3.2; Appendix C) included an Atterberg Limit test and, previously, expansion index testing was conducted at the Subject Property as well. The results of the testing suggested “some relatively minor swell could occur and potentially cause heave and cracking to occur…” (Moore Twining 2020).

4.6 Subsidence

Areas underlain by aquifer systems at least partially comprised of fine-grained sediments that have been subject to extensive groundwater pumping may be subject to land subsidence. As the support of an aquifer system is comprised of the granular structure and fluid pressure of the groundwater filling the intragranular pore spaces, significant groundwater withdrawal leads to lower fluid pressure and a resulting increase in weight of the overlying soil on the granular structure. Excessive pumping and associated pressure on the soil structure may result in compaction of the aquifer, known as land subsidence.

The 2020 geologic/seismic hazard investigation conducted at the Subject Property (Section 3.2; Appendix C) concluded the “site region is not subject to regional subsidence, thus, subsidence is not a concern…”.

4.7 Landslides and Slope Stability

Topography at the Subject Property is relatively flat and the Subject Property is not situated in immediate proximity to any significant slopes. The 2020 geologic/seismic hazard investigation conducted at the Subject Property (Section 3.2; Appendix C) noted that vicinity ground surface beyond the Subject Property fence line falls approximately 5½ percent for about 135 feet to the mapped trace of the San Andreas fault. Based on topography, landslides are not anticipated to be a significant concern.

4.8 Flood Hazard

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Community Panel Number 06069C0158D, dated April 16, 2009, depicts the eastern and northeastern portions of the Subject Property within Flood Zone X. FEMA identifies Flood Zone X as an Area of Minimal Flood Hazard. The remainder of the Subject Property is mapped within a Special Flood Hazard Area (Base Flood Elevation ranging from 195 to 208 feet), subject to inundation by the 1% annual chance flood.

4.9 Dam Inundation

Catastrophic failure of dams resulting in inundation of down-stream areas is a rare occurrence, and most likely to occur following a significant seismic event. The State Office of Emergency Services (OES), utilizing information from the US Army Corps of Engineers, US Bureau of Reclamation, and Department of Water Resources (DWR), is the agency responsible for providing local governments with critical hazard response planning information, including that related to flooding from dam inundation.

The DWR, Division of Safety of Dams California Dam Breach Inundation Map website was reviewed on May 18, 2023 to identify dam inundation zones in the Subject Property vicinity. None of the dams for which inundation mapping is available included the Subject Property within the inundation area.

4.10 Tsunami/Seiche

A long-period sea wave generated by an earthquake or submarine landslide is known as a tsunami. A similar wave occurring in a large body of water such as a lake or reservoir is known as a seiche. The Subject Property is located in the San Juan Valley, beyond a mountain range from the Pacific Ocean more than 15 miles west and over 6 miles from the nearest significantly-sized reservoir. Based on the distance of from these bodies of water, a tsunami or seiche would not impact the Subject Property.

4.11 Volcanic Activity

Volcanic activity historically has occurred in California, as recently as the 1910s in northeastern California. Falling ash typically is the most significant hazard from a volcanic eruption. There are no major volcanic areas nearby with recognized potential to impact the Subject Property.

4.12 Naturally-Occurring Asbestos

Asbestos, a naturally-occurring, fibrous silicate mineral, is a known carcinogen. Naturally-occurring asbestos (NOA) most frequently occurs in and immediately adjacent to areas of

Ultramafic (igneous and metamorphic rocks with high iron and magnesium concentrations) rock outcrops. The nearest outcrop of Ultramafic rock is documented approximately 5½ miles generally north of the Subject Property, near the confluence of the Pajaro River and Carnadero Creek (California Geological Survey, 2002). The 2020 geologic/seismic hazard investigation conducted at the Subject Property (Section 3.2; Appendix C) reportedly did not encounter Ultramafic rock in Subject Property soil, however no soil quality evaluation for asbestos appears to have been conducted during the investigation. Location of the Ultramafic rock outcrop within the 10-mile distance established by the DTSC Schools Program guidelines triggers the requirement for sampling for NOA fibers.

4.13 Radon

Radon, a colorless, odorless and tasteless gas, is a naturally-occurring byproduct of the decay of uranium. As a radioactive gas, studies have demonstrated a correlation between elevated radon concentrations and lung cancer. The correlation is most pronounced for humans inhabiting residential buildings with elevated radon concentrations over a period of years. The US Environmental Protection Agency (EPA) has designated each county in the United States one of three zones based on the potential for radon accumulation. The EPA action limit for asbestos is 4.0 pCi/L.

Based on information provided in Federal and State radon screening test data included in the regulatory agency database report, three State radon screening tests have been performed within the Subject Property zip code (95045) and two Federal radon screening tests have been conducted in San Benito County. The Federal radon screening tests of the 1st floor living area reported average radon activity at 0.350 pCi/L, with none of the results exceeding the 4 pCi/L action level. State tests reported one radon concentration exceeding the 4 pCi/l action level, at a concentration or 4.3 pCi/l. San Benito County is reported in Federal EPA Radon Zone 2, with average indoor radon levels between 2 and 4 pCi/l.

5.0 ENVIRONMENTAL SAFETY HAZARDS EVALUATION

5.1 Potential Presence of Toxic and Hazardous Substances

5.1.1 Agricultural Use

Previous agricultural cultivation of the Subject Property may have occurred during at least the 1930s to 1950s but appears to have been dry-land farming or grazing. Standard agricultural practices for this type of use did not typically include the application of persistent chemicals. Evaluation of near-surface soil for the presence of residual concentrations of pesticides and related metals exceeding DTSC school standards is not recommended.

5.1.2 Aged Structures

The original school structures on the Subject Property have been present since 1959; other historical structures previously were documented on the Subject Property as early as the 1930s. Depending on the dates of construction for the existing and historical structures, the paint may have contained lead, and flaking lead-based paint (LBP) and flaking window caulking containing PCBs may have impacted exposed soil in the vicinity of the structures. Additionally, application of pesticides and/or herbicides may have occurred around the building perimeters. Evaluation of exposed near-surface soil around the existing and former structure perimeters for the presence of pesticides and related metals, as well as lead and PCBs, is recommended. Which structures and which analytes will vary depending on the dates of construction.

5.1.3 Oil and Gas Wells

Visual observation and review of Department of Conservation, Geologic Energy Management Division (CalGEM) maps available on the CalGEM website indicate no gas wells or dry holes on or within 1,500 feet of the Subject Property.

5.1.4 Other Toxic and Hazardous Substances

5.1.4.1 On-Site

Reportable quantities of hazardous materials are not present at the Subject Property, and hazardous waste is not generated. The majority of the hazardous materials observed at the Subject Property were small quantifies and were stored in the maintenance barn and included 1-quart, 1-gallon and 5-gallon containers of assorted maintenance and janitorial materials, paint and gasoline.

While the school district's transportation facility was located on the southeastern portion of the Subject Property in the 1970s through 1990s, one 1,000-gallon gasoline UST and one 1,000-gallon diesel UST, at least one fuel dispenser and waste oil pails/drums were recorded to be present. Bus maintenance appeared to have been conducted, and additional vehicle fluids may have been stored/utilized on this area of the Subject Property. Stained soil/concrete also was documented in this area of the Subject Property.

The Chevron station on the western portion of the Subject Property from the mid-1950s/mid-1960s through 1987 was documented as operating fuel USTs as well as a waste oil UST. Based on the presence of a waste oil UST, vehicle servicing likely was conducted at the Chevron station, and possibly included sub-grade hydraulic hoists, with assorted vehicle fluids and associated hazardous wastes likely used/generated at the facility. Hydraulic and other oil at the station may have contained polychlorinated biphenyls (PCBs). As discussed in Section 2.4, a LUST case related to a gasoline release from the Chevron station received regulatory case closure in 1991.

The EDR Radius Map Report (Appendix A) includes a search of regulatory agency databases as specified in American Society of Testing and Materials (ASTM) E 1527-21. The Subject Property was listed on the LUST, Cortese, CERS, SWEEPS UST, HIST UST, HAZNET, HWTS, and EDR Historical Auto databases in the database report as the former Chevron service station addressed as 300 Alameda Street (300 The Alameda). The Subject Property, as Aromas San Juan Unified School District, also was included on the HAZNET, HWTS and RCRA NonGen/NLR databases.

Dias Chevron Service Station was reported at 300 The Alameda from at least 1969 through 1995. Four USTs were documented at the station, one 1,000-gallon single-wall waste tank and three 10,000-gallon single-wall product tanks (specific contents not listed). Chevron was included on the LUST database for a release of gasoline to groundwater; additional information on the LUST case was reviewed through the San Benito County Health and Human Services Agency, Environmental Health Division (SBCHHS). The regulatory status was listed as Completed-Case Closed as of 1991, with no significant residual impact to soil or groundwater quality noted.

Aromas San Juan Unified School district database listings were for disposal of asbestos-containing waste and a small quantity of organic solids in 2004, 2005 and 2019. Aromas San Juan Unified School District was listed as a RCRA Non-Generator/No Longer Regulated (NonGen/NLR) facility in 2019, with no violations or evaluations found. These listings are not indicative of significant hazardous materials use/storage at the Subject Property. Generation/disposal of significant quantities of non-demolition/renovation hazardous wastes was not documented at the Subject Property.

Hazardous materials and UST files related to the Subject Property addresses of 100 Nyland Drive and 300 The Alameda were reviewed at the San Benito County Health and Human Services Agency, Environmental Health Division (SBCHHS) offices and provided by the SBCHHS via email on May 25 and 30, 2023. The SBCHHS had one file for San Juan School, including a February 23, 1995 letter from the Office of Emergency Services to the Aromas San Juan Unified School District, discussed in a follow-up to a UST inspection at the maintenance yard (transportation facility) at San Juan School. No further information on the USTs was included in the letter, but a reference to the school USTs was identified in a document prepared for the former Chevron service station (discussed below). The Chevron document indicated the presence of one 1,000-gallon gasoline UST and one 1,000-gallon diesel UST in the transportation facility.

Documents in the San Juan School file also indicated an area of oil staining observed along the fence outside the maintenance shop in the transportation yard, appearing related to oil containers in that location. The photographs showed two “salvage” drums and a smaller steel drum along a fence line, as well as a fuel dispenser with a hose connection having a small stain on concrete. Darkened soil and/or concrete along the fence line and other staining in the vicinity of the dispenser was visible on the photographs.

The SBCHHS also had a file for the former Chevron service station addressed as 300 The Alameda, on the western portion of the Subject Property. Available information indicated the most recent generation of USTs at the Chevron facility, installed in 1982, included three 10,000-gallon fiberglass gasoline USTs, one regular and two unleaded, and one 1,000-gallon fiberglass waste oil UST. The four USTs were removed from the Chevron station in 1987, at which time the remainder of the Chevron facility also was demolished. Soil samples collected beneath the waste oil UST did not have detectable concentrations of total petroleum hydrocarbons as diesel (TPHd), oil-range petroleum hydrocarbons, or volatile organic compounds (VOCs) including chlorinated VOCs. A groundwater grab sample from the gasoline UST pit identified detectible concentrations of TPHg and BTEX.

Due to TPHg and BTEX in groundwater sampled from the gasoline UST pit, a quarterly groundwater monitoring program was implemented. At the time the monitoring program was initiated, the down-gradient monitoring well was permanently obstructed and therefore no down-gradient well was available for sampling throughout the monitoring period. Groundwater monitoring was conducted from 1987 through May 1990. TPHg and BTEX were not detected after September 1988.

The RWQCB issued a closure letter for the former Chevron station LUST case on November 8, 1991. There were no further requirements for soil or groundwater quality investigation or monitoring outlined in the closure.

The former Chevron service station also was included on the Regulated Site Portal Database as a LUST cleanup site with a start date of 1987 and an end date or 1991. No further information on the LUST case was included in the listing.

The Subject Property is not listed on the California Department of Toxic Substances Control (DTSC) EnviroStor database.

5.1.4.2 Off-Site

To evaluate potential off-Site toxic and hazardous substance users within ¼ mile of the Subject Property, the EDR radius map report, SWRCB GeoTracker, and DTSC EnviroStor and Regulated Site Portal databases were reviewed/researched. Additionally, vicinity facilities were identified through a Subject Property vicinity reconnaissance. Records for facilities with documented hazardous materials storage were requested from the SBCHHS.

Brendas Classic Cleaners was listed at the commercial/retail center adjoining west of the Subject Property (301 The Alameda) in 1995 and 1996. Although potentially up-gradient of the Subject Property, based on the very short period of time the facility was documented at the location it appears unlikely of significant concern.

Multiple listings for two sites adjacent to each other at 101 and 106 The Alameda (Mascovich Properties, J&K Union Service; B&K Union Tow Service) indicate a somewhat co-joined petroleum hydrocarbon groundwater plume in that vicinity, approximately 500 feet northwest of the Subject Property. Based on groundwater flow direction measured for the LUST cases at these sites, they are predominantly cross- but occasionally up-gradient of the Subject Property. Both cases have a regulatory status of Completed-Case Closed, with the 101 The Alameda site having the most available data through GeoTracker. The case closure summary for the 101 The Alameda site stated the groundwater plume was stable and/or shrinking at the time of closure in 2015. Although the contaminant plume extended off-site, the down-gradient edge extended fewer than 250 feet with benzene concentrations exceeding water quality objectives. Based on this information, as well as review of additional groundwater monitoring data obtained through the GeoTracker database, the residual groundwater impact from these sites appears unlikely of significant concern to the Subject Property. Low level petroleum hydrocarbon and benzene impact could remain in the vicinity however.

Based on the available information, none of the other listed off-site facilities appear to be of significant concern to the Subject Property.

Several additional facilities within 1,500 feet of the Subject Property were included on regulatory agency databases reviewed in the agency database report. Regulatory agency database records available in the database report did not indicate any releases or regulatory violations indicative of a concern. The SBCHHS maintained no records of significance for other vicinity facilities within ¼ mile of the Subject Property.

Based on the available information, no vicinity properties within ¼ mile radius appear likely to be of significant impact to the Subject Property through storage of significant quantities of hazardous materials or documented releases to soil and/or groundwater.

5.2 Solid Waste or Hazardous Waste Transportation, Storage, or Disposal Facilities

A review of the Solid Waste Facilities/Landfill Facilities (SWF/LF), Waste Management Unit Database System (WMUDS/SWAT), and Federal Resource Conservation and Recovery Act (RCRA) Transportation, Storage, and Disposal Facilities (TSDF) databases included in the EDR report (Appendix A) did not reveal the presence of solid waste or hazardous waste transportation, storage, or disposal facilities within ½ mile of the Subject Property.

5.3 High-Pressure Natural Gas or Fuel Transmission Pipelines

The National Pipeline Mapping Service (NPMS) Public Map Viewer application of the Department of Transportation (DOT) depicted no natural gas transmission or hazardous liquid pipelines within ½ mile of the Subject Property. Additionally, information obtained from Mr. Hondo Lobley of PG&E on May 18 and 19, 2023, the gas provider for the Subject Property, indicated there are no natural gas lines operating at a pressure of 80 psi or greater within 1,500 feet of the Subject Property.

5.4 High-Volume Water and Wastewater Pipelines

The City of San Juan Bautista is the potable water provider for San Juan Bautista and the Subject Property. According to information provided by Mr. Nicholas Bryan with the City of San Juan Bautista Department of Public Works, received via email from Mr. Jerry Sanguinetti of MNS Engineers/City of San Juan Bautista Engineering Department on May 31, 2023, the City of San Juan Bautista operates several 12-inch or greater diameter pipelines within 1,500 feet of the Subject Property. Locations of the pipelines are depicted on Figure 2, with the nearest pipelines documented adjoining west of the Subject Property in The Alameda south of Nyland Drive (16-inch diameter) and along Fourth Street beginning at The Alameda (12-inch diameter). Two additional 12-inch diameter pipelines were documented approximately 1/8 mile generally northwest and south of the Subject Property. Based on location of 12-inch diameter water pipelines within a 1,500-foot radius of the Subject Property, a pipeline risk analysis is required by the CDE.

The Aromas San Juan Unified School District operates a private well for irrigation of the Subject Property. According to information provided by Aromas San Juan Unified School District representative John Dominguez, the pipeline from the well is a 3-inch diameter line that increases to 4 inches in diameter. As the well pipeline is fewer than 12 inches in diameter, a pipeline risk analysis is not required by the CDE.

The City of San Juan Bautista also provides sewer service for San Juan Bautista and the Subject Property. According to information provided by Mr. Nicholas Bryan of the City of San Juan Bautista Department of Public Works, received via email from Mr. Jerry Sanguinetti of MNS Engineers/City of San Juan Bautista Engineering Department on May 31, 2023, no pressurized ("force") sewer mains operating at 80 psi or greater are located within 1,500 of the Subject Property. As the force mains are less than 80 psi, a pipeline risk analysis is not required by the CDE.

5.5 Electromagnetic Fields/Electrical Power Lines

The CDE, in consultation with the California Department of Health Services (DHS), has established required separation distances for proposed school facilities in proximity to easements for high-voltage power transmission lines. The required distances between the edge of the transmission line easements and any portion of a school property line are: 100 feet for a 50 to 133 kV line, 150 feet for a 220 to 230 kV line, and 350 feet for a 500 to 550 kV line.

Overhead power lines were observed extending along the western and eastern edges of The Alameda adjoining west of the Subject Property perimeter as well as extending along the eastern edge of the Subject Property and to the water well adjoining north at the time of the Subject Property reconnaissance (Figure 2). Mr. Hondo Lobley with PG&E, responding via email on May 25, 2023 with information provided him by the PG&E electric division, reported that PG&E has no transmission or distribution lines of 50 kV or greater within 350 feet of the Subject Property. The observed power lines are less than 50 kV and therefore no setback is required.

5.6 Proximity to Facilities Generating Hazardous Air Emissions

The Subject Property is not included on the Emissions Inventory Database of the Monterey Bay Air Resources District (MBARD), as identified through review of the regulatory agency database report. MBARD reported no current or expired emission permits for the Subject Property.

An MBARD portable air monitoring trailer was staged on the western portion of the Subject Property, near a sewer lift station. A request for data from the monitoring point was requested from the MBARD on May 30, 2023. Requested information was not available at the time this study was completed. As site-specific air monitoring data is not a requirement of the Title 5 study, this is not identified as significant.

MBARD identified three facilities within an approximately ¼-mile radius of the Subject Property having permits or permits to construct facilities with criteria pollutant emissions. Single Origin dba Vertigo Coffee Roasters at 81 Fourth Street, approximately 142 feet west-southwest, is permitted for operation of a coffee roaster. Pacific Bell Telephone Company at 110 Third Street, 1/8 mile north-northwest, is permitted for a generator with an internal combustion engine. SJB Development LP dba The Alameda Plaza at 404 The Alameda, adjoining south of Highway 156, has an authority to construct a gasoline dispensing facility with two USTs and six dispensers with a vapor polisher enhanced vapor recovery system, dated June 2021. MCI notes this property currently is undeveloped.

Based on the source types permitted and/or authorized by MBARD, the sources are not of significant concern.

5.7 Proximity to Railroads

Railroad tracks were not observed or documented currently within 1,500 feet of the Subject Property.

5.8 Proximity to Airports

Review of the Google Earth 2021 aerial photograph, as well as other online sources, identified no airports within 2 nautical miles of the Subject Property.

5.9 Water/Fuel Storage Tanks

Fuel or water above-ground storage tanks (ASTs) were not observed or documented on the Subject Property at the time of the reconnaissance.

No fuel or water ASTs were observed through reconnaissance or 2021 Google Earth aerial photography review, or otherwise were documented, within 1,500 feet of the Subject Property. Unidentified fuel or water ASTs not readily observed or documented may be present.

5.10 Traffic Corridor

Highway 156, highway exit lanes to The Alameda and the associated right-of-ways adjoin south of the Subject Property, with the nearest edge of the roadway approximately 50 feet from the nearest property perimeter. Based on location of the highway, additional analysis appears required by the CDE, possibly including an evaluation of traffic flow, traffic accidents, roadway accidents involving hazardous materials and an evaluation of noise impact.

6.0 FINDINGS AND RECOMMENDATIONS

Based on the results of the geologic and environmental safety hazards evaluation conducted in general accordance with California Education Code 17212.5 for geologic studies and California Department of Education (CDE)/California Code of Regulations (CCR), Title 5, Sections 14010, et. seq. for environmental studies, the following summary of findings and recommendations is presented.

6.1 Geologic Hazards

- All or parts of the Subject Property are located within an identified Alquist-Priolo Earthquake Fault Zone for the San Andreas fault. Other major active faults occur to the north, south, west and east of the Subject Property. Due to location with the Alquist-Priolo Earthquake Fault Zone, studies for active surface faulting is required prior to new construction unless the location was previously evaluated. If an active fault trace is identified, a building setback would be required. A 2012 fault rupture hazard evaluation report on a portion of the Subject Property concluded that “the potential for fault rupture on the site is considered low” (Moore Twining 2020). That statement applies to the area studied for one new building and not the entire Subject Property.

- The Subject Property is located in a seismically active area, and structures on the Subject Property are likely to be subject to strong ground shaking. Previous investigations indicated the proposed project design should include review of the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website (https://seismicmaps.org/) to determine whether a ground motion hazard analysis is required. If ground motion hazard analysis is determined to be required, additional analysis should be conducted, seismic factors updated and the 2019 CBC values included in the 2020 Moore Twining report also updated.

- The Subject Property is located within an area that has not been evaluated for liquefaction by the CGS. Analysis conducted for the Subject Property 2012 fault rupture hazard evaluation report concluded that “liquefaction would occur as a result of the design level seismic event in silty sands at depths between about 13 and 19 feet”. Appropriate design measures should be implemented.

- Based on the 2012 fault rupture hazard evaluation report, “a total seismic settlement of about 2 inches” and, alternately, a “differential seismic settlement of about 1 inch in 30 feet” were estimated. Appropriate design measures should be implemented.

- The 2020 geologic/seismic hazard investigation suggested “some relatively minor swell could occur and potentially cause heave and cracking to occur…” as a result of expansive soils at the Subject Property. Appropriate design measures should be implemented.

- The 2020 geologic/seismic hazard investigation concluded the “site region is not subject to regional subsidence.”

- Topography at the Subject Property is relatively flat and the Subject Property is not situated close to any slopes. Based on the topography, the potential for landslides or the failure of natural slopes to impact Subject Property development is low.

- The eastern and northeastern portions of the Subject Property are located within Flood Zone X, which is an area of minimal flood hazard. The remainder of the Subject Property is mapped within a Special Flood Hazard Area (Base Flood Elevation ranging from 195 to 208 feet), subject to inundation by the 1% annual chance flood. The flood hazard at the

Subject Property should be addressed through assessment of flood potential and mitigation.

- Based on dam inundation maps available on-line, none of the dams for which inundation mapping is available included the Subject Property within the inundation area.

- Based on the distance of the Subject Property from any large bodies of water, a tsunami or seiche would not impact the Subject Property.

- There are no major volcanic areas nearby with recognized potential to impact the Subject Property.

- Ultramafic rock outcrops are located approximately 5½ miles from the Subject Property, triggering NOA sampling as required by DTSC Schools Program guidelines.

- The Federal radon screening tests of the 1st floor living area reported average radon activity at 0.350 pCi/L, with none of the results exceeding the 4 pCi/L action level. State tests reported one radon concentration exceeding the 4 pCi/l action level, at a concentration or 4.3 pCi/l. San Benito County is reported in Federal EPA Radon Zone 2, with average indoor radon levels between 2 and 4 pCi/l. There appears to be a low potential for radon accumulation within buildings on the Subject Property and site-specific radon testing is not recommended.

6.2 Environmental and Facilities Safety Hazards

- The Subject Property may have been dry land farmed or used for animal grazing during at least the 1930s to 1950s. The presence of residual concentrations of pesticides and related metals exceeding DTSC school standards is considered low and no sampling for this concern is recommended.

- The original school structures on the Subject Property have been present since 1959; other historical structures previously were documented on the Subject Property as early as the 1930s. The presence of lead from flaking LBP, PCBs from window caulking and pesticides and/or herbicides from application around building perimeters may remain in near-surface soil. Evaluation of exposed near-surface soil around the existing and former structure perimeters for the presence of pesticides and related metals, as well as lead and PCBs, exceeding DTSC school standards is recommended. Which analytes to test for depends on the age of the structures.

- No gas production wells or plugged dry holes are located on or within 1,500 feet of the Subject Property.

- A closed LUST case for the former Chevron service station is documented on the western portion (300 The Alameda) of the Subject Property. Potential very low-level residual petroleum hydrocarbon impact, as well as lead, from former USTs and/or vehicle repair activities may remain in soil on this area of the Subject Property.

- Two USTs were reported within the transportation facility located on the southeastern portion of the Subject Property in the 1970s through 1990s and there are no records they were removed. Bus maintenance appeared to have been conducted, and additional vehicle fluids may have been stored/utilized on this area of the Subject Property. Stained soil/concrete also was documented in this area of the Subject Property. Performance of a UST survey and soil and groundwater quality investigation should be considered to evaluate whether the UST systems and other hazardous materials may have impacted soil and/or groundwater quality.

- No significant hazardous materials/waste facilities and/or solid waste-related facilities are located within ¼ mile of the Subject Property.

- PG&E reported no natural gas pipelines with operating pressures exceeding 80 psig within 1,500 feet of the Subject Property. Additionally, no hazardous liquid pipelines are reported within 1,500 feet of the Subject Property.

- Four City of San Juan Bautista 12- and 16-inch diameter water pipelines are located within 1,500 feet of the Subject Property; no sewer force mains of 80 psi or greater are reported within 1,500 feet. Based on locations of the City of San Juan Bautista water pipelines within a 1,500-foot radius of the Subject Property, a pipeline risk analysis is required by the CDE.

- No PG&E transmission or distribution lines of 50 kV or greater were identified within 350 feet of the Subject Property.

- There are no significant permitted air emissions facilities located on or within ¼ mile of the Subject Property.

- Railroad tracks are not located within 1,500 feet of the Subject Property.

- No airports are located within the CDE guideline of 2 nautical miles of the Subject Property.

- Fuel or water ASTs are not present on the Subject Property. No significant fuel or water ASTs were observed or documented on properties within 1,500 feet of the Subject Property.

6.3 Additional Studies and/or Design Measures

Based on the current Subject Property and vicinity conditions, and the applicable standards followed in conducting this study, the following geological studies, soil/soil vapor/groundwater quality studies, safety studies, and/or risk assessments appear recommended:

- To address location of the Subject Property within an Alquist-Priolo Earthquake Fault Zone, surface rupture hazards studies will be needed for new construction in not previously evaluated through fault trenching.
- To address the site-specific potential for geologic hazards attributable to ground shaking, review of the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website should be conducted and, if ground motion hazard analysis is determined to be required, additional analysis should be conducted, seismic factors updated and the 2019 CBC values included in the 2020 Moore Twining report also updated.
- To address the potential for geologic hazards attributable to liquefaction, seismic settlement and expansive soils, appropriate design measures should be implemented.
- To address location of a portion of the Subject Property within a Special Flood Hazard Area, an assessment of flood potential and mitigation is required.
- To address location of the Subject Property within 10 miles of Ultramafic rock outcrops, NOA sampling is required.
- Site-specific radon testing could be conducted to evaluate the potential for radon accumulation in Subject Property buildings.
- To address potential impact to near-surface soil from aged/former structures and application of pesticides/herbicides around building perimeters, soil quality evaluation is recommended.
- To address the potential presence of undocumented USTs and residual impact from vehicle repair activities in the location of the former school district transportation facility, performance of a UST survey and subsurface investigation is recommended.
- To address location of four 12-inch diameter or greater water pipelines within 1,500 feet of the Subject Property, a pipeline risk analysis in accordance with the School Site Selection and Approval Guide requirements is required.

- To address location of the Subject Property adjoining the Highway 156 traffic corridor, additional analysis appears required.

7.0 REFERENCES

California Department of Conservation, Geologic Energy Management Division (CalGEM) website. https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx

California Department of Education website. http://www.cde.ca.gov/ls/fa/sf/schoolsiteguide.asp?print=yes

California Department of Public Health, Department of Health Services, February 2016. *California Indoor Radon Test Results*. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cdph.ca.gov/Programs/CEH/DRSEM/CDPH%20Document%20Library/EMB/Radon/Radon%20Test%20Results.pdf

California Department of Water Resources website. http://www.water.ca.gov/groundwater/bulletin118/history.cfm

California Department of Water Resources, Division of Safety of Dams, California Dam Breach Inundation Maps website. https://fmds.water.ca.gov/maps/damim/

California Geological Survey, Department of Conservation website. http://www.consrv.ca.gov/CGS/information/publications/cgs_notes/note_36/note_36.pdf.

California Geological Survey. "Earthquake Zones of Required Investigation." *ArcGIS Web Application.* maps.conservation.ca.gov/cgs/EQZApp/app/.

California Regional Water Quality Control Board, Central Coast Division. tom.sayles@waterboards.ca.gov

City of San Juan Bautista, Mr. Nicholas Bryan, publicworks@san-juan-bautista.ca.us

City of San Juan Bautista/MNS Engineers, Mr. Jerry Sanguinetti, jsanguinetti@mnsengineers.com

City of San Juan Bautista, Mr. Paul Greenway, cityengineer@san-juan-bautista.ca.us

City of San Juan Bautista, Water Master Plan, City of San Juan Bautista, *Exhibit 1 Existing Water System and Service Area (preliminary)*, undated.

DTSC Envirostor website. http://www.envirostor.dtsc.ca.gov/public

DTSC Regulated Site Portal website. https://siteportal.calepa.gov/nsite/map/help

Environmental Data Resources Inc. *The EDR Aerial Photo Decade Package, San Juan School, 100 Nyland Drive, San Juan Bautista, CA 95045, Inquiry Number 7330807.8*. May 10, 2023.

Environmental Data Resources Inc. *The EDR Radius Map Report with GeoCheck, Yosemite Charter School, San Juan School, 100 Nyland Drive, San Juan Bautista, CA 95045, Inquiry Number 7330807.2s*. May 8, 2023.

Federal Emergency Management Agency, Flood Insurance Rate Map – Community Panel Number: 06069C0158D, dated April 16, 2009.

Google Earth. 2021 Satellite and 2023 Street View Photographs.

Monterey Bay Air Resources District, Ms. Cindy Searson, csearson@mbard.org

Moore Twining Associates, Inc. *Geologic/Seismic Hazrads investigation, Proposed Relocatable Classrooms, San Juan School, 100 Nyland Drive, San Juan Bautista, California*. April 29, 2020.

National Pipeline Mapping System, Public Map Viewer website: https://www.npms.phmsa.dot.gov/PublicViewer/

Pacific Gas and Electric Company, Mr. Hondo Lobley, jul7@pge.com

Pacific Gas and Electric Company, Mr. Mike Allen, MJAM@pge.com

San Benito County Health and Human Services Agency, Environmental Health Division, Ms. Rhiannon Beltran, rbeltran@cosb.us and Ms. Olga Vargas, ovargas@cosb.us

SWRCB Geotracker website. http://www.geotracker.swrcb.ca.gov

United States Department of Geological Survey, 1989. *Areas Subject to Potential Hazards from Future Eruptions in California; modified from: Miller, 1989, USGS Bulletin 1847.* http://vulcan.wr.usgs.gov/Volcanoes/California/Coso/framework.html

8.0 LIMITATIONS

The conclusions and recommendations presented in this CDE/CCR Title 5 Geologic and Environmental Safety Hazards Evaluation were based on reasonably observable Subject Property conditions and publicly accessible information, including documents provided and/or prepared by others.

MCI is not responsible for the accuracy of the data provided by others. Publicly accessible information cannot be relied upon to definitively confirm or deny the existence of recognized environmental conditions at the Subject Property. No warranty, expressed or implied, has been made, except that the services have been performed in general accordance with California Education Code 17212.5 for geologic studies and California Department of Education (CDE)/California Code of Regulations (CCR), Title 5, Sections 14010, et. seq. for environmental studies.

FIGURES

Vicinity Map

San Juan School

100 Nyland Drive

San Juan Bautista, California 95045

FIGURE 1

McCloskey Consultants

Site Plan

San Juan School
100 Nyland Drive
San Juan Bautista, California 95045

FIGURE 2

McCloskey Consultants

APPENDIX A

EDR REGULATORY AGENCY DATABASE REPORT

San Juan School
100 Nyland Drive
San Juan Bautista, CA 95045

Inquiry Number: 7330807.2s
May 08, 2023

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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GEOCHECK ADDENDUM

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

100 NYLAND DRIVE
SAN JUAN BAUTISTA, CA 95045

COORDINATES

Latitude (North):	36.8424760 - 36˚ 50' 32.91''
Longitude (West):	121.5328480 - 121˚ 31' 58.25''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	630817.4
UTM Y (Meters):	4078199.5
Elevation:	204 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	12021743 SAN JUAN BAUTISTA, CA
Version Date:	2018

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140609
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CA 95045

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	AROMAS SAN JUAN UNIF	100 NYLAND DR.	RCRA NonGen / NLR		TP
A2	AROMAS SAN JUAN UNIF	100 NYLAND DR.	FINDS		TP
A3	AROMAS SAN JUAN UNIF	100 NYLAND DR.	HAZNET, HWTS		TP
A4	AROMAS SAN JUAN USD,	100 NYLAND DR	HAZNET, HWTS		TP
A5	SAN JUAN UNION ELEME	100 NYLAND	HWTS		TP
A6	CITY OF SAN JUAN BAU	1100 3RD STREET	HWTS		TP
A7	1X SAN JUAN UNION EL	100 NYLAND DR	HAZNET, HWTS		TP
A8	AROMAS SAN JUAN UNIF	100 NYLAND DR.	ECHO		TP
B9	1X CHEVRON USA, STAT	300 THE ALAMEDA	HAZNET, HWTS	Higher	1 ft.
B10	1X CHEVRON USA, STAT	300 THE ALAMEDA	HAZNET, HWTS	Higher	1 ft.
B11	DIAS CHEVRON SERVICE	300 THE ALAMEDA	EDR Hist Auto	Higher	1 ft.
B12	95142	300 THE ALAMEDA	SWEEPS UST, HIST UST	Higher	1 ft.
A13	SAN JUAN DIAZ PIT		MINES MRDS	Lower	1 ft.
B14	CHEVRON PRODUCTS CO	300 THE ALAMEDA	HAZNET, HWTS	Higher	1 ft.
B15	CHEVRON SERVICE STAT	300 THE ALAMEDA	RGA LUST	Higher	1 ft.
B16	CHEVRON SERVICE STAT	300 ALAMEDA ST	LUST, Cortese, CERS	Higher	33, 0.006, WSW
B17	BRENDAS CLASSIC CLEA	301 THE ALAMEDA	EDR Hist Cleaner	Higher	81, 0.015, SW
C18	MASCOVICH PROPERTIES	106 THE ALAMEDA ST	LUST, Cortese, CERS	Higher	301, 0.057, WNW
19	MARLENE DWYER	87 4TH STREET	RCRA NonGen / NLR	Higher	321, 0.061, West
C20	MASCOVICH PROPERTIES	102 THE ALAMEDA	HIST CORTESE	Higher	479, 0.091, WNW
C21	J & K UNION SERVICE	101 THE ALAMEDA	LUST, SWEEPS UST, HIST UST	Higher	500, 0.095, WNW
C22	B & K UNION TOW SERV	101 THE ALAMEDA	HIST UST, HIST CORTESE	Higher	500, 0.095, WNW
C23	B & K UNION TOW SERV	101 THE ALAMEDA ST	LUST, Cortese, CERS	Higher	500, 0.095, WNW
D24	B & K UNION SERVICE	101 3RD ST	EDR Hist Auto	Higher	598, 0.113, WNW
D25	JANDK AUTO REPAIR	101 3RD ST	SWEEPS UST, HIST UST	Higher	598, 0.113, WNW
E26	CLAUDES BACKHOE SERV	113 FIFTH ST.	HIST UST	Higher	671, 0.127, WSW
E27	CLAUDES BACKHOE SERV	113 5TH ST	SWEEPS UST	Higher	671, 0.127, WSW
F28	SAN JUAN BAUTISTA ST	19 FRANKLIN ST	CUPA Listings, HAZNET, HWTS	Higher	724, 0.137, NNW
F29	JESSICA DUNAJSKI	19 FRANKLIN ST.	RCRA NonGen / NLR	Higher	724, 0.137, NNW
F30	STATE OF CALIFORNIA	19 FRANKLIN ST.	RCRA NonGen / NLR	Higher	724, 0.137, NNW
D31	PACIFIC BELL	110 THIRD STREET	RCRA-VSQG, HIST UST	Higher	780, 0.148, NW
D32	PACIFIC BELL (NE-087	110 3RD ST	SWEEPS UST	Higher	780, 0.148, NW
D33	AT&T CALIFORNIA - NE	110 THIRD ST	UST	Higher	780, 0.148, NW
D34	SBC SAN JUAN BAUTIST	110 3RD. STREET	UST	Higher	780, 0.148, NW
D35	AT&T CALIFORNIA - NE	110 THIRD ST	CUPA Listings	Higher	780, 0.148, NW
36	CITY OF SAN JUAN BAU	196 SAN JUAN HOLLIST	CUPA Listings, CERS	Lower	975, 0.185, ESE
G37	MIDNIGHT EXPRESS TRA	451 OLD SAN JUAN HOL	RCRA NonGen / NLR	Higher	1033, 0.196, SE
G38	MIDNIGHT EXPRESS TRA	451 OLD SAN JUAN HOL	RCRA NonGen / NLR	Higher	1033, 0.196, SE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 9 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
AROMAS SAN JUAN UNIF 100 NYLAND DR. SAN JUAN BAUTISTA, CA 95045	RCRA NonGen / NLR EPA ID:: CAC003025337	CAC003025337
AROMAS SAN JUAN UNIF 100 NYLAND DR. SAN JUAN BAUTISTA, CA 95045	FINDS	N/A
AROMAS SAN JUAN UNIF 100 NYLAND DR. SAN JUAN BAUTISTA, CA 95045	HAZNET GEPAID: CAC003025337 HWTS	N/A
AROMAS SAN JUAN USD, 100 NYLAND DR SAN JUAN BAUTISTA, CA 95045	HAZNET GEPAID: CAL000274374 HWTS	N/A
SAN JUAN UNION ELEME 100 NYLAND SAN JUAN BAUTISTA, CA 95045	HWTS	N/A
CITY OF SAN JUAN BAU 1100 3RD STREET SAN JUAN BAUTISTA, CA 95045	HWTS	N/A
1X SAN JUAN UNION EL 100 NYLAND DR SAN JUAN BUATISTA, CA 95045	HAZNET GEPAID: CAC000510152 HWTS	N/A
AROMAS SAN JUAN UNIF 100 NYLAND DR. SAN JUAN BAUTISTA, CA 95045	ECHO Registry ID: 110070588481	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL - National Priority List
Proposed NPL - Proposed National Priority List Sites
NPL LIENS - Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL - National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY - Federal Facility Site Information listing
SEMS - Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE - Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS - Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF - RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG - RCRA - Large Quantity Generators
RCRA-SQG - RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

LUCIS - Land Use Control Information System
US ENG CONTROLS - Engineering Controls Sites List
US INST CONTROLS - Institutional Controls Sites List

Federal ERNS list

ERNS - Emergency Response Notification System

Lists of state- and tribal (Superfund) equivalent sites

RESPONSE - State Response Sites

EXECUTIVE SUMMARY

Lists of state- and tribal hazardous waste facilities

ENVIROSTOR.............. EnviroStor Database

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF.............. Solid Waste Information System

Lists of state and tribal leaking storage tanks

INDIAN LUST.............. Leaking Underground Storage Tanks on Indian Land
CPS-SLIC.............. Statewide SLIC Cases

Lists of state and tribal registered storage tanks

FEMA UST.............. Underground Storage Tank Listing
AST.............. Aboveground Petroleum Storage Tank Facilities
INDIAN UST.............. Underground Storage Tanks on Indian Land

Lists of state and tribal voluntary cleanup sites

INDIAN VCP.............. Voluntary Cleanup Priority Listing
VCP.............. Voluntary Cleanup Program Properties

Lists of state and tribal brownfield sites

BROWNFIELDS.............. Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS.............. A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT.............. Waste Management Unit Database
SWRCY.............. Recycler Database
HAULERS.............. Registered Waste Tire Haulers Listing
INDIAN ODI.............. Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9.............. Torres Martinez Reservation Illegal Dump Site Locations
ODI.............. Open Dump Inventory
IHS OPEN DUMPS.............. Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL.............. Delisted National Clandestine Laboratory Register
HIST Cal-Sites.............. Historical Calsites Database
SCH.............. School Property Evaluation Program
CDL.............. Clandestine Drug Labs
CERS HAZ WASTE.............. CERS HAZ WASTE
Toxic Pits.............. Toxic Pits Cleanup Act Sites
US CDL.............. National Clandestine Laboratory Register

EXECUTIVE SUMMARY

Local Lists of Registered Storage Tanks

CA FID UST - Facility Inventory Database
CERS TANKS - California Environmental Reporting System (CERS) Tanks

Local Land Records

LIENS - Environmental Liens Listing
LIENS 2 - CERCLA Lien Information
DEED - Deed Restriction Listing

Records of Emergency Release Reports

HMIRS - Hazardous Materials Information Reporting System
CHMIRS - California Hazardous Material Incident Report System
LDS - Land Disposal Sites Listing
MCS - Military Cleanup Sites Listing
SPILLS 90 - SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS - Formerly Used Defense Sites
DOD - Department of Defense Sites
SCRD DRYCLEANERS - State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR - Financial Assurance Information
EPA WATCH LIST - EPA WATCH LIST
2020 COR ACTION - 2020 Corrective Action Program List
TSCA - Toxic Substances Control Act
TRIS - Toxic Chemical Release Inventory System
SSTS - Section 7 Tracking Systems
ROD - Records Of Decision
RMP - Risk Management Plans
RAATS - RCRA Administrative Action Tracking System
PRP - Potentially Responsible Parties
PADS - PCB Activity Database System
ICIS - Integrated Compliance Information System
FTTS - FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS - Material Licensing Tracking System
COAL ASH DOE - Steam-Electric Plant Operation Data
COAL ASH EPA - Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER - PCB Transformer Registration Database
RADINFO - Radiation Information Database
HIST FTTS - FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS - Incident and Accident Data
CONSENT - Superfund (CERCLA) Consent Decrees
INDIAN RESERV - Indian Reservations
FUSRAP - Formerly Utilized Sites Remedial Action Program
UMTRA - Uranium Mill Tailings Sites
LEAD SMELTERS - Lead Smelter Sites
US AIRS - Aerometric Information Retrieval System Facility Subsystem
US MINES - Mines Master Index File
ABANDONED MINES - Abandoned Mines
DOCKET HWC - Hazardous Waste Compliance Docket Listing

EXECUTIVE SUMMARY

UXO	Unexploded Ordnance Sites
FUELS PROGRAM	EPA Fuels Program Registered Listing
PFAS NPL	Superfund Sites with PFAS Detections Information
PFAS FEDERAL SITES	Federal Sites PFAS Information
PFAS TSCA	PFAS Manufacture and Imports Information
PFAS RCRA MANIFEST	PFAS Transfers Identified In the RCRA Database Listing
PFAS ATSDR	PFAS Contamination Site Location Listing
PFAS WQP	Ambient Environmental Sampling for PFAS
PFAS NPDES	Clean Water Act Discharge Monitoring Information
PFAS ECHO	Facilities in Industries that May Be Handling PFAS Listing
PFAS ECHO FIRE TRAINING	Facilities in Industries that May Be Handling PFAS Listing
PFAS PART 139 AIRPORT	All Certified Part 139 Airports PFAS Information Listing
AQUEOUS FOAM NRC	Aqueous Foam Related Incidents Listing
PFAS	PFAS Contamination Site Location Listing
AQUEOUS FOAM	Former Fire Training Facility Assessments Listing
CA BOND EXP. PLAN	Bond Expenditure Plan
DRYCLEANERS	Cleaner Facilities
EMI	Emissions Inventory Data
ENF	Enforcement Action Listing
Financial Assurance	Financial Assurance Information Listing
ICE	ICE
HWP	EnviroStor Permitted Facilities Listing
HWT	Registered Hazardous Waste Transporter Database
MINES	Mines Site Location Listing
MWMP	Medical Waste Management Program Listing
NPDES	NPDES Permits Listing
PEST LIC	Pesticide Regulation Licenses Listing
PROC	Certified Processors Database
Notify 65	Proposition 65 Records
HAZMAT	Hazardous Material Facilities
UIC	UIC Listing
UIC GEO	UIC GEO (GEOTRACKER)
WASTEWATER PITS	Oil Wastewater Pits Listing
WDS	Waste Discharge System
WIP	Well Investigation Program Case List
MILITARY PRIV SITES	MILITARY PRIV SITES (GEOTRACKER)
PROJECT	PROJECT (GEOTRACKER)
WDR	Waste Discharge Requirements Listing
CIWQS	California Integrated Water Quality System
CERS	CERS
NON-CASE INFO	NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS	OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS	PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT	SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ	Well Stimulation Project (GEOTRACKER)
PFAS TRIS	List of PFAS Added to the TRI

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	Recovered Government Archive Solid Waste Facilities List

EXECUTIVE SUMMARY

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal RCRA generators

RCRA-VSQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-VSQG list, as provided by EDR, and dated 03/06/2023 has revealed that there is 1 RCRA-VSQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PACIFIC BELL	***110 THIRD STREET***	***NW 1/8 - 1/4 (0.148 mi.)***	***D31***	***69***
EPA ID:: CAT080022486				

Lists of state and tribal leaking storage tanks

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON SERVICE STAT	***300 ALAMEDA ST***	***WSW 0 - 1/8 (0.006 mi.)***	***B16***	***28***
Database: LUST REG 3, Date of Government Version: 05/19/2003 Database: LUST, Date of Government Version: 03/06/2023 Status: Completed - Case Closed Status: Case Closed Global Id: T0606900026 Global ID: T0606900026				
MASCOVICH PROPERTIES	***106 THE ALAMEDA ST***	***WNW 0 - 1/8 (0.057 mi.)***	***C18***	***32***
Database: LUST REG 3, Date of Government Version: 05/19/2003 Database: LUST, Date of Government Version: 03/06/2023				

Status: Completed - Case Closed
Status: Post remedial action monitoring
Global Id: T0606900051
Global ID: T0606900051

J & K UNION SERVICE	***101 THE ALAMEDA***	***WNW 0 - 1/8 (0.095 mi.)***	***C21***	***39***

Database: LUST, Date of Government Version: 03/06/2023
Status: Completed - Case Closed
Global Id: T0606900024

B & K UNION TOW SERV	***101 THE ALAMEDA ST***	***WNW 0 - 1/8 (0.095 mi.)***	***C23***	***53***

Database: LUST REG 3, Date of Government Version: 05/19/2003
Status: Post remedial action monitoring
Global ID: T0606900024

Lists of state and tribal registered storage tanks

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AT&T CALIFORNIA - NE	110 THIRD ST	NW 1/8 - 1/4 (0.148 mi.)	D33	73

Database: UST, Date of Government Version: 12/02/2022
Facility Id: 08-061

SBC SAN JUAN BAUTIST	110 3RD. STREET	NW 1/8 - 1/4 (0.148 mi.)	D34	74

Database: UST, Date of Government Version: 12/02/2022
Facility Id: 35-03-03

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 5 SWEEPS UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
95142	***300 THE ALAMEDA***	***0 - 1/8 (0.000 mi.)***	***B12***	***24***

Status: A
Tank Status: A
Comp Number: 62714

J & K UNION SERVICE	***101 THE ALAMEDA***	***WNW 0 - 1/8 (0.095 mi.)***	***C21***	***39***

Status: A Tank Status: A Comp Number: 66509				
JANDK AUTO REPAIR Status: A Tank Status: A Comp Number: 57668	***101 3RD ST***	***WNW 0 - 1/8 (0.113 mi.)***	***D25***	***55***
CLAUDES BACKHOE SERV Status: A Tank Status: A Comp Number: 46599	113 5TH ST	WSW 1/8 - 1/4 (0.127 mi.)	E27	59
PACIFIC BELL (NE-087 Status: A Tank Status: A Comp Number: 16379	110 3RD ST	NW 1/8 - 1/4 (0.148 mi.)	D32	72

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 6 HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
95142 Facility Id: 00000062714	***300 THE ALAMEDA***	***0 - 1/8 (0.000 mi.)***	***B12***	***24***
J & K UNION SERVICE Facility Id: 00000066509	***101 THE ALAMEDA***	***WNW 0 - 1/8 (0.095 mi.)***	***C21***	***39***
B & K UNION TOW SERV	***101 THE ALAMEDA***	***WNW 0 - 1/8 (0.095 mi.)***	***C22***	***52***
JANDK AUTO REPAIR Facility Id: 00000057668	***101 3RD ST***	***WNW 0 - 1/8 (0.113 mi.)***	***D25***	***55***
CLAUDES BACKHOE SERV Facility Id: 00000046599	113 FIFTH ST.	WSW 1/8 - 1/4 (0.127 mi.)	E26	59
PACIFIC BELL Facility Id: 00000016379	***110 THIRD STREET***	***NW 1/8 - 1/4 (0.148 mi.)***	***D31***	***69***

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/06/2023 has revealed that there are 5 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARLENE DWYER	87 4TH STREET	W 0 - 1/8 (0.061 mi.)	19	37

EPA ID:: CAC003103097				
JESSICA DUNAJSKI EPA ID:: CAC003152597	19 FRANKLIN ST.	NNW 1/8 - 1/4 (0.137 mi.)	F29	65
STATE OF CALIFORNIA EPA ID:: CAC003152881	19 FRANKLIN ST.	NNW 1/8 - 1/4 (0.137 mi.)	F30	67
MIDNIGHT EXPRESS TRA EPA ID:: CAC003085234	451 OLD SAN JUAN HOL	SE 1/8 - 1/4 (0.196 mi.)	G37	80
MIDNIGHT EXPRESS TRA EPA ID:: CAC003151522 EPA ID:: CAC003040326	451 OLD SAN JUAN HOL	SE 1/8 - 1/4 (0.196 mi.)	G38	82

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 12/14/2022 has revealed that there are 3 Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON SERVICE STAT Cleanup Status: COMPLETED - CASE CLOSED	***300 ALAMEDA ST***	***WSW 0 - 1/8 (0.006 mi.)***	***B16***	***28***
MASCOVICH PROPERTIES Cleanup Status: COMPLETED - CASE CLOSED	***106 THE ALAMEDA ST***	***WNW 0 - 1/8 (0.057 mi.)***	***C18***	***32***
B & K UNION TOW SERV Cleanup Status: COMPLETED - CASE CLOSED	***101 THE ALAMEDA ST***	***WNW 0 - 1/8 (0.095 mi.)***	***C23***	***53***

CUPA Listings: A listing of sites included in the county’s Certified Unified Program Agency database. California’s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

A review of the CUPA Listings list, as provided by EDR, has revealed that there are 3 CUPA Listings sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SAN JUAN BAUTISTA ST Database: CUPA SAN BENITO, Date of Government Version: 02/08/2023	***19 FRANKLIN ST***	***NNW 1/8 - 1/4 (0.137 mi.)***	***F28***	***60***
AT&T CALIFORNIA - NE Database: CUPA SAN BENITO, Date of Government Version: 02/08/2023	110 THIRD ST	NW 1/8 - 1/4 (0.148 mi.)	D35	75

Lower Elevation	Address	Direction / Distance	Map ID	Page
CITY OF SAN JUAN BAU Database: CUPA SAN BENITO, Date of Government Version: 02/08/2023	***196 SAN JUAN HOLLIST***	***ESE 1/8 - 1/4 (0.185 mi.)***	***36***	***76***

EXECUTIVE SUMMARY

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MASCOVICH PROPERTIES Reg Id: 992	102 THE ALAMEDA	WNW 0 - 1/8 (0.091 mi.)	C20	39
B & K UNION TOW SERV Reg Id: 679	***101 THE ALAMEDA***	***WNW 0 - 1/8 (0.095 mi.)***	***C22***	***52***

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency. This database begins with calendar year 1993.

A review of the HAZNET list, as provided by EDR, and dated 12/31/2021 has revealed that there are 3 HAZNET sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
1X CHEVRON USA, STAT GEPAID: CAC000209923	***300 THE ALAMEDA***	***0 - 1/8 (0.000 mi.)***	***B9***	***21***
1X CHEVRON USA, STAT GEPAID: CAC000189648	***300 THE ALAMEDA***	***0 - 1/8 (0.000 mi.)***	***B10***	***22***
CHEVRON PRODUCTS CO GEPAID: CAL000041622	***300 THE ALAMEDA***	***0 - 1/8 (0.000 mi.)***	***B14***	***27***

MINES MRDS: Mineral Resources Data System

A review of the MINES MRDS list, as provided by EDR, and dated 08/23/2022 has revealed that there is 1 MINES MRDS site within approximately 0.001 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAN JUAN DIAZ PIT		0 - 1/8 (0.000 mi.)	A13	26

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR’s HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 2 EDR Hist Auto sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DIAS CHEVRON SERVICE	300 THE ALAMEDA	0 - 1/8 (0.000 mi.)	B11	23
B & K UNION SERVICE	101 3RD ST	WNW 0 - 1/8 (0.113 mi.)	D24	55

EDR Hist Cleaner: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR’s review was limited to those categories of sources that might, in EDR’s opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR’s HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Cleaner list, as provided by EDR, has revealed that there is 1 EDR Hist Cleaner site within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BRENDAS CLASSIC CLEA	301 THE ALAMEDA	SW 0 - 1/8 (0.015 mi.)	B17	32

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST: The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

A review of the RGA LUST list, as provided by EDR, has revealed that there is 1 RGA LUST site within approximately 0.001 miles of the target property.

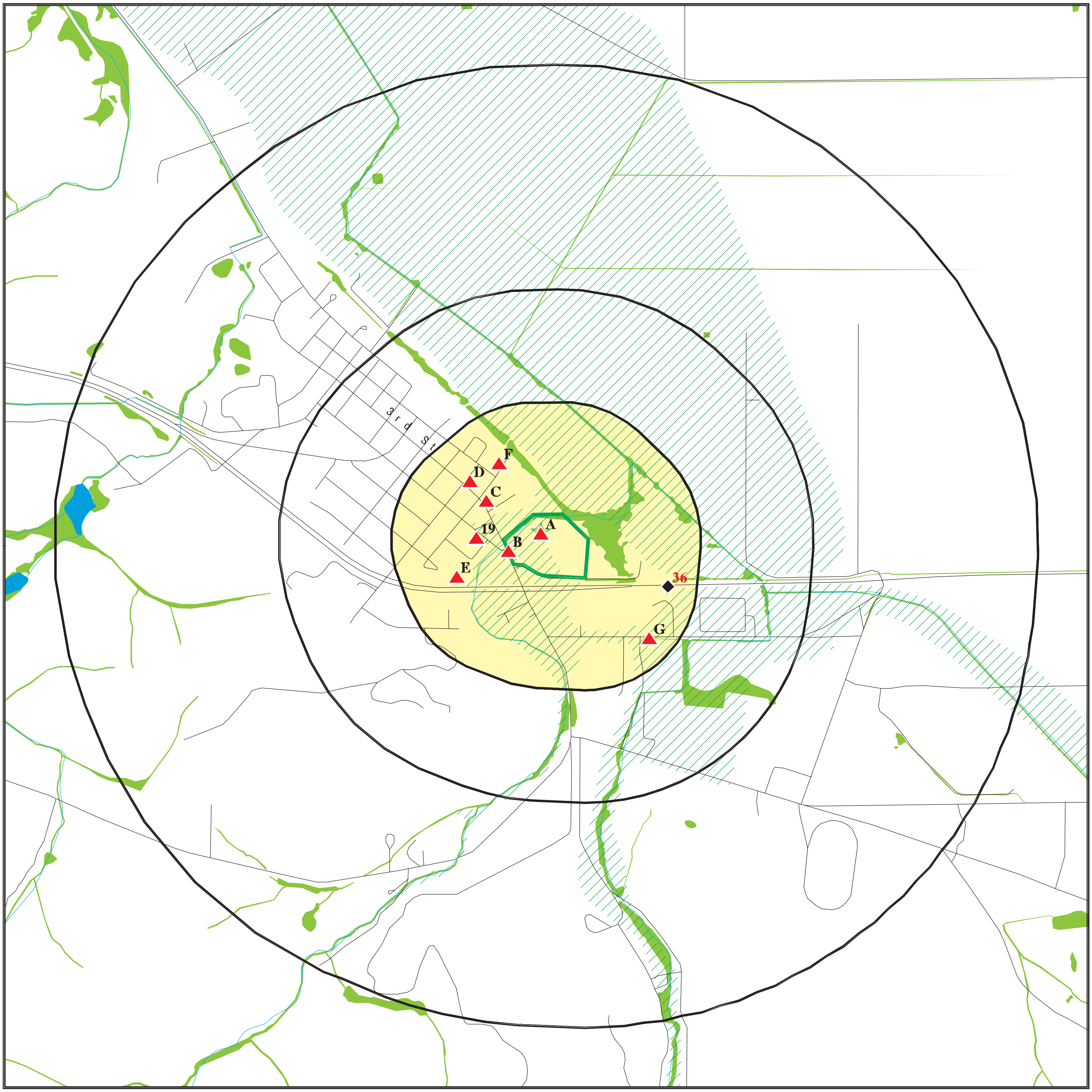
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON SERVICE STAT	300 THE ALAMEDA	0 - 1/8 (0.000 mi.)	B15	28

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 15 records.

Site Name	Database(s)
SAN JUAN HIGHWAY AT CHITTENDEN	CIWQS
SAN JUAN HIGHWAY	NPDES
CITY OF SAN JUAN BAUTISTA	CUPA Listings
DOMESTIC WASTE TREATMENT FACILITY	SWF/LF
BOTELHO BROTHERS PROPERTY	SWF/LF
AROMAS SAN JUAN UNIFIED SCHOOL DIS	RCRA NonGen / NLR
AROMAS SAN JUAN UNIFIED SCHOOL	RCRA NonGen / NLR
AROMAS/SAN JUAN HIGH SCHOOL	FINDS
SAN JUAN UNION ELEMENTARY SD	FINDS
AROMAS SAN JUAN UNIFIED SCHOOL	FINDS
CITY OF SAN JUAN BAUTISTA	FINDS
RMC PAC MATERIALS INC SAN JUAN	WDS
SAN JUAN PIT MILL	US MINES, ABANDONED MINES
OLD SAN JUAN DUMP	RGA LF
OLD SAN JUAN DUMP	RGA LF

OVERVIEW MAP - 7330807.2S



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
National Priority List Sites
Dept. Defense Sites

0 1/4 1/2 1 Miles

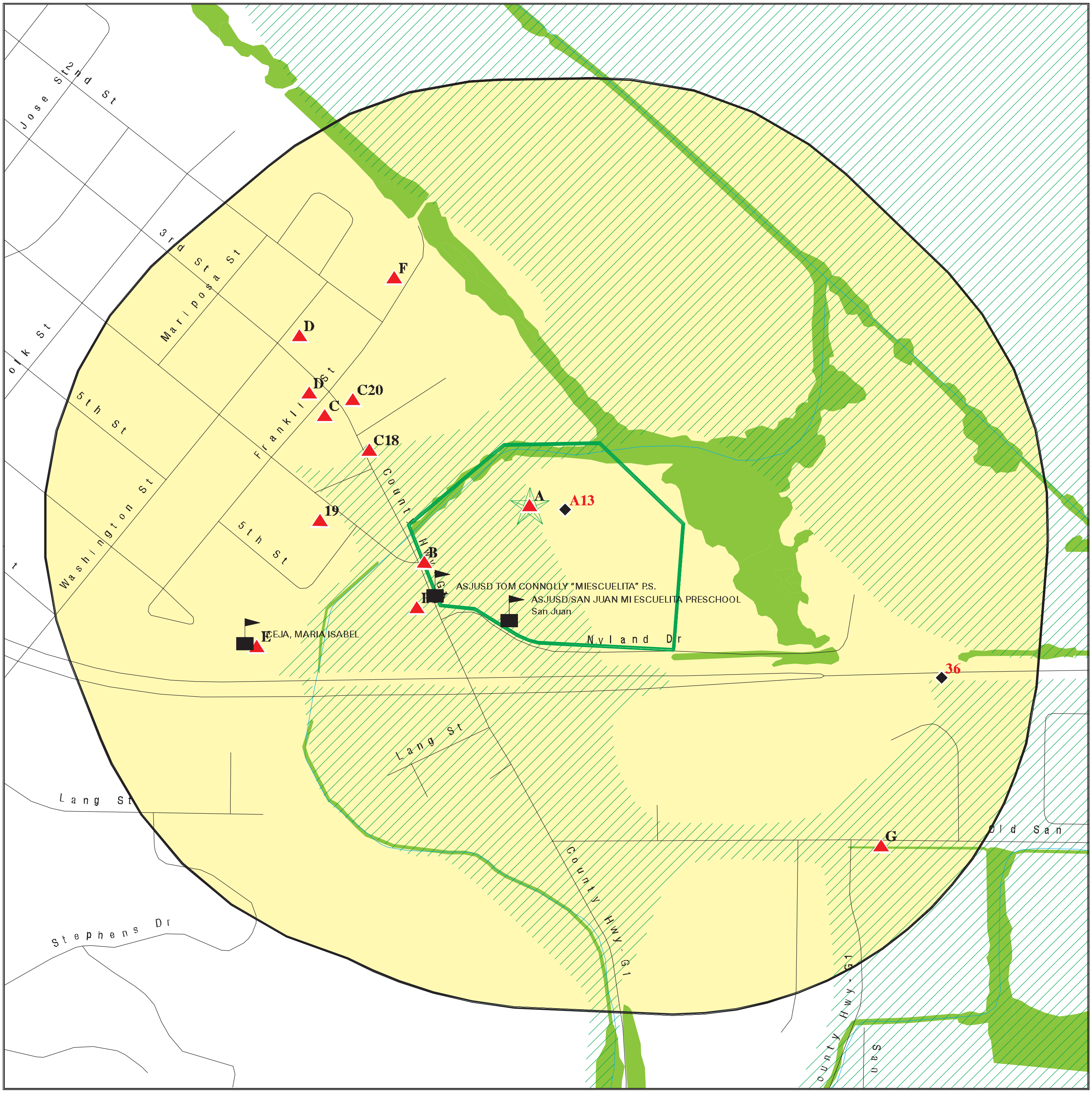
Indian Reservations BIA
Special Flood Hazard Area (1%)
0.2% Annual Chance Flood Hazard
National Wetland Inventory
State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: San Juan School ADDRESS: 100 Nyland Drive San Juan Bautista CA 95045 LAT/LONG: 36.842476 / 121.532848	CLIENT: McCloskey Consultants Inc CONTACT: Belinda Blackie INQUIRY #: 7330807.2s DATE: May 08, 2023 7:42 pm

DETAIL MAP - 7330807.2S



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

Indian Reservations BIA
Special Flood Hazard Area (1%)
0.2% Annual Chance Flood Hazard
National Wetland Inventory
State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	San Juan School	CLIENT:	McCloskey Consultants Inc
ADDRESS:	100 Nyland Drive	CONTACT:	Belinda Blackie
	San Juan Bautista CA 95045	INQUIRY #:	7330807.2s
LAT/LONG:	36.842476 / 121.532848	DATE:	May 08, 2023 7:43 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	1	NR	NR	NR	1
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
Lists of state- and tribal (Superfund) equivalent sites								
RESPONSE	1.000		0	0	0	0	NR	0
Lists of state- and tribal hazardous waste facilities								
ENVIROSTOR	1.000		0	0	0	0	NR	0
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Lists of state and tribal leaking storage tanks								
LUST	0.500		4	0	0	NR	NR	4
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	2	NR	NR	NR	2
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		3	2	NR	NR	NR	5
HIST UST	0.250		4	2	NR	NR	NR	6
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250	1	1	4	NR	NR	NR	6
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001	1	0	NR	NR	NR	NR	1
ECHO	0.001	1	0	NR	NR	NR	NR	1
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		0	0	NR	NR	NR	0
PFAS ECHO FIRE TRAINING	0.250		0	0	NR	NR	NR	0
PFAS PART 139 AIRPORT	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		3	0	0	NR	NR	3
CUPA Listings	0.250		0	3	NR	NR	NR	3
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		2	0	0	NR	NR	2
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HAZNET	0.001	3	3	NR	NR	NR	NR	6
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
HAZMAT	0.250		0	0	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0
MINES MRDS	0.001		1	NR	NR	NR	NR	1
HWTS	TP	5	NR	NR	NR	NR	NR	5

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	0.125		2	NR	NR	NR	NR	2
EDR Hist Cleaner	0.125		1	NR	NR	NR	NR	1
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		1	NR	NR	NR	NR	1
- Totals --		11	25	14	0	0	0	50

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1	**AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT**	**RCRA NonGen / NLR**	**1025845714**
Target	**100 NYLAND DR.**		**CAC003025337**
Property	**SAN JUAN BAUTISTA, CA 95045**		

Site 1 of 9 in cluster A

Actual:
204 ft.

RCRA Listings:

Date Form Received by Agency:	20190723
Handler Name:	Aromas San Juan Unified School District
Handler Address:	100 NYLAND DR.
Handler City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC003025337
Contact Name:	WILLIAM RUPERT
Contact Address:	2320 SAN JUAN HWY.
Contact City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact Telephone:	831-623-4500
Contact Fax:	Not reported
Contact Email:	BRUPERT@ASDUSD.K12.CA.US
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	2320 SAN JUAN HWY.
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner Name:	Aromas San Juan Unified School Dist
Owner Type:	Other
Operator Name:	William Rupert
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No

AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT (Continued) **1025845714**

Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20190729
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name:	AROMAS SAN JUAN UNIFIED SCHOOL DIST
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	2320 SAN JUAN HWY.
Owner/Operator City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner/Operator Telephone:	831-623-4500
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name:	WILLIAM RUPERT
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	2320 SAN JUAN HWY.
Owner/Operator City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner/Operator Telephone:	831-623-4500
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20190723
Handler Name:	AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT (Continued) **1025845714**

List of NAICS Codes and Descriptions:
NAICS Code: 611110
NAICS Description: ELEMENTARY AND SECONDARY SCHOOLS

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

A2
Target
Property
AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT **FINDS** **1025978146**
100 NYLAND DR. **N/A**
SAN JUAN BAUTISTA, CA 95045

Site 2 of 9 in cluster A

Actual:
204 ft.

FINDS:
Registry ID: 110070588481

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

A3
Target
Property
AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT **HAZNET** **S125531659**
100 NYLAND DR. **HWTS** **N/A**
SAN JUAN BAUTISTA, CA 95045

Site 3 of 9 in cluster A

Actual:
204 ft.

HAZNET:
Name: AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT
Address: 100 NYLAND DR.
Address 2: Not reported
City,State,Zip: SAN JUAN BAUTISTA, CA 95045
Contact: WILLIAM RUPERT
Telephone: 8316234500
Mailing Name: Not reported
Mailing Address: 2320 SAN JUAN HWY.

Year: 2019
Gepaid: CAC003025337
TSD EPA ID: CAL000190080
CA Waste Code: 151 - Asbestos containing waste
Disposal Method: H132 - Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Tons: 0.23000

AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT (Continued) **S125531659**

HWTS:

Name:	AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT
Address:	100 NYLAND DR.
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC003025337
Inactive Date:	10/22/2019
Create Date:	07/23/2019
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	2320 SAN JUAN HWY.
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner Name:	AROMAS SAN JUAN UNIFIED SCHOOL DIST
Owner Address:	2320 SAN JUAN HWY.
Owner Address 2:	Not reported
Owner City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact Name:	WILLIAM RUPERT
Contact Address:	2320 SAN JUAN HWY.
Contact Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.841408
Longitude:	-121.533928

NAICS:

EPA ID:	CAC003025337
Create Date:	2019-07-23 11:11:45.477
NAICS Code:	611110
NAICS Description:	Elementary and Secondary Schools
Issued EPA ID Date:	2019-07-23 11:11:45.48000
Inactive Date:	2019-10-22 11:11:45.44700
Facility Name:	AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT
Facility Address:	100 NYLAND DR.
Facility Address 2:	Not reported
Facility City:	SAN JUAN BAUTISTA
Facility County:	Not reported
Facility State:	CA
Facility Zip:	95045

A4	**AROMAS SAN JUAN USD, SAN JUAN SCHOOL**	**HAZNET**	**S113128210**
Target	**100 NYLAND DR**	**HWTS**	**N/A**
Property	**SAN JUAN BAUTISTA, CA 95045**		

Site 4 of 9 in cluster A

Actual:
204 ft.

HAZNET:

Name:	AROMAS SAN JUAN USD, SAN JUAN SCHOOL
Address:	100 NYLAND DR
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 950459573
Contact:	JOSEPH REYES
Telephone:	8316234776
Mailing Name:	Not reported
Mailing Address:	2320 SAN JUAN HWY

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Year:	2005
Gepaid:	CAL000274374
TSD EPA ID:	CAD028409019
CA Waste Code:	352 - Other organic solids
Disposal Method:	H01 - Transfer Station
Tons:	0.08
Year:	2004
Gepaid:	CAL000274374
TSD EPA ID:	CAD981382732
CA Waste Code:	151 - Asbestos containing waste
Disposal Method:	D80 - Disposal, Land Fill
Tons:	23.5984
Year:	2004
Gepaid:	CAL000274374
TSD EPA ID:	CAD028409019
CA Waste Code:	352 - Other organic solids
Disposal Method:	H01 - Transfer Station
Tons:	0.785
Year:	2004
Gepaid:	CAL000274374
TSD EPA ID:	CAD982042475
CA Waste Code:	151 - Asbestos containing waste
Disposal Method:	D80 - Disposal, Land Fill
Tons:	133.1624

Additional Info:

Year:	2005
Gen EPA ID:	CAL000274374
Shipment Date:	20050105
Creation Date:	1/3/2007 18:30:08
Receipt Date:	20050118
Manifest ID:	23301906
Trans EPA ID:	CAL000227706
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	CAD983668583
Trans 2 Name:	CONSOLIDATED WASTE IND
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON INC
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.04
Waste Quantity:	80
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Shipment Date:	20050105
Creation Date:	4/20/2006 18:30:56
Receipt Date:	20050118
Manifest ID:	23301906
Trans EPA ID:	CAL000027706
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	CAD983668583
Trans 2 Name:	CONSOLIDATED WASTE IND
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON INC
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.04
Waste Quantity:	80
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2004
Gen EPA ID:	CAL000274374

Shipment Date:	20041117
Creation Date:	1/20/2005 18:31:32
Receipt Date:	20041123
Manifest ID:	23301905
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982042475
Trans Name:	NWS HAY ROAD LANDFILL
TSDF Alt EPA ID:	CAD982042475
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	33.712
Waste Quantity:	40
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040713
Creation Date:	11/1/2004 12:36:11
Receipt Date:	20040720
Manifest ID:	23301805
Trans EPA ID:	CAL000224869

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD981382732
Trans Name:	ALTAMONT LANDFILL
TSDF Alt EPA ID:	CAD981382732
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	16.856
Waste Quantity:	20
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040713
Creation Date:	11/5/2004 18:30:59
Receipt Date:	20040803
Manifest ID:	23301798
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982042475
Trans Name:	NWS HAY ROAD LANDFILL
TSDF Alt EPA ID:	CAD982042475
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	16.856
Waste Quantity:	20
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040713
Creation Date:	1/4/2005 18:33:27
Receipt Date:	20040803
Manifest ID:	23301792
Trans EPA ID:	CAL000027706
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	CAD983668583
Trans 2 Name:	CONSOLIDATED WASTE IND
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON INC
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Meth Code:	H01 - Transfer Station
Quantity Tons:	0.29
Waste Quantity:	580
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040713
Creation Date:	11/1/2004 12:36:11
Receipt Date:	20040720
Manifest ID:	23301762
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD981382732
Trans Name:	ALTAMONT LANDFILL
TSDF Alt EPA ID:	CAD981382732
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	6.7424
Waste Quantity:	8
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040708
Creation Date:	11/5/2004 18:30:59
Receipt Date:	20040715
Manifest ID:	23301730
Trans EPA ID:	CAL000027706
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	CAD983668583
Trans 2 Name:	CONSOLIDATED WASTE IND
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON INC
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.42
Waste Quantity:	840
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Shipment Date:	20040510
Creation Date:	10/14/2004 15:19:37
Receipt Date:	20040510
Manifest ID:	23301755
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS M MT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982042475
Trans Name:	NWS HAY ROAD LANDFILL
TSDF Alt EPA ID:	CAD982042475
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	33.712
Waste Quantity:	40
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040505
Creation Date:	10/14/2004 15:19:37
Receipt Date:	20040505
Manifest ID:	23301729
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982042475
Trans Name:	B&J SANITARY LANDFILL
TSDF Alt EPA ID:	CAD982042475
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	18.5416
Waste Quantity:	22
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040322
Creation Date:	10/14/2004 7:49:48
Receipt Date:	20040414
Manifest ID:	23301675
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	CAD983668583
Trans 2 Name:	CONSOLIDATED WASTE INDUSTRIES
TSDF EPA ID:	CAD028409019

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Trans Name:	CROSBY & OVERTON INC
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.075
Waste Quantity:	150
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20040128
Creation Date:	8/19/2004 11:23:00
Receipt Date:	20040128
Manifest ID:	23301667
Trans EPA ID:	CAL000224869
Trans Name:	ASBESTOS MGMT GROUP OF CA INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982042475
Trans Name:	B&J SANITARY LANDFILL
TSDF Alt EPA ID:	CAD982042475
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	15.1704
Waste Quantity:	18
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

HWTS:

Name:	AROMAS SAN JUAN USD, SAN JUAN SCHOOL
Address:	100 NYLAND DR
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAL000274374
Inactive Date:	11/03/2004
Create Date:	09/05/2003
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	2320 SAN JUAN HWY
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 950459557
Owner Name:	AROMAS SAN JUAN UNIFIED SCHOOL DIST
Owner Address:	2320 SAN JUAN HWY
Owner Address 2:	Not reported
Owner City,State,Zip:	SAN JUAN BAUTISTA, CA 950459557
Contact Name:	JOSEPH REYES

AROMAS SAN JUAN USD, SAN JUAN SCHOOL (Continued) **S113128210**

Contact Address:	1731 VALLEY VIEW RD
Contact Address 2:	Not reported
City,State,Zip:	HOLLISTER, CA 95023
Facility Status:	Inactive
Facility Type:	PERMANENT
Category:	STATE
Latitude:	36.841365
Longitude:	-121.533916

NAICS:

EPA ID:	CAL000274374
Create Date:	2006-01-04 13:28:52.717
NAICS Code:	61111
NAICS Description:	Elementary and Secondary Schools
Issued EPA ID Date:	2003-09-05 12:30:04.73000
Inactive Date:	2004-11-03 00:00:00
Facility Name:	AROMAS SAN JUAN USD, SAN JUAN SCHOOL
Facility Address:	100 NYLAND DR
Facility Address 2:	Not reported
Facility City:	SAN JUAN BAUTISTA
Facility County:	Not reported
Facility State:	CA
Facility Zip:	950459573

A5 **SAN JUAN UNION ELEMENTARY USD** **HWTS** **S124547404**
Target **100 NYLAND** **N/A**
Property **SAN JUAN BAUTISTA, CA 95045**

Site 5 of 9 in cluster A

Actual:
204 ft.

HWTS:

Name:	SAN JUAN UNION ELEMENTARY USD
Address:	100 NYLAND
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC001025448
Inactive Date:	10/25/2000
Create Date:	09/29/1994
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX 2000
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Owner Name:	AROMAS SAN JUAN USD
Owner Address:	PO BOX 2000
Owner Address 2:	Not reported
Owner City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Contact Name:	JERRY BLOOM/SUPERIDENT
Contact Address:	PO BOX 2000
Contact Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.841365
Longitude:	-121.533915

A6 **CITY OF SAN JUAN BAUTISTA** **HWTS** **S124548774**
Target **1100 3RD STREET** **N/A**
Property **SAN JUAN BAUTISTA, CA 95045**

Site 6 of 9 in cluster A

Actual:
204 ft.

HWTS:

Name:	CITY OF SAN JUAN BAUTISTA
Address:	1100 3RD STREET
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC001069472
Inactive Date:	10/25/2000
Create Date:	03/01/1995
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	1100 3RD STREET
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Owner Name:	Not reported
Owner Address:	Not reported
Owner Address 2:	Not reported
Owner City,State,Zip:	Not reported
Contact Name:	DENNIS MCDUFFIE/CITY MANAGER
Contact Address:	1100 3RD STREET
Contact Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.848319
Longitude:	-121.542484

A7 **1X SAN JUAN UNION ELEMENTARY SCH DIST** **HAZNET** **S123729744**
Target **100 NYLAND DR** **HWTS** **N/A**
Property **SAN JUAN BUATISTA, CA 95045**

Site 7 of 9 in cluster A

Actual:
204 ft.

HAZNET:

Name:	1X SAN JUAN UNION ELEMENTARY SCH DIST
Address:	100 NYLAND DR
Address 2:	Not reported
City,State,Zip:	SAN JUAN BUATISTA, CA 950450000
Contact:	LOU BECKER, PRINCIPAL
Telephone:	4086234538
Mailing Name:	Not reported
Mailing Address:	PO BOX DRAWER A

Year:	1990
Gepaid:	CAC000510152
TSD EPA ID:	CAD981388952
CA Waste Code:	151 - Asbestos containing waste
Disposal Method:	D80 - Disposal, Land Fill
Tons:	1.3

HWTS:

Name:	1X SAN JUAN UNION ELEMENTARY SCH DIST

1X SAN JUAN UNION ELEMENTARY SCH DIST (Continued) **S123729744**

Address:	100 NYLAND DR
Address 2:	Not reported
City,State,Zip:	SAN JUAN BUATISTA, CA 95045
EPA ID:	CAC000510152
Inactive Date:	10/25/2000
Create Date:	08/20/1990
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX DRAWER A
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Owner Name:	SAN JUAN UNIF ELEM SCH DIST
Owner Address:	Not reported
Owner Address 2:	Not reported
Owner City,State,Zip:	Not reported
Contact Name:	LOU BECKER, PRINCIPAL
Contact Address:	Not reported
Contact Address 2:	Not reported
City,State,Zip:	Not reported
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.841365
Longitude:	-121.533916

A8
Target
Property

AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT **ECHO** **1025908535**
100 NYLAND DR. **N/A**
SAN JUAN BAUTISTA, CA 95045

Site 8 of 9 in cluster A

Actual:
204 ft.

ECHO:

Envid:	1025908535
Registry ID:	110070588481
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110070588481
Name:	AROMAS SAN JUAN UNIFIED SCHOOL DISTRICT
Address:	100 NYLAND DR.
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045

B9

< 1/8
1 ft.

1X CHEVRON USA, STATION #0-095142 **HAZNET** **S123720577**
300 THE ALAMEDA **HWTS** **N/A**
SAN JUAN BAUTISTA, CA 95045

Site 1 of 8 in cluster B

Relative:
Higher

Actual:
207 ft.

HAZNET:

Name:	1X CHEVRON USA, STATION #0-095142
Address:	300 THE ALAMEDA
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 950450000
Contact:	HEATHER HEATH, MARKETING ASSIS
Telephone:	4158429598
Mailing Name:	Not reported
Mailing Address:	P.O. BOX 5004
Year:	1989

1X CHEVRON USA, STATION #0-095142 (Continued) **S123720577**

Gepaid:	CAC000209923
TSD EPA ID:	CAD980883177
CA Waste Code:	223 - Unspecified oil-containing waste
Disposal Method:	R01 - Recycler
Tons:	0.1251

HWTS:

Name:	1X CHEVRON USA, STATION #0-095142
Address:	300 THE ALAMEDA
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC000209923
Inactive Date:	10/25/2000
Create Date:	10/10/1989
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	P.O. BOX 5004
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN RAMON, CA 945830804
Owner Name:	CHEVRON USA, INC.
Owner Address:	Not reported
Owner Address 2:	Not reported
Owner City,State,Zip:	Not reported
Contact Name:	HEATHER HEATH, MARKETING ASSIS
Contact Address:	Not reported
Contact Address 2:	Not reported
City,State,Zip:	Not reported
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.842134
Longitude:	-121.534349

B10 **1X CHEVRON USA, STATION #0-095142** **HAZNET** **S123717637**
300 THE ALAMEDA **HWTS** **N/A**
< 1/8 **SAN JUAN BAUTISTA, CA 95045**
1 ft.

Site 2 of 8 in cluster B

Relative: Higher
Actual: 207 ft.

HAZNET:

Name:	1X CHEVRON USA, STATION #0-095142
Address:	300 THE ALAMEDA
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact:	HEATHER HEATH
Telephone:	4158429631
Mailing Name:	Not reported
Mailing Address:	P.O. BOX 5004
Year:	1989
Gepaid:	CAC000189648
TSD EPA ID:	CAD980883177
CA Waste Code:	223 - Unspecified oil-containing waste
Disposal Method:	R01 - Recycler
Tons:	0.417

1X CHEVRON USA, STATION #0-095142 (Continued) **S123717637**

HWTS:

Name:	1X CHEVRON USA, STATION #0-095142
Address:	300 THE ALAMEDA
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC000189648
Inactive Date:	10/25/2000
Create Date:	07/03/1989
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	P.O. BOX 5004
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN RAMON, CA 945830804
Owner Name:	CHEVRON USA, INC.
Owner Address:	Not reported
Owner Address 2:	Not reported
Owner City,State,Zip:	Not reported
Contact Name:	HEATHER HEATH
Contact Address:	Not reported
Contact Address 2:	Not reported
City,State,Zip:	Not reported
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.840623
Longitude:	-121.533506

B11 **DIAS CHEVRON SERVICE** **EDR Hist Auto** **1020336755**
300 THE ALAMEDA **N/A**
< 1/8 **SN JUN BATSTA, CA 95045**
1 ft.

Site 3 of 8 in cluster B

Relative:
Higher

Actual:
207 ft.

EDR Hist Auto

Year:	Name:	Type:
1969	DIAS CHEVRON SERVICE	Gasoline Service Stations
1971	DIAS CHEVRON SERVICE	Gasoline Service Stations
1972	DIAS CHEVRON SERVICE	Gasoline Service Stations
1973	DIAS CHEVRON SERVICE	Gasoline Service Stations
1974	DIAS CHEVRON SERVICE	Gasoline Service Stations
1975	DIAS CHEVRON SERVICE	Gasoline Service Stations
1976	DIAS CHEVRON SERVICE	Gasoline Service Stations
1977	DIAS CHEVRON SERVICE	Gasoline Service Stations
1985	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1986	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1987	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1988	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1989	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1990	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1991	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1992	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1993	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1994	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations
1995	DIAS CHEVRON SERVICE STATION	Gasoline Service Stations

B12 **95142** **SWEEPS UST** **U001601670**
300 THE ALAMEDA **HIST UST** **N/A**
< 1/8 **SAN JUAN BAUTISTA, CA 95045**
1 ft.

Site 4 of 8 in cluster B

Relative:
Higher

Actual:
207 ft.

SWEEPS UST:

Name:	95142
Address:	300 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	62714
Number:	9
Board Of Equalization:	44-019637
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	35-000-062714-000001
Tank Status:	A
Capacity:	10000
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	P
Content:	Not reported
Number Of Tanks:	4

Name:	95142
Address:	300 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	62714
Number:	9
Board Of Equalization:	44-019637
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	35-000-062714-000002
Tank Status:	A
Capacity:	10000
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	P
Content:	Not reported
Number Of Tanks:	Not reported

Name:	95142
Address:	300 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	62714
Number:	9
Board Of Equalization:	44-019637
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	3
SWRCB Tank Id:	35-000-062714-000003

95142 (Continued) **U001601670**

Tank Status: A
Capacity: 1000
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

Name: 95142
Address: 300 THE ALAMEDA
City: SAN JUAN BAUTISTA
Status: Active
Comp Number: 62714
Number: 9
Board Of Equalization: 44-019637
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 4
SWRCB Tank Id: 35-000-062714-000004
Tank Status: A
Capacity: 10000
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: P
Content: Not reported
Number Of Tanks: Not reported

HIST UST:
Name: 95142
Address: 300 THE ALAMEDA
City,State,Zip: SAN JUAN BAUTISTA, CA 95045
File Number: 000296bf
URL: https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/000296bf.pdf
Region: STATE
Facility ID: 00000062714
Facility Type: Gas Station
Other Type: Not reported
Contact Name: DIAS, GEORGE J
Telephone: 4086234575
Owner Name: CHEVRON U.S.A. INC.
Owner Address: 575 MARKET
Owner City,St,Zip: SAN FRANCISCO, CA 94105
Total Tanks: 0004

Tank Num: 001
Container Num: 1
Year Installed: Not reported
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: Not reported
Container Construction Thickness: 0000250
Leak Detection: Stock Inventor

Tank Num: 002
Container Num: 2
Year Installed: Not reported

95142 (Continued) **U001601670**

Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	0000250
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	0000250
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	4
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	0000250
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

A13 **SAN JUAN DIAZ PIT** **MINES MRDS** **1025757872**
N/A

< 1/8 **SAN BENITO (County), CA**
1 ft.

Site 9 of 9 in cluster A

Relative:
Lower

Actual:
203 ft.

MINES MRDS:

Name:	SAN JUAN DIAZ PIT
Address:	Not reported
Deposit identification Number:	10285879
City,State,Zip:	CALIFORNIA
URL:	https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10285879
MRDS Identification Number:	Not reported
MAS/MILS Identification Number:	0060690154
Region:	NA
Country:	United States
Primary Commodities:	Sand and Gravel, Construction
Secondary Commodities:	Not reported
Tertiary Commodities:	Not reported
Operation Type:	Surface
Deposit Type:	Not reported
Production Size:	Not reported
Development Status:	Past Producer
Ore Minerals or Materials:	Not reported
Gangue Minerals or Materials:	Not reported
Other Minerals or Materials:	Not reported
Ore Body Form:	Not reported
Workings Type:	Not reported
Mineral Deposit Model:	Not reported
Alteration Processes:	Not reported
Concentration Processes:	Not reported
Previous Names:	Not reported

SAN JUAN DIAZ PIT (Continued) **1025757872**

Ore Controls:	Not reported
Reporter:	Ridenour, James
Host Rock Unit Name:	Not reported
Host Rock Type:	Not reported
Associated Rock Unit Name:	Not reported
Associated Rock Type Code:	Not reported
Structural Characteristics:	Not reported
Tectonic Setting:	Not reported
References:	Not reported
First Production Year:	Not reported
Began Before/After FPY:	Not reported
Last Production Year:	Not reported
Ended Before/After LPY:	Not reported
Year Discovered:	Not reported
Found Before/After YD:	Not reported
Production History:	Not reported
Discovery Information:	Not reported
Latitude:	36.84243
Longitude:	-121.53241

B14	**CHEVRON PRODUCTS CO** **300 THE ALAMEDA**	**HAZNET** **HWTS**	**S123766601** **N/A**
< 1/8 **1 ft.**	**SAN JUAN BAUTISTA, CA 95045**		
	Site 5 of 8 in cluster B		

Relative: **Higher**

Actual: **207 ft.**

HAZNET:

Name:	CHEVRON PRODUCTS CO
Address:	300 THE ALAMEDA
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact:	INACT PER 96 VQ AD
Telephone:	5108425931
Mailing Name:	Not reported
Mailing Address:	PO BOX 5004
Year:	1990
Gepaid:	CAL000041622
TSD EPA ID:	CAD980883177
CA Waste Code:	223 - Unspecified oil-containing waste
Disposal Method:	R01 - Recycler
Tons:	0.1668

HWTS:

Name:	CHEVRON PRODUCTS CO
Address:	300 THE ALAMEDA
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAL000041622
Inactive Date:	06/30/1996
Create Date:	02/15/1991
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX 5004
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN RAMON, CA 945830804

CHEVRON PRODUCTS CO (Continued) **S123766601**

Owner Name:	CHEVRON PRODUCTS CO
Owner Address:	CHEVRON USA INC
Owner Address 2:	Not reported
Owner City,State,Zip:	Not reported
Contact Name:	INACT PER 96 VQ AD
Contact Address:	Not reported
Contact Address 2:	Not reported
City,State,Zip:	Not reported
Facility Status:	Inactive
Facility Type:	PERMANENT
Category:	STATE
Latitude:	36.840621
Longitude:	-121.533505

B15 **CHEVRON SERVICE STATION 9-5142** **RGA LUST** **S114598764**
300 THE ALAMEDA **N/A**
< 1/8 **SAN JUAN BAUTISTA, CA**
1 ft.

Site 6 of 8 in cluster B

Relative:
Higher

Actual:
207 ft.

RGA LUST:

Name:	CHEVRON SERVICE STATION 9-5142
Address:	300 THE ALAMEDA
City:	SAN JUAN BAUTISTA
State:	SAN JUAN BAUTISTA
	1992 CHEVRON SERVICE STATION 9-5142 300 THE ALAMEDA

B16 **CHEVRON SERVICE STATION 9-5142** **LUST** **S102427567**
WSW **300 ALAMEDA ST** **Cortese** **N/A**
< 1/8 **SAN JUAN BAUTISTA, CA 95045** **CERS**
0.006 mi.
33 ft. **Site 7 of 8 in cluster B**

Relative:
Higher

Actual:
208 ft.

LUST:

Name:	CHEVRON SERVICE STATION 9-5142
Address:	300 ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Lead Agency:	CENTRAL COAST RWQCB (REGION 3)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606900026
Global Id:	T0606900026
Latitude:	36.841839
Longitude:	-121.5342523
Status:	Completed - Case Closed
Status Date:	10/24/1991
Case Worker:	RB
RB Case Number:	680
Local Agency:	SAN BENITO COUNTY
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline
EPA Region:	9
Coordinate Source:	Google Map Move
Cuf Case:	NO
Quantity Released Gallons:	Not reported

CHEVRON SERVICE STATION 9-5142 (Continued) **S102427567**

Begin Date:	04/28/1987
Leak Reported Date:	08/07/1987
How Discovered:	Subsurface Monitoring
How Discovered Description:	Not reported
Discharge Source:	Tank
Discharge Cause:	Spill
Stop Method:	Not reported
Stop Description:	Not reported
No Further Action Date:	10/24/1991
CA Water Watershed Name:	Pajaro River - South Santa Clara Valley (305.30)
Dwr Groundwater Subbasin Name:	Gilroy-Hollister Valley - North San Benito (3-003.05)
Disadvantaged Community:	Not reported
CA Enviroscreen 3 Score:	56-60%
CA Enviroscreen 4 Score:	50-55%
Military DOD Site:	No
Facility Project Subtype:	Not reported
RWQCB Region:	CENTRAL COAST RWQCB (REGION 3)
Site History:	Not reported

LUST:

Global Id:	T0606900026
Contact Type:	Regional Board Caseworker - Primary Caseworker
Contact Name:	RB3 STAFF
Organization Name:	CENTRAL COAST RWQCB (REGION 3)
Address:	895 AEROVISTA PL, SUITE 101
City:	SAN LUIS OBISPO
Email:	centralcoast@waterboards.ca.gov
Phone Number:	8055493147
Global Id:	T0606900026
Contact Type:	Local Agency Caseworker
Contact Name:	UST CASE WORKER
Organization Name:	SAN BENITO COUNTY
Address:	1111 SAN FELIPE RD., STE 101
City:	HOLLISTER
Email:	Not reported
Phone Number:	8316364035

LUST:

Global Id:	T0606900026
Action Type:	Other
Date:	08/07/1987
Action:	Leak Reported
Global Id:	T0606900026
Action Type:	Other
Date:	04/28/1987
Action:	Leak Discovery

LUST:

Global Id:	T0606900026
Status:	Open - Case Begin Date
Status Date:	04/28/1987
Global Id:	T0606900026
Status:	Open - Remediation
Status Date:	08/24/1987

CHEVRON SERVICE STATION 9-5142 (Continued) **S102427567**

Global Id:	T0606900026
Status:	Open - Site Assessment
Status Date:	11/23/1987

Global Id:	T0606900026
Status:	Completed - Case Closed
Status Date:	10/24/1991

LUST REG 3:

Region:	3
Regional Board:	Central Coast Region
Facility County:	San Benito
Global ID:	T0606900026
Status:	Case Closed
Case Number:	680
Local Case Num:	Not reported
Case Type:	O
Substance:	Gasoline
Quantity:	Not reported
Abatement Method:	Enhanced Biodegradation - use of any available technology to promote bacterial decomposition of contaminants
Leak Source:	Tank
Leak Cause:	Spill
How Stopped:	Not reported
How Discovered:	Subsurface Monitoring
Release Date:	08/07/1987
Discovered Date:	4/28/87
Enter Date:	09/02/1987
Stop Date:	Not reported
Review Date:	09/08/1990
Enforce Date:	1/1/65
Close Date:	10/24/91
Enforcement Type:	222
Responsible Party:	Not reported
RP Address:	Not reported
Contact:	Not reported
Cross Street:	Not reported
Local Agency:	35000
Lead Agency:	Regional Board
Staff Initials:	JHM
Confirm Leak:	Not reported
Workplan:	Not reported
Prelim Assess:	Not reported
Pollution Char:	11/23/1987
Remedial Plan:	Not reported
Remedial Action:	8/24/87
Monitoring:	/ /
Pilot Program:	UST
Interim Action:	0
Funding:	R
MTBE Class:	*
Max MTBE Grnd Wtr:	Not reported
Max MTBE Soil:	Not reported
Max MTBE Data:	/ /
MTBE Tested:	NT
Lat/Long:	36.8584836 / -121.5447551

CHEVRON SERVICE STATION 9-5142 (Continued) **S102427567**

Soil Qualifier: Not reported
Grnd Wtr Qualifier: Not reported
Mtbe Concentratn: 0
Mtbe Fuel: 1
Org Name: Not reported
Basin Plan: 5.30
Beneficial: Not reported
Priority: 3
UST Cleanup Fund ID: Not reported
Suspended: Not reported
Operator: Not reported
Water System: CSP FREMONT PEAK
Well Name: WELL 01
Distance From Well: 0
Assigned Name: 3510300-001
Summary: 9/4/90 MONITORING WELLS FILLED. AWAITING CLOSURE REPORT.

CORTESE:
Name: CHEVRON SERVICE STATION 9-5142
Address: 300 ALAMEDA ST
City,State,Zip: SAN JUAN BAUTISTA, CA 95045
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0606900026
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED
Status Date: Not reported
Site Code: Not reported
Latitude: Not reported
Longitude: Not reported
Owner: Not reported
Enf Type: Not reported
Swat R: Not reported
Flag: active
Order No: Not reported
Waste Discharge System No: Not reported
Effective Date: Not reported
Region 2: Not reported
WID Id: Not reported
Solid Waste Id No: Not reported
Waste Management Uit Name: Not reported
File Name: Active Open

CERS:
Name: CHEVRON SERVICE STATION 9-5142
Address: 300 ALAMEDA ST
City,State,Zip: SAN JUAN BAUTISTA, CA 95045
Site ID: 223410
CERS ID: T0606900026
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: UST CASE WORKER - SAN BENITO COUNTY
Entity Title: Not reported
Affiliation Address: 1111 SAN FELIPE RD., STE 101
Affiliation City: HOLLISTER

CHEVRON SERVICE STATION 9-5142 (Continued) **S102427567**

Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	8316364035,

Affiliation Type Desc:	Regional Board Caseworker
Entity Name:	RB3 STAFF - CENTRAL COAST RWQCB (REGION 3)
Entity Title:	Not reported
Affiliation Address:	895 AEROVISTA PL, SUITE 101
Affiliation City:	SAN LUIS OBISPO
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	8055493147,

B17
SW
< 1/8
0.015 mi.
81 ft.

BRENDAS CLASSIC CLEANERS
301 THE ALAMEDA
SAN JUAN BAUTISTA, CA 95045

Site 8 of 8 in cluster B

EDR Hist Cleaner **1019942933** **N/A**

Relative: Higher
Actual: 209 ft.

EDR Hist Cleaner

Year:	Name:	Type:
1995	BRENDAS CLASSIC CLEANERS	Drycleaning Plants, Except Rugs
1996	BRENDAS CLASSIC CLEANERS	Drycleaning Plants, Except Rugs

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C18
WNW
< 1/8
0.057 mi.
301 ft.

MASCOVICH PROPERTIES
106 THE ALAMEDA ST
SAN JUAN BAUTISTA, CA 95054

Site 1 of 5 in cluster C

LUST
Cortese
CERS

S102433080 **N/A**

Relative: Higher
Actual: 214 ft.

LUST:

Name:	MASCOVICH PROPERTIES
Address:	106 THE ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95054
Lead Agency:	CENTRAL COAST RWQCB (REGION 3)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606900051
Global Id:	T0606900051
Latitude:	36.843869108163
Longitude:	-121.535172830688
Status:	Completed - Case Closed
Status Date:	01/29/2009
Case Worker:	RB
RB Case Number:	992
Local Agency:	SAN BENITO COUNTY
File Location:	Regional Board
Local Case Number:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline
EPA Region:	9
Coordinate Source:	Google Map Move
Cuf Case:	NO

MASCOVICH PROPERTIES (Continued) **S102433080**

Quantity Released Gallons:	Not reported
Begin Date:	07/23/1987
Leak Reported Date:	07/23/1987
How Discovered:	Other Means
How Discovered Description:	Not reported
Discharge Source:	Tank
Discharge Cause:	Unknown
Stop Method:	Not reported
Stop Description:	Not reported
No Further Action Date:	01/29/2009
CA Water Watershed Name:	Pajaro River - South Santa Clara Valley (305.30)
Dwr Groundwater Subbasin Name:	Gilroy-Hollister Valley - North San Benito (3-003.05)
Disadvantaged Community:	Not reported
CA Enviroscreen 3 Score:	51-55%
CA Enviroscreen 4 Score:	50-55%
Military DOD Site:	No
Facility Project Subtype:	Not reported
RWQCB Region:	CENTRAL COAST RWQCB (REGION 3)
Site History:	RB closed the UST case on 1/29/09. Based on the soil investigation, groundwater monitoring, and cleanup results, Central Coast Water Board staff believes there is no significant threat to groundwater resources, human health or the environment from this site. Petroleum hydrocarbon concentration trends are downward, and remaining residual soil and groundwater contamination are well characterized and contracting or declining in size and concentration. The contaminant mass has been removed from the site to the maximum extent practicable, and historical monitoring data indicate contaminant concentrations in groundwater will likely decrease to below cleanup goals in a reasonable time. The San Benito County Health and Human Services Agency (SBCHHSA) agrees with our proposed closure of the case. Residual soil and groundwater contamination still underlies the site that could pose an unacceptable risk under certain site redevelopment activities such as site grading, excavation, or de-watering. The Central Coast Water Board, SBCHHSA and the appropriate local planning and building departments must be notified prior to any changes in land use, grading activities, excavation, or dewatering. This notification should include a statement that residual soil and groundwater contamination underlie the property and may underlie nearby properties, and a description of the mitigation actions necessary (if any) to ensure that any possibly contaminated soil or groundwater brought to the surface by these activities are managed appropriately. Future site disturbance could require worker health and safety protection, and restrictions on the disposal of soil and groundwater. The levels of residual contamination and any associated risks are expected to diminish with time. The SBCHHSA may require additional site assessment if the property is proposed to be redeveloped. Additional actions required by SBCHHSA may include, but not limited to, a case review, further remedial action, soil gas analysis, and a human health risk assessment.

LUST:

Global Id:	T0606900051
Contact Type:	Regional Board Caseworker - Primary Caseworker
Contact Name:	RB3 STAFF
Organization Name:	CENTRAL COAST RWQCB (REGION 3)
Address:	895 AEROVISTA PL, SUITE 101
City:	SAN LUIS OBISPO
Email:	centralcoast@waterboards.ca.gov

MASCOVICH PROPERTIES (Continued) **S102433080**

Phone Number:	8055493147
Global Id:	T0606900051
Contact Type:	Local Agency Caseworker
Contact Name:	UST CASE WORKER
Organization Name:	SAN BENITO COUNTY
Address:	1111 SAN FELIPE RD., STE 101
City:	HOLLISTER
Email:	Not reported
Phone Number:	8316364035

LUST:

Global Id:	T0606900051
Action Type:	ENFORCEMENT
Date:	11/09/1990
Action:	* Historical Enforcement
Global Id:	T0606900051
Action Type:	ENFORCEMENT
Date:	01/29/2009
Action:	Closure/No Further Action Letter
Global Id:	T0606900051
Action Type:	Other
Date:	07/23/1987
Action:	Leak Reported

LUST:

Global Id:	T0606900051
Status:	Open - Case Begin Date
Status Date:	07/23/1987
Global Id:	T0606900051
Status:	Open - Verification Monitoring
Status Date:	11/09/1990
Global Id:	T0606900051
Status:	Completed - Case Closed
Status Date:	01/29/2009

LUST REG 3:

Region:	3
Regional Board:	Central Coast Region
Facility County:	San Benito
Global ID:	T0606900051
Status:	Post remedial action monitoring
Case Number:	992
Local Case Num:	Not reported
Case Type:	O
Substance:	Gasoline
Quantity:	Not reported
Abatement Method:	U
Leak Source:	Tank
Leak Cause:	UNK
How Stopped:	Not reported

MASCOVICH PROPERTIES (Continued) **S102433080**

How Discovered:	OM
Release Date:	07/23/1987
Discovered Date:	Not reported
Enter Date:	12/01/1990
Stop Date:	Not reported
Review Date:	12/09/1992
Enforce Date:	11/9/90
Close Date:	Not reported
Enforcement Type:	EF
Responsible Party:	SANDY MUSKOVICH
RP Address:	7090 CHURCH ST
Contact:	Not reported
Cross Street:	Not reported
Local Agency:	35000
Lead Agency:	Local Agency
Staff Initials:	JHM
Confirm Leak:	Not reported
Workplan:	Not reported
Prelim Assess:	Not reported
Pollution Char:	/ /
Remedial Plan:	Not reported
Remedial Action:	Not reported
Monitoring:	11/09/1990
Pilot Program:	UST
Interim Action:	0
Funding:	R
MTBE Class:	*
Max MTBE Grnd Wtr:	Not reported
Max MTBE Soil:	Not reported
Max MTBE Data:	/ /
MTBE Tested:	NT
Lat/Long:	37.3901115 / -121.9595166
Soil Qualifier:	Not reported
Grnd Wtr Qualifier:	Not reported
Mtbe Concentratn:	0
Mtbe Fuel:	1
Org Name:	Not reported
Basin Plan:	5.30
Beneficial:	Not reported
Priority:	3A3
UST Cleanup Fund ID:	Not reported
Suspended:	Not reported
Operator:	Not reported
Water System:	PLANT OPERATIONS
Well Name:	WELL 02 - INACTIVE
Distance From Well:	0
Assigned Name:	06S/01W-22J02 M
Summary:	MONITORING CONTINUES UNTIL CONTAMINANT LEVELS ARE BELOW EPA STANDARDS.

CORTESE:

Name:	MASCOVICH PROPERTIES
Address:	106 THE ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95054
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0606900051
Site/Facility Type:	LUST CLEANUP SITE

MASCOVICH PROPERTIES (Continued) **S102433080**

Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

CERS:

Name:	MASCOVICH PROPERTIES
Address:	106 THE ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95054
Site ID:	225220
CERS ID:	T0606900051
CERS Description:	Leaking Underground Storage Tank Cleanup Site

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	UST CASE WORKER - SAN BENITO COUNTY
Entity Title:	Not reported
Affiliation Address:	1111 SAN FELIPE RD., STE 101
Affiliation City:	HOLLISTER
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	8316364035,

Affiliation Type Desc:	Regional Board Caseworker
Entity Name:	RB3 STAFF - CENTRAL COAST RWQCB (REGION 3)
Entity Title:	Not reported
Affiliation Address:	895 AEROVISTA PL, SUITE 101
Affiliation City:	SAN LUIS OBISPO
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	8055493147,

19	**MARLENE DWYER**	**RCRA NonGen / NLR**	**1026714718**
West	**87 4TH STREET**		**CAC003103097**
< 1/8	**SAN JUAN BAUTISTA, CA 95045**		
0.061 mi.			
321 ft.			

Relative: Higher

Actual: 209 ft.

RCRA Listings:

Date Form Received by Agency:	20210128
Handler Name:	Marlene Dwyer
Handler Address:	87 4TH STREET
Handler City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC003103097
Contact Name:	MARLENE DWYER
Contact Address:	87 4TH STREET
Contact City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact Telephone:	408-427-7131
Contact Fax:	Not reported
Contact Email:	DANMARDWYER@GMAIL.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	87 4TH STREET
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner Name:	Marlene Dwyer
Owner Type:	Other
Operator Name:	Marlene Dwyer
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No

MARLENE DWYER (Continued) **1026714718**

Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20210226
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: MARLENE DWYER	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	87 4TH STREET
Owner/Operator City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner/Operator Telephone:	408-427-7131
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: MARLENE DWYER	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	87 4TH STREET
Owner/Operator City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner/Operator Telephone:	408-427-7131
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20210128
Handler Name: MARLENE DWYER	
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	No
Electronic Manifest Broker:	No

MARLENE DWYER (Continued) **1026714718**

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

C20
WNW
< 1/8
0.091 mi.
479 ft.

MASCOVICH PROPERTIES
102 THE ALAMEDA
SAN JUAN BATISTA, CA

HIST CORTESE **S105026325**
N/A

Site 2 of 5 in cluster C

Relative:
Higher
Actual:
219 ft.

HIST CORTESE:

edr_fname:	MASCOVICH PROPERTIES
edr_fadd1:	102 THE ALAMEDA
City,State,Zip:	SAN JUAN BATISTA, CA
Region:	CORTESE
Facility County Code:	35
Reg By:	LTNKA
Reg Id:	992

C21
WNW
< 1/8
0.095 mi.
500 ft.

J & K UNION SERVICE
101 THE ALAMEDA
SAN JUAN BAUTISTA, CA 95045

LUST
SWEEPS UST
HIST UST

U001601682
N/A

Site 3 of 5 in cluster C

Relative:
Higher
Actual:
216 ft.

LUST:

Name:	B & K UNION TOW SERVICE
Address:	101 THE ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Lead Agency:	CENTRAL COAST RWQCB (REGION 3)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606900024
Global Id:	T0606900024
Latitude:	36.843353
Longitude:	-121.535363
Status:	Completed - Case Closed
Status Date:	01/21/2015
Case Worker:	Not reported
RB Case Number:	679
Local Agency:	SAN BENITO COUNTY
File Location:	Regional Board
Local Case Number:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Waste Oil / Motor / Hydraulic / Lubricating
EPA Region:	9
Coordinate Source:	Google Geocode
Cuf Case:	YES
Quantity Released Gallons:	Not reported

J & K UNION SERVICE (Continued) **U001601682**

Begin Date:	04/30/1987
Leak Reported Date:	04/30/1987
How Discovered:	Other Means
How Discovered Description:	Not reported
Discharge Source:	Tank
Discharge Cause:	Corrosion
Stop Method:	Not reported
Stop Description:	Not reported
No Further Action Date:	01/21/2015
CA Water Watershed Name:	Pajaro River - South Santa Clara Valley (305.30)
Dwr Groundwater Subbasin Name:	Gilroy-Hollister Valley - North San Benito (3-003.05)
Disadvantaged Community:	Not reported
CA Enviroscreen 3 Score:	56-60%
CA Enviroscreen 4 Score:	50-55%
Military DOD Site:	No
Facility Project Subtype:	Not reported
RWQCB Region:	CENTRAL COAST RWQCB (REGION 3)
Site History:	The Site had six underground storage tanks (USTs) which were removed in the 1980s and multiple fuel release points were observed. Although gasoline-impacted soils were observed at a depth of 17 feet (four feet above groundwater level at the time), physical constraints limited the amount of contaminated soil that could be removed. The following investigations and wells have been completed at the Site: In 1988, Waterworks installed monitoring wells L-1 through L-4 at the Site. In 1994, Terratech Inc. installed monitoring wells MW-1 through MW-3 at the Site. In January 1995, monitoring wells MW-4 through MW-6 were installed at the Site. TPH and BTEX were detected in the soil and groundwater samples from MW-5, but not from MW-4 and MW-6 (Terratech 1995). In 1997, monitoring wells MW-7 through MW-9 were installed at the Site to replace wells L-1 and L-2 which were destroyed due to their long screens (over 20 feet). In addition, upgradient well L-4 was destroyed. Downgradient well MW-4 was approved for well destruction by the RWQCB, but has not been destroyed yet. The following remedial activities have been conducted at the Site: UST removal and limited soil excavation because of physical constraints 1980s (D&M, 2008). .Oxygen Release Compound (ORCTM) application 1997 and 1998 (D&M, 2008). iSOCTM installation and operation - June 2005 through summer 2009 .

LUST:

Global Id:	T0606900024
Contact Type:	Local Agency Caseworker
Contact Name:	UST CASE WORKER
Organization Name:	SAN BENITO COUNTY
Address:	1111 SAN FELIPE RD., STE 101
City:	HOLLISTER
Email:	Not reported
Phone Number:	8316364035

LUST:

Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	08/13/2007
Action:	Verbal Communication
Global Id:	T0606900024
Action Type:	ENFORCEMENT

J & K UNION SERVICE (Continued) **U001601682**

Date:	04/25/2011
Action:	13267 Requirement
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	10/03/2008
Action:	Clean Up Fund - Case Closure Review Summary Report (RSR)
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	06/15/2010
Action:	Clean Up Fund - Case Closure Review Summary Report (RSR)
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	06/29/2010
Action:	Clean Up Fund - Case Closure Review Summary Report (RSR)
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	06/06/2012
Action:	Clean Up Fund - Case Closure Review Summary Report (RSR)
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	06/30/2011
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	12/30/2011
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	02/18/1998
Action:	Staff Letter
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	01/21/2015
Action:	Closure/No Further Action Letter
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	12/30/2013
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	12/18/2008
Action:	File review
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	10/19/2007
Action:	File review

J & K UNION SERVICE (Continued) **U001601682**

Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	07/18/2008
Action:	Staff Letter
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	07/18/2008
Action:	Staff Letter
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	12/13/2006
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	01/28/2010
Action:	13267 Monitoring Program
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	08/18/2011
Action:	13267 Requirement
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	07/17/2014
Action:	Notification - Fee Title Owners Notice
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	09/13/2007
Action:	Other Report / Document
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/30/2005
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/20/2008
Action:	Other Report / Document
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	02/17/2005
Action:	Interim Remedial Action Plan
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/30/2006
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE

J & K UNION SERVICE (Continued) **U001601682**

Date: 02/01/2007
Action: Unknown

Global Id: T0606900024
Action Type: RESPONSE
Date: 10/30/2006
Action: Monitoring Report - Quarterly

Global Id: T0606900024
Action Type: RESPONSE
Date: 10/20/2007
Action: Monitoring Report - Quarterly

Global Id: T0606900024
Action Type: RESPONSE
Date: 10/20/2008
Action: Monitoring Report - Semi-Annually

Global Id: T0606900024
Action Type: RESPONSE
Date: 12/20/2008
Action: Monitoring Report - Semi-Annually

Global Id: T0606900024
Action Type: RESPONSE
Date: 06/04/2007
Action: Other Report / Document

Global Id: T0606900024
Action Type: RESPONSE
Date: 04/20/2008
Action: Monitoring Report - Quarterly

Global Id: T0606900024
Action Type: RESPONSE
Date: 04/20/2007
Action: Monitoring Report - Quarterly

Global Id: T0606900024
Action Type: RESPONSE
Date: 07/20/2005
Action: Other Report / Document

Global Id: T0606900024
Action Type: RESPONSE
Date: 12/30/2012
Action: Monitoring Report - Semi-Annually

Global Id: T0606900024
Action Type: RESPONSE
Date: 06/30/2013
Action: Monitoring Report - Semi-Annually

Global Id: T0606900024
Action Type: RESPONSE
Date: 03/28/2014
Action: Request for Closure - Regulator Responded

J & K UNION SERVICE (Continued) **U001601682**

Global Id:	T0606900024
Action Type:	RESPONSE
Date:	11/15/2013
Action:	Other Workplan - Regulator Responded
Global Id:	T0606900024
Action Type:	REMEDIATION
Date:	06/01/2005
Action:	In Situ Physical/Chemical Treatment (other than SVE)
Global Id:	T0606900024
Action Type:	REMEDIATION
Date:	12/05/2011
Action:	In Situ Biological Treatment
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	02/21/2007
Action:	13267 Requirement
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	02/11/2008
Action:	Site Visit / Inspection / Sampling
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	12/19/2008
Action:	File review
Global Id:	T0606900024
Action Type:	Other
Date:	04/30/1987
Action:	Leak Reported
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/20/2008
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	12/05/2008
Action:	Other Report / Document
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/29/1989
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/18/1988
Action:	CAP/RAP - Feasibility Study Report
Global Id:	T0606900024
Action Type:	RESPONSE

J & K UNION SERVICE (Continued) **U001601682**

Date:	04/27/1987
Action:	Soil and Water Investigation Report
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	09/15/1987
Action:	Soil and Water Investigation Report
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	02/09/1988
Action:	Preliminary Site Assessment Report
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	03/20/2009
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	06/30/2010
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/26/1989
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	07/26/1990
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	01/12/1989
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	07/25/1989
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	01/14/1991
Action:	Correspondence
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	05/05/2010
Action:	Conceptual Site Model
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	02/21/1988
Action:	Soil and Water Investigation Report

J & K UNION SERVICE (Continued) **U001601682**

Global Id:	T0606900024
Action Type:	RESPONSE
Date:	01/15/1990
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/21/1988
Action:	Remedial Progress Report
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/29/1990
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/16/1990
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	12/20/2009
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/04/1988
Action:	Soil and Water Investigation Report
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/30/2002
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/20/2003
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/20/2004
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	04/20/2003
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	10/20/2004
Action:	Monitoring Report - Quarterly
Global Id:	T0606900024
Action Type:	RESPONSE

J & K UNION SERVICE (Continued) **U001601682**

Date:	12/30/2010
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	06/30/2012
Action:	Monitoring Report - Semi-Annually
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	02/28/2011
Action:	Soil and Water Investigation Report - Regulator Responded
Global Id:	T0606900024
Action Type:	RESPONSE
Date:	06/30/2011
Action:	Corrective Action Plan / Remedial Action Plan - Regulator Responded
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	02/17/2005
Action:	* No Action
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	04/07/2005
Action:	Staff Letter
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	10/05/2007
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	01/30/2008
Action:	Site Visit / Inspection / Sampling
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	11/13/2008
Action:	13267 Requirement
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	11/14/2008
Action:	13267 Monitoring Program
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	08/09/2011
Action:	Notice of Termination
Global Id:	T0606900024
Action Type:	ENFORCEMENT
Date:	07/07/2010
Action:	13267 Requirement

J & K UNION SERVICE (Continued) **U001601682**

LUST:

Global Id:	T0606900024
Status:	Open - Case Begin Date
Status Date:	04/30/1987
Global Id:	T0606900024
Status:	Open - Site Assessment
Status Date:	07/23/1987
Global Id:	T0606900024
Status:	Open - Remediation
Status Date:	08/15/1990
Global Id:	T0606900024
Status:	Open - Verification Monitoring
Status Date:	04/16/1994
Global Id:	T0606900024
Status:	Open - Remediation
Status Date:	07/01/2005
Global Id:	T0606900024
Status:	Open - Assessment & Interim Remedial Action
Status Date:	12/05/2011
Global Id:	T0606900024
Status:	Open - Remediation
Status Date:	12/06/2011
Global Id:	T0606900024
Status:	Open - Eligible for Closure
Status Date:	05/15/2014
Global Id:	T0606900024
Status:	Completed - Case Closed
Status Date:	01/21/2015

SWEEPS UST:

Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	66509
Number:	9
Board Of Equalization:	44-019638
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	35-000-066509-000001
Tank Status:	A
Capacity:	10000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P

J & K UNION SERVICE (Continued) **U001601682**

Content:	REG UNLEADED
Number Of Tanks:	6
Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	66509
Number:	9
Board Of Equalization:	44-019638
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	35-000-066509-000002
Tank Status:	A
Capacity:	8000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported
Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	66509
Number:	9
Board Of Equalization:	44-019638
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	3
SWRCB Tank Id:	35-000-066509-000003
Tank Status:	A
Capacity:	1000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	UNKNOWN
Number Of Tanks:	Not reported
Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	66509
Number:	9
Board Of Equalization:	44-019638
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	4
SWRCB Tank Id:	35-000-066509-000004
Tank Status:	A
Capacity:	1000

J & K UNION SERVICE (Continued) **U001601682**

Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	UNKNOWN
Number Of Tanks:	Not reported

Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	66509
Number:	9
Board Of Equalization:	44-019638
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	5
SWRCB Tank Id:	35-000-066509-000005
Tank Status:	A
Capacity:	Not reported
Active Date:	07-01-85
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	66509
Number:	9
Board Of Equalization:	44-019638
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	6
SWRCB Tank Id:	35-000-066509-000006
Tank Status:	A
Capacity:	Not reported
Active Date:	07-01-85
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

HIST UST:

Name:	J & K UNION SERVICE
Address:	101 THE ALAMEDA
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
File Number:	Not reported
URL:	Not reported
Region:	STATE
Facility ID:	00000066509
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	JEFF BOYCE

J & K UNION SERVICE (Continued) **U001601682**

Telephone:	4086232459
Owner Name:	KENNETH J. LAVERONE
Owner Address:	101 THE ALAMEDA
Owner City,St,Zip:	SAN JUAN BAUTISTA, CA 95045
Total Tanks:	0006
Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	WASTE
Type of Fuel:	1
Container Construction Thickness:	X
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	06
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	004
Container Num:	4
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	06
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	005
Container Num:	5
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	006
Container Num:	6
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL

J & K UNION SERVICE (Continued) **U001601682**

Container Construction Thickness:	Not reported
Leak Detection:	None

C22 **B & K UNION TOW SERVICE** **HIST UST** **S105026324**
WNW **101 THE ALAMEDA** **HIST CORTESE** **N/A**
< 1/8 **SAN JUAN BATISTA, CA 95045**
0.095 mi.
500 ft. **Site 4 of 5 in cluster C**

Relative:
Higher

Actual:
216 ft.

HIST UST:

Name:	J AND K UNION SERVICE
Address:	101 THE ALAMEDA
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
File Number:	00029761
URL:	https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/00029761.pdf
Region:	Not reported
Facility ID:	Not reported
Facility Type:	Not reported
Other Type:	Not reported
Contact Name:	Not reported
Telephone:	Not reported
Owner Name:	Not reported
Owner Address:	Not reported
Owner City,St,Zip:	Not reported
Total Tanks:	Not reported

Tank Num:	Not reported
Container Num:	Not reported
Year Installed:	Not reported
Tank Capacity:	Not reported
Tank Used for:	Not reported
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Not reported

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HIST CORTESE:

edr_fname:	B & K UNION TOW SERVICE
edr_fadd1:	101 THE ALAMEDA
City,State,Zip:	SAN JUAN BATISTA, CA 95045
Region:	CORTESE
Facility County Code:	35
Reg By:	LTNKA
Reg Id:	679

C23 **WNW** **< 1/8** **0.095 mi.** **500 ft.**	**B & K UNION TOW SERVICE** **101 THE ALAMEDA ST** **SAN JUAN BAUTISTA, CA 95045** **Site 5 of 5 in cluster C**	**LUST** **Cortese** **CERS**	**S101301052** **N/A**

Relative:
Higher

Actual:
216 ft.

LUST REG 3:

Region:	3
Regional Board:	Central Coast Region
Facility County:	San Benito
Global ID:	T0606900024
Status:	Post remedial action monitoring
Case Number:	679
Local Case Num:	Not reported
Case Type:	O
Substance:	Waste Oil
Quantity:	Not reported
Abatement Method:	U
Leak Source:	Tank
Leak Cause:	Corrosion
How Stopped:	Not reported
How Discovered:	OM
Release Date:	04/30/1987
Discovered Date:	Not reported
Enter Date:	09/02/1987
Stop Date:	Not reported
Review Date:	10/22/2002
Enforce Date:	1/1/65
Close Date:	Not reported
Enforcement Type:	LET
Responsible Party:	KEN LAVERONE OR BONNIE
RP Address:	P.O. BOX 1146
Contact:	Not reported
Cross Street:	THE ALAMEDA +FRANKLIN
Local Agency:	35000
Lead Agency:	Regional Board
Staff Initials:	BUC
Confirm Leak:	Not reported
Workplan:	Not reported
Prelim Assess:	Not reported
Pollution Char:	07/23/1987
Remedial Plan:	Not reported
Remedial Action:	8/15/90
Monitoring:	04/16/1994
Pilot Program:	UST
Interim Action:	0
Funding:	R
MTBE Class:	C
Max MTBE Grnd Wtr:	5
Max MTBE Soil:	Not reported
Max MTBE Data:	09/25/2002
MTBE Tested:	YES
Lat/Long:	36.8584836 / -121.5447551
Soil Qualifier:	Not reported
Grnd Wtr Qualifier:	<
Mtbe Concentratn:	6
Mtbe Fuel:	0
Org Name:	Not reported
Basin Plan:	5.30

B & K UNION TOW SERVICE (Continued) **S101301052**

Beneficial: MUN
Priority: 1C1
UST Cleanup Fund ID: Not reported
Suspended: Not reported
Operator: Not reported
Water System: CSP FREMONT PEAK
Well Name: WELL 01
Distance From Well: 0
Assigned Name: 3510300-001
Summary: FEBRUARY 1997 - TWENTY FIVE ORC COLUMNS INSTALLED OCTOBER 1998 - TWENTY THREE ADDITIONAL ORC COLUMNS INSTALLED

CORTESE:

Name:	B & K UNION TOW SERVICE
Address:	101 THE ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0606900024
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

CERS:

Name:	B & K UNION TOW SERVICE
Address:	101 THE ALAMEDA ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Site ID:	259217
CERS ID:	T0606900024
CERS Description:	Leaking Underground Storage Tank Cleanup Site

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	UST CASE WORKER - SAN BENITO COUNTY
Entity Title:	Not reported
Affiliation Address:	1111 SAN FELIPE RD., STE 101
Affiliation City:	HOLLISTER
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	8316364035,

D24 **B & K UNION SERVICE** **EDR Hist Auto** **1021137272**
WNW **101 3RD ST** **N/A**
< 1/8 **SAN JUAN BAUTISTA, CA 95045**
0.113 mi.
598 ft. **Site 1 of 7 in cluster D**

Relative: Higher
Actual: 217 ft.

EDR Hist Auto

Year:	Name:	Type:
1969	B & K UNION SERVICE	Gasoline Service Stations
1971	B & K UNION SERVICE	Gasoline Service Stations
1972	B & K UNION SERVICE	Gasoline Service Stations
1973	B & K UNION SERVICE	Gasoline Service Stations
1974	B & K UNION SERVICE	Gasoline Service Stations
1975	B & K UNION SERVICE	Gasoline Service Stations
1987	B & K UNION SERVICE	Auto And Home Supply Stores
1988	B & K UNION SERVICE	Gasoline Service Stations
1989	JEFF & KAY AUTOMOTIVE	Gasoline Service Stations
1989	B & K UNION SERVICE	Gasoline Service Stations, NEC
1990	B & K UNION SERVICE	Gasoline Service Stations, NEC
1991	B & K UNION SERVICE	Gasoline Service Stations, NEC
1992	B & K UNION SERVICE	Gasoline Service Stations, NEC
1993	B & K UNION SERVICE	Gasoline Service Stations, NEC

D25 **JANDK AUTO REPAIR** **SWEEPS UST** **U001601683**
WNW **101 3RD ST** **HIST UST** **N/A**
< 1/8 **SAN JUAN BAUTISTA, CA 95045**
0.113 mi.
598 ft. **Site 2 of 7 in cluster D**

Relative: Higher
Actual: 217 ft.

SWEEPS UST:

Name:	J&K AUTO REPAIR
Address:	101 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	57668
Number:	9
Board Of Equalization:	44-019636
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	35-000-057668-000001
Tank Status:	A
Capacity:	550
Active Date:	07-01-85
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	6

Name:	J&K AUTO REPAIR
Address:	101 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	57668
Number:	9
Board Of Equalization:	44-019636
Referral Date:	07-01-85
Action Date:	Not reported

JANDK AUTO REPAIR (Continued) **U001601683**

Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	35-000-057668-000002
Tank Status:	A
Capacity:	250
Active Date:	07-01-85
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

Name:	J&K AUTO REPAIR
Address:	101 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	57668
Number:	9
Board Of Equalization:	44-019636
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	3
SWRCB Tank Id:	35-000-057668-000003
Tank Status:	A
Capacity:	10000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

Name:	J&K AUTO REPAIR
Address:	101 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	57668
Number:	9
Board Of Equalization:	44-019636
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	4
SWRCB Tank Id:	35-000-057668-000004
Tank Status:	A
Capacity:	8000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

Name:	J&K AUTO REPAIR
Address:	101 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	57668
Number:	9

JANDK AUTO REPAIR (Continued) **U001601683**

Board Of Equalization:	44-019636
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	5
SWRCB Tank Id:	35-000-057668-000005
Tank Status:	A
Capacity:	1000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

Name:	J&K AUTO REPAIR
Address:	101 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	57668
Number:	9
Board Of Equalization:	44-019636
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	6
SWRCB Tank Id:	35-000-057668-000006
Tank Status:	A
Capacity:	1000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

HIST UST:

Name:	JANDK AUTO REPAIR
Address:	101 3RD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
File Number:	00029743
URL:	https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/00029743.pdf
Region:	STATE
Facility ID:	00000057668
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	Not reported
Telephone:	4086232459
Owner Name:	J&K AUTO REPAIR
Owner Address:	101 3RD ST.
Owner City,St,Zip:	SAN JUAN BAUTISTA, CA 95045
Total Tanks:	0006

Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00000550
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL

JANDK AUTO REPAIR (Continued) **U001601683**

Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00000250
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	1973
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	004
Container Num:	4
Year Installed:	1973
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	005
Container Num:	5
Year Installed:	1969
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	006
Container Num:	6
Year Installed:	1969
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	None

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E26 **CLAUDES BACKHOE SERVICE** **HIST UST** **U001601676**
WSW **113 FIFTH ST.** **N/A**
1/8-1/4 **SAN JUAN BAUTISTA, CA 95045**
0.127 mi.
671 ft. **Site 1 of 2 in cluster E**

Relative:
Higher
Actual:
213 ft.

HIST UST:

Name:	CLAUDES BACKHOE SERVICE
Address:	113 FIFTH ST.
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
File Number:	Not reported
URL:	Not reported
Region:	STATE
Facility ID:	00000046599
Facility Type:	Other
Other Type:	CONSTRUCTION YARD
Contact Name:	Not reported
Telephone:	4086232511
Owner Name:	JOSEPH W. CULLUMBER
Owner Address:	111 FIFTH ST.
Owner City,St,Zip:	SAN JUAN BAUTISTA, CA 95045
Total Tanks:	0002

Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00000400
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Visual

Tank Num:	002
Container Num:	2
Year Installed:	1979
Tank Capacity:	00000400
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Visual

E27 **CLAUDES BACKHOE SERVICE** **SWEEPS UST** **S106924697**
WSW **113 5TH ST** **N/A**
1/8-1/4 **SAN JUAN BAUTISTA, CA 95045**
0.127 mi.
671 ft. **Site 2 of 2 in cluster E**

Relative:
Higher
Actual:
213 ft.

SWEEPS UST:

Name:	CLAUDES BACKHOE SERVICE
Address:	113 5TH ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	46599
Number:	9
Board Of Equalization:	Not reported
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	35-000-046599-000001

CLAUDES BACKHOE SERVICE (Continued) **S106924697**

Tank Status: A
Capacity: 400
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: LEADED
Number Of Tanks: 2

Name: CLAUDES BACKHOE SERVICE
Address: 113 5TH ST
City: SAN JUAN BAUTISTA
Status: Active
Comp Number: 46599
Number: 9
Board Of Equalization: Not reported
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 2
SWRCB Tank Id: 35-000-046599-000002
Tank Status: A
Capacity: 400
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: DIESEL
Number Of Tanks: Not reported

F28
NNW
1/8-1/4
0.137 mi.
724 ft.

SAN JUAN BAUTISTA STATE HISTORICAL PARK
19 FRANKLIN ST
SAN JUAN BAUTISTA, CA 95045

CUPA Listings
HAZNET
HWTS

S112901636
N/A

Site 1 of 3 in cluster F

Relative: Higher

Actual: 227 ft.

CUPA SAN BENITO:
Name: SAN JUAN BAUTISTA STATE HISTORIC PARK
Address: 19 FRANKLIN ST
City,State,Zip: SAN JUAN BAUTISTA, CA
Facility ID: FA0000441
Record ID: PR0001581
Program/Element Code: 4206
Program/Element: 4206 - HAZMAT BUSINESS PLAN GENERAL
Billing Status: 01 - ACTIVE, BILLABLE
Surcharge Program/Element: (none)
CERS ID: 10837879
Latitude: Not reported
Longitude: Not reported

Name: SAN JUAN BAUTISTA STATE HISTORIC PARK
Address: 19 FRANKLIN ST
City,State,Zip: SAN JUAN BAUTISTA, CA
Facility ID: FA0000441
Record ID: PR0001586
Program/Element Code: 7000
Program/Element: 7000 - HAZMAT BUSINESS PLAN RANGE 1 BILLING
Billing Status: 01 - ACTIVE, BILLABLE
Surcharge Program/Element: (none)
CERS ID: 10837879

SAN JUAN BAUTISTA STATE HISTORICAL PARK (Continued) **S112901636**

Latitude:	36.84452
Longitude:	-121.53476

HAZNET:

Name:	SAN JUAN BAUTISTA STATE HISTORICAL PARK
Address:	19 FRANKLIN ST
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact:	ROBERT MCMANAMAN
Telephone:	8316234526
Mailing Name:	Not reported
Mailing Address:	19 FRANKLIN ST
Year:	2003
Gepaid:	CAC002182761
TSD EPA ID:	CAD028409019
CA Waste Code:	141 - Off-specification, aged or surplus inorganics
Disposal Method:	H01 - Transfer Station
Tons:	0.0125
Year:	2003
Gepaid:	CAC002182761
TSD EPA ID:	CAD028409019
CA Waste Code:	331 - Off-specification, aged or surplus organics
Disposal Method:	H01 - Transfer Station
Tons:	0.055
Year:	2003
Gepaid:	CAC002182761
TSD EPA ID:	CAD008252405
CA Waste Code:	214 - Unspecified solvent mixture
Disposal Method:	R01 - Recycler
Tons:	0.36
Year:	2003
Gepaid:	CAC002182761
TSD EPA ID:	CAT080013352
CA Waste Code:	331 - Off-specification, aged or surplus organics
Disposal Method:	R01 - Recycler
Tons:	0.1815
Year:	2003
Gepaid:	CAC002182761
TSD EPA ID:	CAT000646117
CA Waste Code:	352 - Other organic solids
Disposal Method:	D80 - Disposal, Land Fill
Tons:	0.3

Additional Info:

Year:	2003
Gen EPA ID:	CAC002182761
Shipment Date:	20030604
Creation Date:	7/22/2004 7:51:02
Receipt Date:	20030618

SAN JUAN BAUTISTA STATE HISTORICAL PARK (Continued) **S112901636**

Manifest ID:	22410473
Trans EPA ID:	CAR000003707
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT000546119
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT000646117
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	0.3
Waste Quantity:	600
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20030604
Creation Date:	7/22/2004 7:52:06
Receipt Date:	20030616
Manifest ID:	22410477
Trans EPA ID:	CAR000003707
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD008252405
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD008252405
TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	0.36
Waste Quantity:	100
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20030604
Creation Date:	7/22/2004 7:52:06
Receipt Date:	20030617
Manifest ID:	22410479
Trans EPA ID:	CAR000003707
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported

SAN JUAN BAUTISTA STATE HISTORICAL PARK (Continued) **S112901636**

Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	D002
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.0125
Waste Quantity:	25
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20030604
Creation Date:	7/22/2004 7:52:06
Receipt Date:	20030617
Manifest ID:	22410479
Trans EPA ID:	CAR000003707
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	D001
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.005
Waste Quantity:	10
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20030604
Creation Date:	7/22/2004 7:52:06
Receipt Date:	20030617
Manifest ID:	22410479
Trans EPA ID:	CAR000003707
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.05
Waste Quantity:	100
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported

SAN JUAN BAUTISTA STATE HISTORICAL PARK (Continued) **S112901636**

Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20030604
Creation Date:	7/22/2004 8:36:14
Receipt Date:	20030617
Manifest ID:	22410478
Trans EPA ID:	CAR000003707
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080013352
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080013352
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	0.1815
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

HWTS:

Name:	SAN JUAN BAUTISTA STATE HISTORICAL PARK
Address:	19 FRANKLIN ST
Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC002182761
Inactive Date:	12/01/2003
Create Date:	06/03/2003
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	19 FRANKLIN ST
Mailing Address 2:	Not reported
Mailing City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Owner Name:	CITY OF SAN JUAN BAUTISTA
Owner Address:	19 FRANKLIN ST
Owner Address 2:	Not reported
Owner City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Contact Name:	ROBERT MCMANAMAN
Contact Address:	19 FRANKLIN ST
Contact Address 2:	Not reported
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	36.845055
Longitude:	-121.534159

F29 **NNW** **1/8-1/4** **0.137 mi.** **724 ft.**	**JESSICA DUNAJSKI** **19 FRANKLIN ST.** **SAN JUAN BAUTISTA, CA 95045** **Site 2 of 3 in cluster F**	**RCRA NonGen / NLR**	**1027080591** **CAC003152597**

Relative: **Higher**

Actual: **227 ft.**

RCRA Listings:

Date Form Received by Agency:	20211214
Handler Name:	Jessica Dunajski
Handler Address:	19 FRANKLIN ST.
Handler City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC003152597
Contact Name:	JESSICA DUNAJSKI
Contact Address:	15751 TESLA RD.
Contact City,State,Zip:	LIVERMORE, CA 94550
Contact Telephone:	925-447-4630
Contact Fax:	Not reported
Contact Email:	JESSICA.DUNAJSKI@PARKS.CA.GOV
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	15751 TESLA RD.
Mailing City,State,Zip:	LIVERMORE, CA 94550
Owner Name:	Jessica Dunajski
Owner Type:	Other
Operator Name:	Jessica Dunajski
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No

JESSICA DUNAJSKI (Continued) **1027080591**

Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20211214
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: JESSICA DUNAJSKI	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	15751 TESLA RD.
Owner/Operator City,State,Zip:	LIVERMORE, CA 94550
Owner/Operator Telephone:	925-447-4630
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: JESSICA DUNAJSKI	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	15751 TESLA RD.
Owner/Operator City,State,Zip:	LIVERMORE, CA 94550
Owner/Operator Telephone:	925-447-4630
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20211214
Handler Name: JESSICA DUNAJSKI	
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	No
Electronic Manifest Broker:	No

JESSICA DUNAJSKI (Continued) **1027080591**

List of NAICS Codes and Descriptions:

NAICS Code:	56299
NAICS Description:	ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

F30 **NNW** **1/8-1/4** **0.137 mi.** **724 ft.**	**STATE OF CALIFORNIA PARKS & RECREATION** **19 FRANKLIN ST.** **SAN JUAN BAUTISTA, CA 95045** **Site 3 of 3 in cluster F**	**RCRA NonGen / NLR**	**1027080844** **CAC003152881**

Relative: **Higher**

Actual: **227 ft.**

RCRA Listings:

Date Form Received by Agency:	20211215
Handler Name:	State Of California Parks & Recreation
Handler Address:	19 FRANKLIN ST.
Handler City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC003152881
Contact Name:	JESSICA DUNAJSKI
Contact Address:	15751 TESLA RD.
Contact City,State,Zip:	LIVERMORE, CA 94550
Contact Telephone:	925-447-4630
Contact Fax:	Not reported
Contact Email:	JESSICA.DUNAJSKI@PARKS.CA.GOV
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	15751 TESLA RD.
Mailing City,State,Zip:	LIVERMORE, CA 94550
Owner Name:	State Of California Parks & Recreat
Owner Type:	Other
Operator Name:	Jessica Dunajski
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No

STATE OF CALIFORNIA PARKS & RECREATION (Continued) **1027080844**

Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20211215
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name:	STATE OF CALIFORNIA PARKS & RECREAT
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	15751 TESLA RD.
Owner/Operator City,State,Zip:	LIVERMORE, CA 94550
Owner/Operator Telephone:	925-447-4630
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name:	JESSICA DUNAJSKI
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	15751 TESLA RD.
Owner/Operator City,State,Zip:	LIVERMORE, CA 94550
Owner/Operator Telephone:	925-447-4630
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

STATE OF CALIFORNIA PARKS & RECREATION (Continued) **1027080844**

Historic Generators:
Receive Date: 20211215
Handler Name: STATE OF CALIFORNIA PARKS & RECREATION
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

D31 **PACIFIC BELL** **RCRA-VSQG** **1000251399**
NW **110 THIRD STREET** **HIST UST** **CAT080022486**
1/8-1/4 **SAN JUAN BAUTISTA, CA 95045**
0.148 mi.
780 ft. **Site 3 of 7 in cluster D**

Relative:
Higher
Actual:
221 ft.

RCRA Listings:
Date Form Received by Agency: 20220727
Handler Name: Pacific Bell
Handler Address: 110 THIRD STREET
Handler City,State,Zip: SAN JUAN BAUTISTA, CA 95045
EPA ID: CAT080022486
Contact Name: ENVIRONMENTAL MANAGER
Contact Address: 308 S AKARD ST
Contact City,State,Zip: DALLAS, TX 75202
Contact Telephone: 800-566-9347 x4
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 09
Land Type: Other
Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Handler Activities
State District Owner: CA
State District: 2
Mailing Address: 308 S AKARD ST
Mailing City,State,Zip: DALLAS, TX 75202
Owner Name: Pacific Bell Telephone Company

PACIFIC BELL (Continued) **1000251399**

Owner Type:	Private
Operator Name:	Pacific Bell Telephone Company
Operator Type:	Private
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20220802
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Hazardous Waste Summary:

Waste Code:	D001
Waste Description:	IGNITABLE WASTE

Handler - Owner Operator:

Owner/Operator Indicator: Owner
Owner/Operator Name: THE PACIFIC TELEPHONE AND TELEGRAPH CO
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: NOT REQUIRED

PACIFIC BELL (Continued) **1000251399**

Owner/Operator City,State,Zip: NOT REQUIRED, ME 99999
Owner/Operator Telephone: 415-555-1212
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: PACIFIC BELL TELEPHONE COMPANY
Legal Status: Private
Date Became Current: 19820723
Date Ended Current: Not reported
Owner/Operator Address: 430 BUSH ST
Owner/Operator City,State,Zip: SAN FRANCISCO, CA 94108
Owner/Operator Telephone: 800-566-9347
Owner/Operator Telephone Ext: 4
Owner/Operator Fax: Not reported
Owner/Operator Email: EHSWASTEMANAGER@ATT.COM

Owner/Operator Indicator: Operator
Owner/Operator Name: PACIFIC BELL TELEPHONE COMPANY
Legal Status: Private
Date Became Current: 19820723
Date Ended Current: Not reported
Owner/Operator Address: 308 S AKARD ST
Owner/Operator City,State,Zip: DALLAS, TX 75202
Owner/Operator Telephone: 800-566-9347
Owner/Operator Telephone Ext: 4
Owner/Operator Fax: Not reported
Owner/Operator Email: EHSWASTEMANAGER@ATT.COM

Historic Generators:
Receive Date: 19810119
Handler Name: PACIFIC BELL
Federal Waste Generator Description: Large Quantity Generator
State District Owner: CA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

Receive Date: 20220727
Handler Name: PACIFIC BELL
Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator
State District Owner: CA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

PACIFIC BELL (Continued) **1000251399**

List of NAICS Codes and Descriptions:

NAICS Code:	51711
NAICS Description:	WIRED AND WIRELESS TELECOMMUNICATIONS CARRIERS (EXCEPT SATELLITE)

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

HIST UST:

Name:	PACIFIC BELL (NE-087)
Address:	110 THIRD STREET
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
File Number:	000297b4
URL:	https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/000297b4.pdf
Region:	STATE
Facility ID:	00000016379
Facility Type:	Other
Other Type:	PHONE CO
Contact Name:	E. J. KOEHLER
Telephone:	4155426758
Owner Name:	PACIFIC BELL
Owner Address:	370 THIRD STREET
Owner City,St,Zip:	SAN FRANCISCO, CA 94107
Total Tanks:	0001

Tank Num:	001
Container Num:	D-84-500
Year Installed:	1984
Tank Capacity:	00000500
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	None

Click here for Geo Tracker PDF:

D32
NW
1/8-1/4
0.148 mi.
780 ft.

PACIFIC BELL (NE-087)
110 3RD ST
SAN JUAN BAUTISTA, CA 95045

Site 4 of 7 in cluster D

SWEEPS UST **S106930318**
N/A

Relative:
Higher

Actual:
221 ft.

SWEEPS UST:

Name:	PACIFIC BELL (NE-087)
Address:	110 3RD ST
City:	SAN JUAN BAUTISTA
Status:	Active
Comp Number:	16379
Number:	9
Board Of Equalization:	44-019621
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88

PACIFIC BELL (NE-087) (Continued) **S106930318**

Owner Tank Id:	D-84-500
SWRCB Tank Id:	35-000-016379-000001
Tank Status:	A
Capacity:	500
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	1

D33
NW
1/8-1/4
0.148 mi.
780 ft.

AT&T CALIFORNIA - NE087
110 THIRD ST
SAN JUAN BAUTISTA, CA 95045

UST **U004261602**
N/A

Site 5 of 7 in cluster D

Relative:
Higher

Actual:
221 ft.

UST:

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Facility ID:	08-061
Permitting Agency:	San Benito County Health Department
CERSID:	10441423
Latitude:	Not reported
Longitude:	Not reported
Owner type:	Not reported
Facility type:	Not reported
Num of inuse ust:	Not reported
Num of closed ust:	Not reported
Num of oos ust:	Not reported
Epa region:	Not reported
Tribal lands:	Not reported
Tank owner name:	Not reported
Tank owner mailing address:	Not reported
Tank owner mailing city:	Not reported
Tank owner mailing zip:	Not reported
Tank owner mailing state:	Not reported
Tank operator name:	Not reported
Tank operator mailing address:	Not reported
Tank operator mailing city:	Not reported
Tank operator mailing zip:	Not reported
Tank operator mailing state:	Not reported
Tankidnumber:	Not reported
Tank status:	Not reported
Tank configuration:	Not reported
Tank closure date:	Not reported
Tank installation date:	Not reported
Tank num of compartments:	Not reported
Tank contents:	Not reported
Tank capacity gallons:	Not reported
Tank type:	Not reported
Tank pc construction:	Not reported
Tank pwpiping construction:	Not reported
Tank piping type:	Not reported
Tank piping construction:	Not reported
Tank sacrificial anode:	Not reported
Tank cp impressed current:	Not reported
Tank cp shutoff:	Not reported

AT&T CALIFORNIA - NE087 (Continued) **U004261602**

Tank alarms:	Not reported
Tank ball float:	Not reported
Tank spill bucket:	Not reported

D34
NW
1/8-1/4
0.148 mi.
780 ft.

SBC SAN JUAN BAUTISTA
110 3RD. STREET
SAN JUAN BAUTISTA, CA 95045

Site 6 of 7 in cluster D

UST **U003782398** **N/A**

Relative: Higher

Actual: 221 ft.

UST:

Name:	SBC SAN JUAN BAUTISTA
Address:	110 3RD. STREET
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Facility ID:	35-03-03
Permitting Agency:	SAN BENITO COUNTY
CERSID:	Not reported
Latitude:	36.844241799372
Longitude:	-121.535621881485
Owner type:	Not reported
Facility type:	Not reported
Num of inuse ust:	Not reported
Num of closed ust:	Not reported
Num of oos ust:	Not reported
Epa region:	Not reported
Tribal lands:	Not reported
Tank owner name:	Not reported
Tank owner mailing address:	Not reported
Tank owner mailing city:	Not reported
Tank owner mailing zip:	Not reported
Tank owner mailing state:	Not reported
Tank operator name:	Not reported
Tank operator mailing address:	Not reported
Tank operator mailing city:	Not reported
Tank operator mailing zip:	Not reported
Tank operator mailing state:	Not reported
Tankidnumber:	Not reported
Tank status:	Not reported
Tank configuration:	Not reported
Tank closure date:	Not reported
Tank installation date:	Not reported
Tank num of compartments:	Not reported
Tank contents:	Not reported
Tank capacity gallons:	Not reported
Tank type:	Not reported
Tank pc construction:	Not reported
Tank pwpiping construction:	Not reported
Tank piping type:	Not reported
Tank piping construction:	Not reported
Tank sacrificial anode:	Not reported
Tank cp impressed current:	Not reported
Tank cp shutoff:	Not reported
Tank alarms:	Not reported
Tank ball float:	Not reported
Tank spill bucket:	Not reported

D35 **AT&T CALIFORNIA - NE087** **CUPA Listings** **S120050192**
NW **110 THIRD ST** **N/A**
1/8-1/4 **SAN JUAN BAUTISTA, CA**
0.148 mi.
780 ft. **Site 7 of 7 in cluster D**

Relative:
Higher

Actual:
221 ft.

CUPA SAN BENITO:

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0001082
Program/Element Code:	7006
Program/Element:	7006 - HAZARDOUS WASTE GENERATORS RANGE 1 BILLING
Billing Status:	02 - INACTIVE, NON-BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	Not reported
Longitude:	Not reported

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0001061
Program/Element Code:	4100
Program/Element:	4100 - UST OPERATING PERMIT
Billing Status:	01 - ACTIVE, BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	0
Longitude:	0

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0001029
Program/Element Code:	4400
Program/Element:	4400 - HAZARDOUS WASTE GENERATORS RANGE 1
Billing Status:	01 - ACTIVE, BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	0
Longitude:	0

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0000593
Program/Element Code:	4206
Program/Element:	4206 - HAZMAT BUSINESS PLAN GENERAL
Billing Status:	01 - ACTIVE, BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	0
Longitude:	0

AT&T CALIFORNIA - NE087 (Continued) **S120050192**

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0000027
Program/Element Code:	7000
Program/Element:	7000 - HAZMAT BUSINESS PLAN RANGE 1 BILLING
Billing Status:	01 - ACTIVE, BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	Not reported
Longitude:	Not reported

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0000028
Program/Element Code:	7006
Program/Element:	7006 - HAZARDOUS WASTE GENERATORS RANGE 1 BILLING
Billing Status:	02 - INACTIVE, NON-BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	Not reported
Longitude:	Not reported

Name:	AT&T CALIFORNIA - NE087
Address:	110 THIRD ST
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000013
Record ID:	PR0000029
Program/Element Code:	4100
Program/Element:	4100 - UST OPERATING PERMIT
Billing Status:	02 - INACTIVE, NON-BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10441423
Latitude:	0
Longitude:	0

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36 **CITY OF SAN JUAN BAUTISTA** **CUPA Listings** **S123490966**
ESE **196 SAN JUAN HOLLISTER RD** **CERS** **N/A**
1/8-1/4 **SAN JUAN BAUTISTA, CA 95045**
0.185 mi.
975 ft.

Relative:
Lower

Actual:
202 ft.

CUPA SAN BENITO:

Name:	CITY OF SAN JUAN BAUTISTA
Address:	196 SAN JUAN HOLLISTER RD
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000267
Record ID:	PR0001510
Program/Element Code:	4400
Program/Element:	4400 - HAZARDOUS WASTE GENERATORS RANGE 1
Billing Status:	02 - INACTIVE, NON-BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10634986
Latitude:	0
Longitude:	0

CITY OF SAN JUAN BAUTISTA (Continued) **S123490966**

Name:	CITY OF SAN JUAN BAUTISTA
Address:	196 SAN JUAN HOLLISTER RD
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000267
Record ID:	PR0000644
Program/Element Code:	4206
Program/Element:	4206 - HAZMAT BUSINESS PLAN GENERAL
Billing Status:	01 - ACTIVE, BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10634986
Latitude:	0
Longitude:	0

Name:	CITY OF SAN JUAN BAUTISTA
Address:	196 SAN JUAN HOLLISTER RD
City,State,Zip:	SAN JUAN BAUTISTA, CA
Facility ID:	FA0000267
Record ID:	PR0000526
Program/Element Code:	7000
Program/Element:	7000 - HAZMAT BUSINESS PLAN RANGE 1 BILLING
Billing Status:	01 - ACTIVE, BILLABLE
Surcharge Program/Element:	(none)
CERS ID:	10634986
Latitude:	Not reported
Longitude:	Not reported

CERS:

Name:	CITY OF SAN JUAN BAUTISTA
Address:	196 SAN JUAN HOLLISTER RD
City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
Site ID:	333725
CERS ID:	10634986
CERS Description:	Chemical Storage Facilities

Violations:

Site ID:	333725
Site Name:	CITY OF SAN JUAN BAUTISTA
Violation Date:	01-11-2019
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit a site map with all required content.
Violation Notes:	Returned to compliance on 01/16/2019. submit via CERS a facility site map with all the required elements
Violation Division:	San Benito County Health Department
Violation Program:	HMRRP
Violation Source:	CERS,

Site ID:	333725
Site Name:	CITY OF SAN JUAN BAUTISTA
Violation Date:	01-11-2019
Citation:	HSC 6.95 25505(a)(4) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)(4)
Violation Description:	Failure to provide initial and annual training to all employees in safety procedures in the event of a release or threatened release of a hazardous material or failure to document and maintain training records for a minimum of three years.

CITY OF SAN JUAN BAUTISTA (Continued) **S123490966**

Violation Notes: Returned to compliance on 03/26/2019. provide employees training on the emergency response plan
Violation Division: San Benito County Health Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-13-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Benito County Health Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-11-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Benito County Health Department
Eval Program: HMRRP
Eval Source: CERS,

Enforcement Action:
Site ID: 333725
Site Name: CITY OF SAN JUAN BAUTISTA
Site Address: 196 SAN JUAN HOLLISTER RD
Site City: SAN JUAN BAUTISTA
Site Zip: 95045
Enf Action Date: 01-11-2019
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Benito County Health Department
Enf Action Program: HMRRP
Enf Action Source: CERS,

Affiliation:
Affiliation Type Desc: Document Preparer
Entity Name: nicholas bryan
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: PO Box 1420
Affiliation City: San Juan Bautista
Affiliation State: CA

CITY OF SAN JUAN BAUTISTA (Continued) **S123490966**

Affiliation Country:	Not reported
Affiliation Zip:	95045
Affiliation Phone:	,
Affiliation Type Desc:	Legal Owner
Entity Name:	CITY OF SAN JUAN BAUTISTA
Entity Title:	Not reported
Affiliation Address:	PO Box 1420
Affiliation City:	San Juan Bautista
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95045
Affiliation Phone:	(831) 623-4661,
Affiliation Type Desc:	CUPA District
Entity Name:	San Benito County Health Department
Entity Title:	Not reported
Affiliation Address:	1111 San Felipe Road, Suite 102
Affiliation City:	Hollister
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95023
Affiliation Phone:	(831) 636-4035,
Affiliation Type Desc:	Property Owner
Entity Name:	City of San Juan Bautista
Entity Title:	Not reported
Affiliation Address:	PO Box 1420
Affiliation City:	San Juan Bautista
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95045
Affiliation Phone:	(831) 623-4661,
Affiliation Type Desc:	Identification Signer
Entity Name:	nicholas bryan
Entity Title:	supervisor
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,
Affiliation Type Desc:	Operator
Entity Name:	Danny Gonzalez
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(831) 537-5057,
Affiliation Type Desc:	Parent Corporation
Entity Name:	CITY OF SAN JUAN BAUTISTA
Entity Title:	Not reported

CITY OF SAN JUAN BAUTISTA (Continued) **S123490966**

Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,

Affiliation Type Desc:	Environmental Contact
Entity Name:	Nicholas bryan
Entity Title:	Not reported
Affiliation Address:	PO Box 1420
Affiliation City:	San Juan Bautista
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95045
Affiliation Phone:	,

G37
SE
1/8-1/4
0.196 mi.
1033 ft.

MIDNIGHT EXPRESS TRANSPORTATION INC — **RCRA NonGen / NLR** — **1026479312**
451 OLD SAN JUAN HOLLISTER RD — **CAC003085234**
HOLLISTER, CA 95045

Site 1 of 2 in cluster G

Relative:
Higher

Actual:
209 ft.

RCRA Listings:

Date Form Received by Agency:	20200923
Handler Name:	Midnight Express Transportation Inc
Handler Address:	451 OLD SAN JUAN HOLLISTER RD
Handler City,State,Zip:	HOLLISTER, CA 95045
EPA ID:	CAC003085234
Contact Name:	CYNTHIA OROZCO
Contact Address:	381 HOWARD CT
Contact City,State,Zip:	HOLLISTER, CA 95023
Contact Telephone:	831-207-7765
Contact Fax:	Not reported
Contact Email:	CYNTHIA@MIDNIGHTEXPRESS.COMPANY
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	PO BOX 1712
Mailing City,State,Zip:	HOLLISTER, CA 95024
Owner Name:	Maria Cynthia Orozco
Owner Type:	Other
Operator Name:	Cynthia Orozco
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No

MIDNIGHT EXPRESS TRANSPORTATION INC (Continued) **1026479312**

Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20200927
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name: CYNTHIA OROZCO	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	381 HOWARD CT
Owner/Operator City,State,Zip:	HOLLISTER, CA 95023
Owner/Operator Telephone:	831-207-7765
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name: MARIA CYNTHIA OROZCO	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	PO BOX 1712
Owner/Operator City,State,Zip:	HOLLISTER, CA 95024
Owner/Operator Telephone:	831-207-7765

MIDNIGHT EXPRESS TRANSPORTATION INC (Continued) **1026479312**

Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20200923
Handler Name:	MIDNIGHT EXPRESS TRANSPORTATION INC
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Code:	324191
NAICS Description:	PETROLEUM LUBRICATING OIL AND GREASE MANUFACTURING

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

G38 **SE** **1/8-1/4** **0.196 mi.** **1033 ft.**	**MIDNIGHT EXPRESS TRANSPORTATION INC** **451 OLD SAN JUAN HOLLISTER RD** **SAN JUAN BAUTISTA, CA 95045** **Site 2 of 2 in cluster G**	**RCRA NonGen / NLR**	**1025859750** **CAC003151522**

Relative: **Higher**

Actual: **209 ft.**

RCRA Listings:

Date Form Received by Agency:	20211206
Handler Name:	Midnight Express Transportation Inc
Handler Address:	451 OLD SAN JUAN HOLLISTER RD
Handler City,State,Zip:	SAN JUAN BAUTISTA, CA 95045
EPA ID:	CAC003151522
Contact Name:	CYNTHIA OROZCO
Contact Address:	PO BOX 1712
Contact City,State,Zip:	HOLLISTER, CA 95024
Contact Telephone:	831-207-7765
Contact Fax:	Not reported
Contact Email:	CYNTHIA@MIDNIGHTEXPRESS.COMPANY
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported

MIDNIGHT EXPRESS TRANSPORTATION INC (Continued) **1025859750**

State District:	Not reported
Mailing Address:	PO BOX 1712
Mailing City,State,Zip:	HOLLISTER, CA 95024
Owner Name:	Cynthia Orozco
Owner Type:	Other
Operator Name:	Cynthia Orozco
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20211207
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: CYNTHIA OROZCO	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	PO BOX 1712
Owner/Operator City,State,Zip:	HOLLISTER, CA 95024

MIDNIGHT EXPRESS TRANSPORTATION INC (Continued) **1025859750**

Owner/Operator Telephone: 831-207-7765
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: CYNTHIA OROZCO
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 1712
Owner/Operator City,State,Zip: HOLLISTER, CA 95024
Owner/Operator Telephone: 831-207-7765
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20211206
Handler Name: MIDNIGHT EXPRESS TRANSPORTATION INC
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 488490
NAICS Description: OTHER SUPPORT ACTIVITIES FOR ROAD TRANSPORTATION

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

Count: 15 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
AROMAS	1023358632	AROMAS/SAN JUAN HIGH SCHOOL	CHITTENDEN RD/SAN JUAN HWY	95045	FINDS
HOLLISTER	S126984002	DOMESTIC WASTE TREATMENT FACILITY	NW CORNER SAN JUAN RD & HWY 15	95045	SWF/LF
SAN JUAN BAUTISTA	1016293800	SAN JUAN UNION ELEMENTARY SD	ALAMEDA & NYLAND	95045	FINDS
SAN JUAN BAUTISTA	S122249129	SAN JUAN HIGHWAY	FROM ANZAR HIGH SCHOOL TO CITY	95045	NPDES
SAN JUAN BAUTISTA	S126984005	BOTELHO BROTHERS PROPERTY	N OF 2401 ON SAN JUAN HWY	95045	SWF/LF
SAN JUAN BAUTISTA	S120050246	CITY OF SAN JUAN BAUTISTA	500 SAN JUAN CANYON RD		CUPA Listings
SAN JUAN BAUTISTA	S121671050	SAN JUAN HIGHWAY AT CHITTENDEN	SAN JUAN HIGHWAY AT CHITTENDEN		CIWQS
SAN JUAN BAUTISTA	S114731025	OLD SAN JUAN DUMP	2570 SAN JUAN HWY		RGA LF
SAN JUAN BAUTISTA	S114731024	OLD SAN JUAN DUMP	2570 SAN JUAN HWY, SAN JUAN BA		RGA LF
SAN JUAN BAUTISTA	S106102197	RMC PAC MATERIALS INC SAN JUAN	960 SAN JUAN HWY	95045	WDS
SAN JUAN BAUTISTA	1027090848	AROMAS SAN JUAN UNIFIED SCHOOL DIS	2320 SAN JUAN HWY	95045	RCRA NonGen / NLR
SAN JUAN BAUTISTA	1024906477	SAN JUAN PIT MILL	2401 SAN JUAN HWY ROAD	95045	US MINES, ABANDONED MINES
SAN JUAN BAUTISTA	1025966136	AROMAS SAN JUAN UNIFIED SCHOOL	2300 SAN JUAN HWY	95045	FINDS
SAN JUAN BAUTISTA	1025831146	AROMAS SAN JUAN UNIFIED SCHOOL	2300 SAN JUAN HWY	95045	RCRA NonGen / NLR
SAN JUAN BAUTISTA	1023371772	CITY OF SAN JUAN BAUTISTA	500 SAN JUAN CANYON RD	95045	FINDS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 25

Source: EPA
Telephone: N/A
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/25/2023	Source: EPA
Date Data Arrived at EDR: 02/02/2023	Telephone: N/A
Date Made Active in Reports: 02/28/2023	Last EDR Contact: 05/02/2023
Number of Days to Update: 26	Next Scheduled EDR Contact: 07/10/2023
	Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/20/2022	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/21/2022	Telephone: 703-603-8704
Date Made Active in Reports: 03/10/2023	Last EDR Contact: 03/28/2023
Number of Days to Update: 79	Next Scheduled EDR Contact: 07/10/2023
	Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/25/2023	Source: EPA
Date Data Arrived at EDR: 02/02/2023	Telephone: 800-424-9346
Date Made Active in Reports: 02/28/2023	Last EDR Contact: 05/02/2023
Number of Days to Update: 26	Next Scheduled EDR Contact: 07/24/2023
	Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/06/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/09/2023	Telephone: (415) 495-8895
Date Made Active in Reports: 03/20/2023	Last EDR Contact: 03/09/2023
Number of Days to Update: 11	Next Scheduled EDR Contact: 07/03/2023
	Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/06/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/09/2023	Telephone: (415) 495-8895
Date Made Active in Reports: 03/20/2023	Last EDR Contact: 03/09/2023
Number of Days to Update: 11	Next Scheduled EDR Contact: 07/03/2023
	Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/08/2023	Source: Department of the Navy
Date Data Arrived at EDR: 02/09/2023	Telephone: 843-820-7326
Date Made Active in Reports: 05/02/2023	Last EDR Contact: 05/03/2023
Number of Days to Update: 82	Next Scheduled EDR Contact: 08/21/2023
	Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/20/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/21/2023	Telephone: 703-603-0695
Date Made Active in Reports: 05/02/2023	Last EDR Contact: 02/21/2023
Number of Days to Update: 70	Next Scheduled EDR Contact: 06/05/2023
	Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/20/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/21/2023	Telephone: 703-603-0695
Date Made Active in Reports: 05/02/2023	Last EDR Contact: 02/21/2023
Number of Days to Update: 70	Next Scheduled EDR Contact: 06/05/2023
	Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/12/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 12/19/2022
Number of Days to Update: 5

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Lists of state- and tribal (Superfund) equivalent sites

RESPONSE: State Response Sites
Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

ENVIROSTOR: EnviroStor Database
The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF (SWIS): Solid Waste Information System
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/26/2023
Number of Days to Update: 78

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/07/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Quarterly

Lists of state and tribal leaking storage tanks

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/30/2023
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/26/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/19/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 134

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)

Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 10/14/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 02/01/2022
Number of Days to Update: 88

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/22/2023
Number of Days to Update: 82

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Semi-Annually

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/19/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 134

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

Lists of state and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/17/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

Lists of state and tribal brownfield sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/14/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 04/06/2023
Date Data Arrived at EDR: 04/13/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/22/2023
Number of Days to Update: 82

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 11/16/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 83

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 01/06/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 8

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2022
Date Made Active in Reports: 02/09/2023
Number of Days to Update: 71

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 01/05/2023
Date Data Arrived at EDR: 01/06/2023
Date Made Active in Reports: 01/11/2023
Number of Days to Update: 5

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 01/06/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 8

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 02/03/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/25/2023
Number of Days to Update: 77

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 01/06/2023
Date Data Arrived at EDR: 01/06/2023
Date Made Active in Reports: 01/11/2023
Number of Days to Update: 5

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 02/23/2023
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 03/23/2023
Number of Days to Update: 27

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing
Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 76

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/13/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/10/2023
Number of Days to Update: 86

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 08/02/2022
Date Data Arrived at EDR: 10/17/2022
Date Made Active in Reports: 01/04/2023
Number of Days to Update: 79

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/30/2023
Number of Days to Update: 23

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA’s comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 02/01/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 77

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/11/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/03/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/13/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/10/2023
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/01/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/04/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/13/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 02/16/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 75

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/16/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 01/17/2023
Date Data Arrived at EDR: 01/18/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 91

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Annually

ROD: Records Of Decision
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Annually

RMP: Risk Management Plans
When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/27/2022
Date Data Arrived at EDR: 05/04/2022
Date Made Active in Reports: 05/10/2022
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/27/2022
Date Data Arrived at EDR: 11/01/2022
Date Made Active in Reports: 11/15/2022
Number of Days to Update: 14

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/03/2022
Date Data Arrived at EDR: 01/04/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 89

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/26/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 12/05/2022
Number of Days to Update: 13

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/22/2022
Number of Days to Update: 84

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/03/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 02/27/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/06/2019	Telephone: 202-566-0517
Date Made Active in Reports: 02/10/2020	Last EDR Contact: 05/04/2023
Number of Days to Update: 96	Next Scheduled EDR Contact: 08/14/2023
	Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 07/01/2019	Telephone: 202-343-9775
Date Made Active in Reports: 09/23/2019	Last EDR Contact: 03/23/2023
Number of Days to Update: 84	Next Scheduled EDR Contact: 07/10/2023
	Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2007
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2008
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020	Source: Department of Transporation, Office of Pipeline Safety
Date Data Arrived at EDR: 01/28/2020	Telephone: 202-366-4595
Date Made Active in Reports: 04/17/2020	Last EDR Contact: 04/25/2023
Number of Days to Update: 80	Next Scheduled EDR Contact: 08/07/2023
	Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 85

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/03/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 07/26/2021
Date Data Arrived at EDR: 07/27/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 87

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/13/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 11/17/2022
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 85

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/22/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 02/27/2023
Date Data Arrived at EDR: 03/01/2023
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 23

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/24/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011	Source: USGS
Date Data Arrived at EDR: 06/08/2011	Telephone: 703-648-7709
Date Made Active in Reports: 09/13/2011	Last EDR Contact: 02/24/2023
Number of Days to Update: 97	Next Scheduled EDR Contact: 06/05/2023
	Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/20/2022	Source: Department of Interior
Date Data Arrived at EDR: 12/20/2022	Telephone: 202-208-2609
Date Made Active in Reports: 03/10/2023	Last EDR Contact: 03/16/2023
Number of Days to Update: 80	Next Scheduled EDR Contact: 06/19/2023
	Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/02/2023	Source: EPA
Date Data Arrived at EDR: 02/28/2023	Telephone: (415) 947-8000
Date Made Active in Reports: 03/24/2023	Last EDR Contact: 02/28/2023
Number of Days to Update: 24	Next Scheduled EDR Contact: 06/12/2023
	Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/01/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/04/2023	Telephone: 202-564-2280
Date Made Active in Reports: 04/03/2023	Last EDR Contact: 03/31/2023
Number of Days to Update: 89	Next Scheduled EDR Contact: 07/17/2023
	Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/21/2021	Telephone: 202-564-0527
Date Made Active in Reports: 08/11/2021	Last EDR Contact: 02/24/2023
Number of Days to Update: 82	Next Scheduled EDR Contact: 06/05/2023
	Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 11/09/2021
Date Data Arrived at EDR: 10/20/2022
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 82

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/13/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 64

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 02/23/2022
Date Data Arrived at EDR: 07/08/2022
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 123

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 01/03/2022
Date Data Arrived at EDR: 03/31/2022
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 222

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/05/2023
Number of Days to Update: 59

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

AQUEOUS FOAM: Former Fire Training Facility Assessments Listing

Airports shown on this list are those believed to use Aqueous Film Forming Foam (AFFF), and certified by the Federal Aviation Administration (FAA) under Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139). This list was created by SWRCB using information available from the FAA. Location points shown are from the latitude and longitude listed on the FAA airport master record.

Date of Government Version: 09/06/2022
Date Data Arrived at EDR: 09/06/2022
Date Made Active in Reports: 10/26/2022
Number of Days to Update: 50

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/14/2022	Source: CAL EPA/Office of Emergency Information
Date Data Arrived at EDR: 12/14/2022	Telephone: 916-323-3400
Date Made Active in Reports: 03/07/2023	Last EDR Contact: 03/21/2023
Number of Days to Update: 83	Next Scheduled EDR Contact: 07/03/2023
	Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 12/07/2021	Source: Livermore-Pleasanton Fire Department
Date Data Arrived at EDR: 05/09/2022	Telephone: 925-454-2361
Date Made Active in Reports: 05/17/2022	Last EDR Contact: 02/10/2023
Number of Days to Update: 8	Next Scheduled EDR Contact: 05/22/2023
	Data Release Frequency: Varies

DRYCLEAN BUTTE CO DIST: Butte County Air Quality Management DistrictDrycleaner Facility Listing

Butte County Air Quality Management DistrictDrycleaner Facility Listing.

Date of Government Version: 12/31/2018	Source: Butte County Air Quality Management District
Date Data Arrived at EDR: 04/23/2019	Telephone: 530-332-9400
Date Made Active in Reports: 05/01/2023	Last EDR Contact: 04/24/2023
Number of Days to Update: 1469	Next Scheduled EDR Contact: 06/12/2023
	Data Release Frequency: Varies

DRYCLEAN CALAVERAS CO DIST: Calaveras County Environmental Management Agency Drycleaner Facility Listing

A listing of drycleaner facility locations, for the Calaveras County Environmental Management Agency.

Date of Government Version: 06/17/2019	Source: Calaveras County Environmental Management Agency
Date Data Arrived at EDR: 06/19/2019	Telephone: 209-754-6399
Date Made Active in Reports: 05/01/2023	Last EDR Contact: 04/24/2023
Number of Days to Update: 1412	Next Scheduled EDR Contact: 09/16/2019
	Data Release Frequency: Varies

DRYCLEAN EAST KERN DIST: Eastern Kern Air Pollution Control District District Drycleaner Facility Listing

A listing of drycleaner facility locations, for the Eastern Kern Air Pollution Control District.

Date of Government Version: 04/17/2019	Source: Eastern Kern Air Pollution Control District
Date Data Arrived at EDR: 04/17/2019	Telephone: 661-862-9684
Date Made Active in Reports: 05/01/2023	Last EDR Contact: 04/25/2023
Number of Days to Update: 1475	Next Scheduled EDR Contact: 06/12/2023
	Data Release Frequency: Varies

DRYCLEAN GLENN CO DIST: Glenn County Air Pollution Control District Drycleaner Facility Listing

A listing of drycleaner facility locations, for the Glenn County Air Pollution Control District.

Date of Government Version: 04/17/2019	Source: Glenn County Air Pollution Control District
Date Data Arrived at EDR: 04/17/2019	Telephone: 530-934-6500
Date Made Active in Reports: 05/01/2023	Last EDR Contact: 04/16/2019
Number of Days to Update: 1475	Next Scheduled EDR Contact: 06/12/2023
	Data Release Frequency: Varies

DRYCLEAN GRANT: Grant Recipients List

Assembly Bill 998 (AB 998) established the Non-Toxic Dry Cleaning Incentive Program to provide financial assistance to the dry cleaning industry to switch from systems using perchloroethylene (Perc), an identified toxic air contaminant and potential human carcinogen, to non-toxic and non-smog forming alternatives.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 816

Source: California Air Resources Board
Telephone: 916-323-0006
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

DRYCLEAN IMPERIAL CO DIST: Imperial County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Imperial County Air Pollution Control District

Date of Government Version: 05/14/2019
Date Data Arrived at EDR: 05/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1445

Source: Imperial County Air Pollution Control District
Telephone: 442-265-1800
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN LAKE CO DIST: Lake County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Lake County Air Quality Management District,

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1455

Source: Lake County Air Quality Management District
Telephone: 707-263-7000
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN MENDO CO DIST: Mendocino County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mendocino County Air Quality Management District.

Date of Government Version: 02/08/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1441

Source: Mendocino County Air Quality Management District
Telephone: 707-463-4354
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN MOJAVE DESERT DIST: Mojave Desert Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mojave Desert Air Quality Management District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Mojave Desert Air Quality Management District
Telephone: 760-245-1661
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN MONTEREY BAY DIST: Monterey Bay Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Monterey Bay Air Quality Management District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Monterey Bay Air Quality Management District
Telephone: 831-647-9411
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN NO COAST UNIFIED DIST: North Coast Unified Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the North Coast Unified Air Quality Management District.

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: North Coast Unified Air Quality Management District
Telephone: 707-443-3093
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN NO SIERRA DIST: Northern Sierra Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sierra Air Quality Management District,

Date of Government Version: 05/07/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1455

Source: Northern Sierra Air Quality Management District
Telephone: 530-274-9350
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 11/17/2022
Date Data Arrived at EDR: 11/30/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 76

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 11/14/2022
Date Data Arrived at EDR: 11/14/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 79

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN SACRAMENTO METO DIST: Sacramento Metropolitan Air Quality Management DistrictDrycleaner Facility Listing
A listing of drycleaner facility locations, for the Sacramento Metropolitan Air Quality Management District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1467

Source: Sacramento Metropolitan Air Quality Management District
Telephone: 916-874-3958
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN SANTA BARB CO DIST: Santa Barbara County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Santa Barbara County Air Pollution Control District.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Santa Barbara County Air Pollution Control District
Telephone: 805-961-8867
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SAN JOAQ VAL DIST: San Joaquin Valley Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Joaquin Valley Air Pollution Control District.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/03/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1459

Source: San Joaquin Valley Air Pollution Control District
Telephone: 559-230-6001
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SAN LUIS OB CO DIST: San Luis Obispo County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Luis Obispo County Air Pollution Control District.

Date of Government Version: 04/23/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1467

Source: San Luis Obispo County Air Pollution Control District
Telephone: 805-781-5756
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN SAN DIEGO CO DIST: San Diego County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Diego County Air Pollution Control District.

Date of Government Version: 02/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1461

Source: San Diego County Air Pollution Control District
Telephone: 858-586-2616
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SHASTA CO DIST: Shasta County Air Quality Management District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Shasta County Air Quality Management District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: Shasta County Air Quality Management District
Telephone: 530-225-5674
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN TEHAMA CO DIST: Tehama County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Tehama County Air Pollution Control District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1468

Source: Tehama County Air Pollution Control District
Telephone: 530-527-3717
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN YOLO-SOLANO DIST: Yolo-Solano Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Yolo-Solano Air Quality Management District.

Date of Government Version: 05/31/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1425

Source: Yolo-Solano Air Quality Management District
Telephone: 530-757-3650
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/27/2021
Date Data Arrived at EDR: 09/01/2021
Date Made Active in Reports: 11/19/2021
Number of Days to Update: 79

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 01/24/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Annually

DRYCLEAN VENTURA CO DIST: Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Ventura County Air Pollution Control District.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Ventura County Air Pollution Control District
Telephone: 805-645-1421
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN NO SONOMA CO DIST: Norther Sonoma County County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sonoma County Air Pollution Control District.,

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Santa Barbara County Air Pollution Control District
Telephone: 707-433-5911
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN PLACER CO DIST: Placer County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Placer County Air Quality Management District.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: Placer County Air Quality Management District
Telephone: 530-745-2335
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN BAY AREA DIST: Bay Area Air Quality Management District Drycleaner Facility Listing
Bay Area Air Quality Management District Drycleaner Facility Listing.

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1432

Source: Bay Area Air Quality Management District
Telephone: 415-516-1916
Last EDR Contact: 04/24/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/13/2022
Date Made Active in Reports: 08/30/2022
Number of Days to Update: 78

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 01/10/2023
Date Data Arrived at EDR: 01/18/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 76

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 01/11/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/08/2022
Date Data Arrived at EDR: 11/23/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 82

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/10/2022
Date Data Arrived at EDR: 11/10/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 83

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/10/2022
Date Data Arrived at EDR: 11/10/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 83

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/03/2023
Date Data Arrived at EDR: 01/04/2023
Date Made Active in Reports: 03/21/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Quarterly

HAZNET: Facility and Manifest Data
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 07/05/2022
Date Made Active in Reports: 09/19/2022
Number of Days to Update: 76

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Annually

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/22/2023
Number of Days to Update: 82

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 10/31/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 77

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/28/2023
Number of Days to Update: 80

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/07/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 77

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/07/2022
Date Data Arrived at EDR: 12/07/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Annually

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 07/01/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 90

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/13/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System
The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 76

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data
The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 01/05/2023
Date Data Arrived at EDR: 01/06/2023
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 4

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)
Non-Case Information sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)
Other Oil & Gas Projects sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 03/06/2023	Source: State Water Resources Control Board
Date Data Arrived at EDR: 03/07/2023	Telephone: 866-480-1028
Date Made Active in Reports: 03/31/2023	Last EDR Contact: 03/07/2023
Number of Days to Update: 24	Next Scheduled EDR Contact: 06/19/2023
	Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 03/06/2023	Source: State Water Resources Control Board
Date Data Arrived at EDR: 03/07/2023	Telephone: 866-480-1028
Date Made Active in Reports: 03/31/2023	Last EDR Contact: 03/07/2023
Number of Days to Update: 24	Next Scheduled EDR Contact: 06/19/2023
	Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 03/06/2023	Source: State Water Resources Control Board
Date Data Arrived at EDR: 03/07/2023	Telephone: 866-480-1028
Date Made Active in Reports: 03/31/2023	Last EDR Contact: 03/07/2023
Number of Days to Update: 24	Next Scheduled EDR Contact: 06/19/2023
	Data Release Frequency: Varies

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011	Source: EPA, Office of Water
Date Data Arrived at EDR: 08/05/2011	Telephone: 202-564-2496
Date Made Active in Reports: 09/29/2011	Last EDR Contact: 03/30/2023
Number of Days to Update: 55	Next Scheduled EDR Contact: 07/17/2023
	Data Release Frequency: No Update Planned

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 08/23/2022	Source: USGS
Date Data Arrived at EDR: 11/22/2022	Telephone: 703-648-6533
Date Made Active in Reports: 02/28/2023	Last EDR Contact: 02/24/2023
Number of Days to Update: 98	Next Scheduled EDR Contact: 06/05/2023
	Data Release Frequency: Varies

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014	Source: EPA
Date Data Arrived at EDR: 02/05/2015	Telephone: 202-564-2497
Date Made Active in Reports: 03/06/2015	Last EDR Contact: 03/30/2023
Number of Days to Update: 29	Next Scheduled EDR Contact: 07/17/2023
	Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI
Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 03/07/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

HWTS: Hazardous Waste Tracking System

DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 04/05/2022
Date Data Arrived at EDR: 04/05/2022
Date Made Active in Reports: 04/26/2022
Number of Days to Update: 21

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A	Source: Department of Resources Recycling and Recovery
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 01/13/2014	Last EDR Contact: 06/01/2012
Number of Days to Update: 196	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A	Source: State Water Resources Control Board
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 12/30/2013	Last EDR Contact: 06/01/2012
Number of Days to Update: 182	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019	Source: Alameda County Environmental Health Services
Date Data Arrived at EDR: 01/11/2019	Telephone: 510-567-6700
Date Made Active in Reports: 03/05/2019	Last EDR Contact: 03/29/2023
Number of Days to Update: 53	Next Scheduled EDR Contact: 07/17/2023
	Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 12/28/2022	Source: Alameda County Environmental Health Services
Date Data Arrived at EDR: 12/28/2022	Telephone: 510-567-6700
Date Made Active in Reports: 03/17/2023	Last EDR Contact: 03/29/2023
Number of Days to Update: 79	Next Scheduled EDR Contact: 07/17/2023
	Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 01/31/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 76

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 12/13/2022
Date Data Arrived at EDR: 12/15/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 6

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 12/28/2022
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 05/04/2022
Date Data Arrived at EDR: 05/06/2022
Date Made Active in Reports: 07/28/2022
Number of Days to Update: 83

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/08/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 09/01/2022
Number of Days to Update: 23

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 06/28/2021
Date Data Arrived at EDR: 12/21/2021
Date Made Active in Reports: 03/03/2022
Number of Days to Update: 72

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/12/2021
Date Data Arrived at EDR: 08/12/2021
Date Made Active in Reports: 11/08/2021
Number of Days to Update: 88

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 01/13/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 01/30/2023
Date Data Arrived at EDR: 02/01/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 77

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 01/30/2023
Date Data Arrived at EDR: 02/01/2023
Date Made Active in Reports: 04/21/2023
Number of Days to Update: 79

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 11/04/2022
Date Data Arrived at EDR: 11/07/2022
Date Made Active in Reports: 01/25/2023
Number of Days to Update: 79

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/09/2023
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 03/29/2023
Number of Days to Update: 76

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/09/2023
Date Data Arrived at EDR: 01/10/2023
Date Made Active in Reports: 03/23/2023
Number of Days to Update: 72

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/11/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 03/29/2023
Number of Days to Update: 76

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory

A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills

This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 01/10/2022
Date Data Arrived at EDR: 01/12/2022
Date Made Active in Reports: 04/04/2022
Number of Days to Update: 82

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory

A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 11/01/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/24/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory

A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 11/01/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/24/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 05/26/2021
Date Data Arrived at EDR: 07/09/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 82

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/18/2022
Date Data Arrived at EDR: 10/19/2022
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 83

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county’s Certified Unified Program Agency database. California’s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Semi-Annually

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/22/2021
Date Data Arrived at EDR: 11/18/2021
Date Made Active in Reports: 11/22/2021
Number of Days to Update: 4

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 02/15/2022
Date Data Arrived at EDR: 02/17/2022
Date Made Active in Reports: 05/11/2022
Number of Days to Update: 83

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 10/04/2021
Date Data Arrived at EDR: 10/06/2021
Date Made Active in Reports: 12/29/2021
Number of Days to Update: 84

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/25/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 75

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/24/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 10/28/2022
Number of Days to Update: 80

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/02/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/04/2023
Number of Days to Update: 84

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/03/2023
Number of Days to Update: 83

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 08/26/2022
Date Data Arrived at EDR: 08/29/2022
Date Made Active in Reports: 11/15/2022
Number of Days to Update: 78

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 02/13/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/18/2023
Date Data Arrived at EDR: 01/19/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/18/2023
Date Data Arrived at EDR: 01/19/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/21/2022
Date Made Active in Reports: 03/16/2023
Number of Days to Update: 85

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/09/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 82

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/04/2023
Number of Days to Update: 84

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/18/2022
Date Data Arrived at EDR: 11/21/2022
Date Made Active in Reports: 02/09/2023
Number of Days to Update: 80

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 77

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/27/2021
Date Data Arrived at EDR: 03/04/2022
Date Made Active in Reports: 05/31/2022
Number of Days to Update: 88

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/22/2021
Date Data Arrived at EDR: 10/19/2021
Date Made Active in Reports: 01/13/2022
Number of Days to Update: 86

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 02/03/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/26/2023
Number of Days to Update: 78

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 04/28/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 05/03/2023
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

SAN FRANCISO COUNTY:

SAN FRANCISCO MAHER: Maher Ordinance Property Listing
a listing of properties that fall within a Maher Ordinance, for all of San Francisco

Date of Government Version: 10/11/2022
Date Data Arrived at EDR: 10/14/2022
Date Made Active in Reports: 01/04/2023
Number of Days to Update: 82

Source: San Francisco Planning
Telephone: 628-652-7483
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 02/09/2023
Date Data Arrived at EDR: 02/10/2023
Date Made Active in Reports: 05/05/2023
Number of Days to Update: 84

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/10/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/02/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 02/10/2023
Date Data Arrived at EDR: 02/10/2023
Date Made Active in Reports: 05/05/2023
Number of Days to Update: 84

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/15/2021
Date Data Arrived at EDR: 09/16/2021
Date Made Active in Reports: 12/09/2021
Number of Days to Update: 84

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 07/02/2021
Date Data Arrived at EDR: 07/06/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 8

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/28/2021
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 09/24/2021
Number of Days to Update: 86

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2022
Date Data Arrived at EDR: 02/10/2022
Date Made Active in Reports: 05/04/2022
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 08/03/2022
Date Data Arrived at EDR: 08/25/2022
Date Made Active in Reports: 11/14/2022
Number of Days to Update: 81

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 11/17/2022
Date Data Arrived at EDR: 11/21/2022
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 81

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 05/01/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 01/13/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 10/07/2022
Date Data Arrived at EDR: 10/07/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 75

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 12/27/2022
Date Data Arrived at EDR: 01/26/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 83

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/17/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 12/27/2022
Date Data Arrived at EDR: 01/26/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 83

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 04/17/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 12/19/2022
Date Data Arrived at EDR: 12/27/2022
Date Made Active in Reports: 03/17/2023
Number of Days to Update: 80

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 01/26/2023
Date Data Arrived at EDR: 01/27/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 82

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/16/2022
Date Data Arrived at EDR: 11/16/2022
Date Made Active in Reports: 02/06/2023
Number of Days to Update: 82

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/10/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 10/29/2021
Date Made Active in Reports: 01/19/2022
Number of Days to Update: 82

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/13/2022
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/06/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association’s annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics’ primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ® - PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

SAN JUAN SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CA 95045

TARGET PROPERTY COORDINATES

Latitude (North):	36.842476 - 36˚ 50’ 32.91’’
Longitude (West):	121.532848 - 121˚ 31’ 58.25’’
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	630817.4
UTM Y (Meters):	4078199.5
Elevation:	204 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	12021743 SAN JUAN BAUTISTA, CA
Version Date:	2018

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

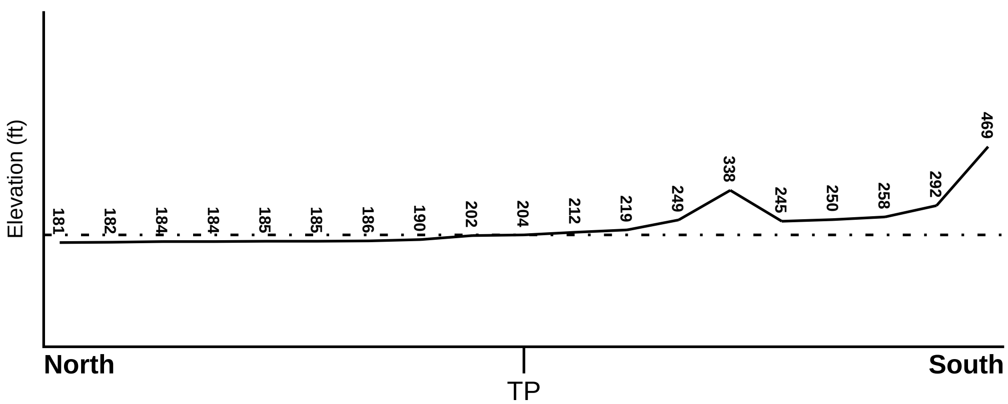
TOPOGRAPHIC INFORMATION

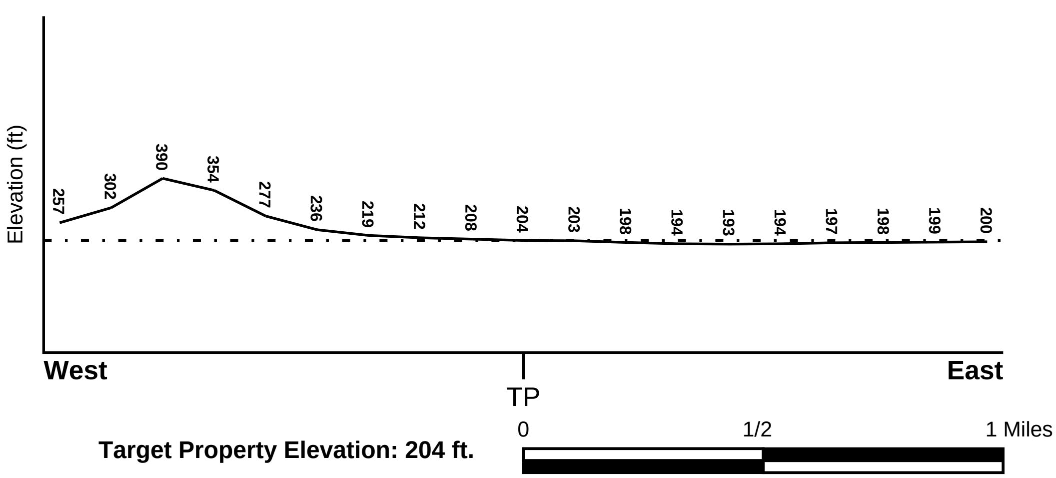
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NNE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 204 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06069C0158D	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06069C0156D	FEMA FIRM Flood data
06069C0157D	FEMA FIRM Flood data
06069C0159D	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
SAN JUAN BAUTISTA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

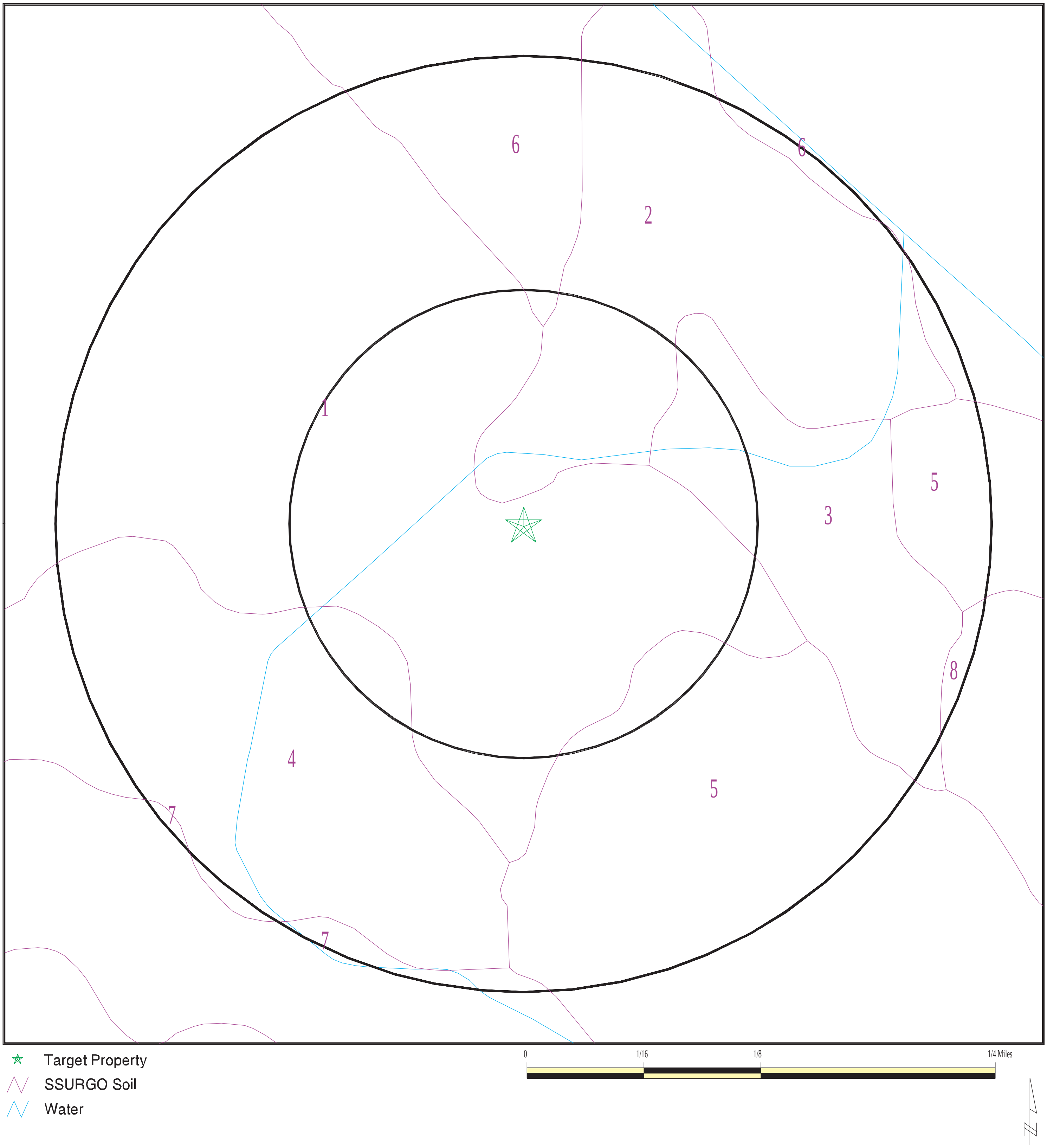
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 7330807.2s



SITE NAME: San Juan School	CLIENT: McCloskey Consultants Inc
ADDRESS: 100 Nyland Drive	CONTACT: Belinda Blackie
San Juan Bautista CA 95045	INQUIRY #: 7330807.2s
LAT/LONG: 36.842476 / 121.532848	DATE: May 08, 2023 7:43 pm

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture’s (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Rincon

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**		**Soil Reaction (pH)**
1	0 inches	22 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4 Min: 1.4	Max: 7.8 Min: 7.4
2	22 inches	44 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4 Min: 1.4	Max: 7.8 Min: 7.4
3	44 inches	79 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4 Min: 1.4	Max: 7.8 Min: 7.4

Soil Map ID: 2

Soil Component Name: Sorrento

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification			
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**	**Saturated hydraulic conductivity micro m/sec**	**Soil Reaction (pH)**
1	0 inches	18 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 7.4
2	18 inches	77 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 7.4

Soil Map ID: 3

Soil Component Name: Pacheco

Soil Surface Texture: loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 122 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 8.4 Min: 7.9
2	20 inches	59 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 8.4 Min: 7.9

Soil Map ID: 4

Soil Component Name: Sorrento

Soil Surface Texture: silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 8.4 Min: 7.4
2	18 inches	77 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 8.4 Min: 7.4

Soil Map ID: 5

Soil Component Name: Salinas

Soil Surface Texture: clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 6 Min: 1	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	25 inches	66 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 6 Min: 1	Max: 8.4 Min: 6.6

Soil Map ID: 6

Soil Component Name: Clear Lake

Soil Surface Texture: clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.4
2	11 inches	70 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.4

Soil Map ID: 7

Soil Component Name: San Benito

Soil Surface Texture: clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	33 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 1.4 Min: 0	Max: Min:
2	33 inches	53 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 1.4 Min: 0	Max: Min:
3	53 inches	57 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 1.4 Min: 0	Max: Min:

Soil Map ID: 8

Soil Component Name: Hanford

Soil Surface Texture: coarse sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification			
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**	**Saturated hydraulic conductivity micro m/sec**	**Soil Reaction (pH)**
1	0 inches	20 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 6.1
2	20 inches	25 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 6.1
3	25 inches	70 inches	sr to sandy loam to loamy coarse sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 6.1

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
12	USGS40000178461	1/8 - 1/4 Mile SSW
B14	USGS40000178463	1/4 - 1/2 Mile SE
C18	USGS40000178453	1/4 - 1/2 Mile SE
24	USGS40000178405	1/4 - 1/2 Mile SE
I40	USGS40000178592	1/2 - 1 Mile NE
H44	USGS40000178481	1/2 - 1 Mile East
L48	USGS40000178689	1/2 - 1 Mile North
L53	USGS40000178700	1/2 - 1 Mile North
M57	USGS40000178462	1/2 - 1 Mile ESE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
15	CA3500503	1/4 - 1/2 Mile NW

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

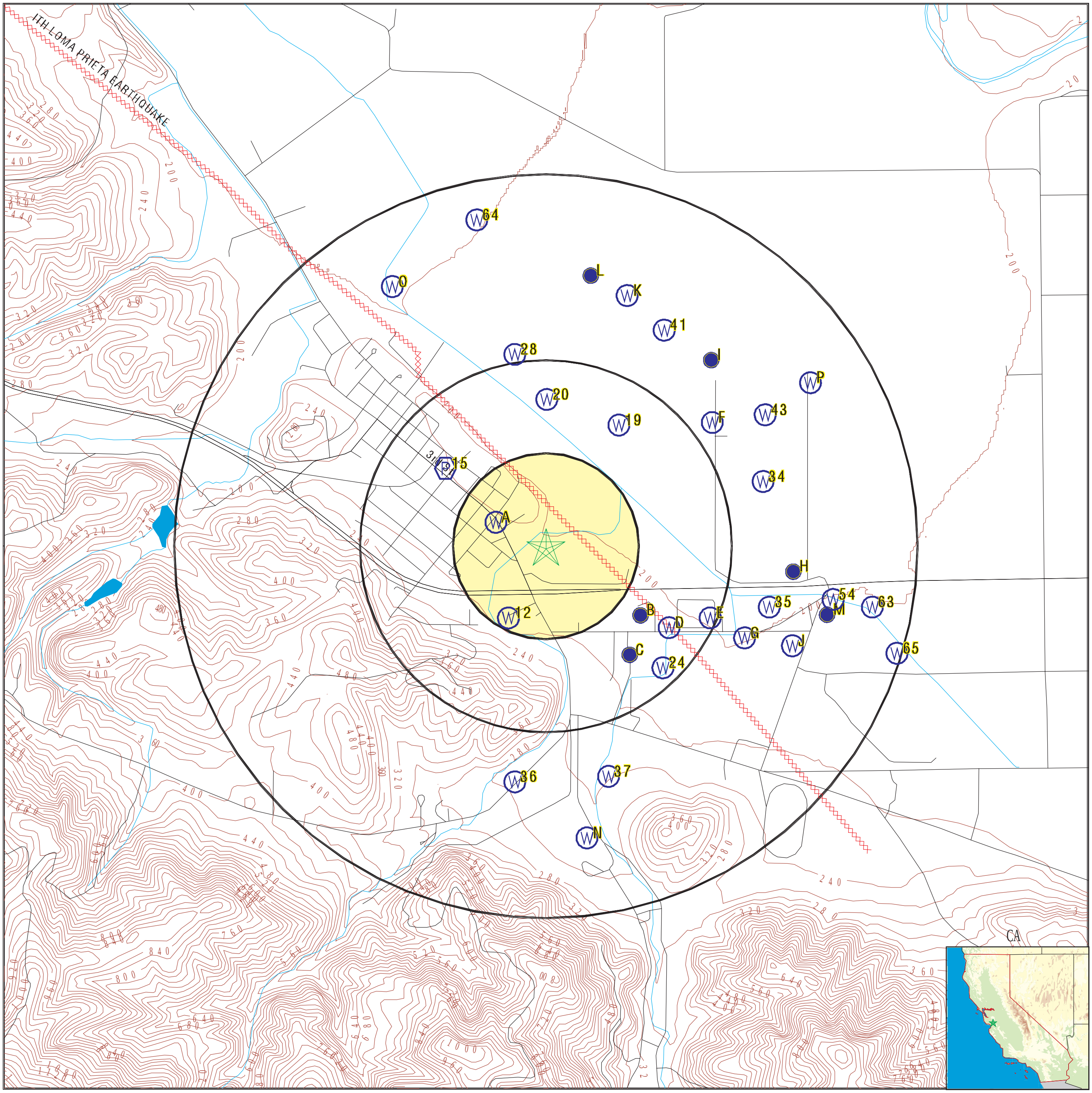
MAP ID	WELL ID	LOCATION FROM TP
A1	CAEDF0000119601	1/8 - 1/4 Mile WNW
A2	CAEDF0000090619	1/8 - 1/4 Mile WNW
A3	CAEDF0000133619	1/8 - 1/4 Mile WNW
A4	CAEDF0000057637	1/8 - 1/4 Mile WNW
A5	CAEDF0000057639	1/8 - 1/4 Mile WNW
A6	CAEDF0000136229	1/8 - 1/4 Mile NW
A7	CAEDF0000075368	1/8 - 1/4 Mile WNW
A8	CAEDF0000032503	1/8 - 1/4 Mile WNW
A9	CAEDF0000106608	1/8 - 1/4 Mile WNW
A10	CAEDF0000139262	1/8 - 1/4 Mile WNW
A11	CAEDF0000093632	1/8 - 1/4 Mile WNW
B13	CADDW0000006450	1/4 - 1/2 Mile SE
B16	CADDW0000004839	1/4 - 1/2 Mile SE
C17	CADWR9000031130	1/4 - 1/2 Mile SE
19	CAEDF0000025761	1/4 - 1/2 Mile NNE
20	CADPR0000003874	1/4 - 1/2 Mile North
D21	CAUSGSN00003753	1/4 - 1/2 Mile ESE
D22	CAUSGS000002073	1/4 - 1/2 Mile ESE
D23	CADDW0000003404	1/4 - 1/2 Mile ESE
E25	11034	1/4 - 1/2 Mile ESE
E26	18623	1/4 - 1/2 Mile ESE
E27	CADDW0000020108	1/2 - 1 Mile ESE
28	11033	1/2 - 1 Mile North
F29	CAEDF0000029289	1/2 - 1 Mile NE
F30	CAEDF0000013572	1/2 - 1 Mile NE
F31	CAEDF0000011325	1/2 - 1 Mile ENE
G32	CADDW0000011446	1/2 - 1 Mile ESE
G33	CAEDF0000031180	1/2 - 1 Mile ESE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
34	CAEDF0000005764	1/2 - 1 Mile ENE
35	CADWR0000023939	1/2 - 1 Mile ESE
36	11528	1/2 - 1 Mile South
37	CAEDF0000026594	1/2 - 1 Mile SSE
H38	CAEDF0000025028	1/2 - 1 Mile East
H39	CAEDF0000025922	1/2 - 1 Mile East
41	CAEDF0000020657	1/2 - 1 Mile NNE
I42	CAEDF0000010846	1/2 - 1 Mile NE
43	CAEDF0000028482	1/2 - 1 Mile ENE
J45	11526	1/2 - 1 Mile ESE
K46	CAEDF0000027411	1/2 - 1 Mile NNE
K47	CAEDF0000010459	1/2 - 1 Mile NNE
L49	CAEDF0000018457	1/2 - 1 Mile North
J50	CADDW0000021180	1/2 - 1 Mile ESE
M51	11035	1/2 - 1 Mile ESE
N52	CADDW0000020831	1/2 - 1 Mile South
54	CAEDF0000029755	1/2 - 1 Mile East
M55	CAEDF0000024863	1/2 - 1 Mile ESE
M56	CAEDF0000030558	1/2 - 1 Mile ESE
O58	CAEDF0000027028	1/2 - 1 Mile NNW
O59	CAEDF0000027628	1/2 - 1 Mile NNW
N60	CADWR0000001843	1/2 - 1 Mile South
P61	CAEDF0000014636	1/2 - 1 Mile ENE
P62	CAEDF0000009126	1/2 - 1 Mile ENE
63	CADWR0000012075	1/2 - 1 Mile East
64	CAEDF0000009415	1/2 - 1 Mile NNW
65	CAEDF0000013083	1/2 - 1 Mile ESE

PHYSICAL SETTING SOURCE MAP - 7330807.2s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Closest Hydrogeological Data
Oil, gas or related wells

SITE NAME:	San Juan School	CLIENT:	McCloskey Consultants Inc
ADDRESS:	100 Nyland Drive	CONTACT:	Belinda Blackie
	San Juan Bautista CA 95045	INQUIRY #:	7330807.2s
LAT/LONG:	36.842476 / 121.532848	DATE:	May 08, 2023 7:43 pm

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

A1
WNW
1/8 - 1/4 Mile
Higher | **CA WELLS** | **CAEDF0000119601**

Well ID:	T0606900024-MW-5	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-5
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-5&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-5		

A2
WNW
1/8 - 1/4 Mile
Higher | **CA WELLS** | **CAEDF0000090619**

Well ID:	T0606900024-MW-8	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-8
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-8&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-8		

A3
WNW
1/8 - 1/4 Mile
Higher | **CA WELLS** | **CAEDF0000133619**

Well ID:	T0606900024-MW-9	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-9
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-9&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-9		

A4
WNW
1/8 - 1/4 Mile
Higher | **CA WELLS** | **CAEDF0000057637**

Well ID:	T0606900024-MW-1	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-1
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-1&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-1		

Map ID Direction Distance Elevation	Database	EDR ID Number
A5 **WNW** **1/8 - 1/4 Mile** **Higher**	**CA WELLS**	**CAEDF0000057639**

Well ID:	T0606900024-MW-2	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-2
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-2&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-2		

Map ID	Database	EDR ID Number
A6 **NW** **1/8 - 1/4 Mile** **Higher**	**CA WELLS**	**CAEDF0000136229**

Well ID:	T0606900024-MW-4	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-4
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-4&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-4		

Map ID	Database	EDR ID Number
A7 **WNW** **1/8 - 1/4 Mile** **Higher**	**CA WELLS**	**CAEDF0000075368**

Well ID:	T0606900024-L-3	Well Type:	MONITORING
Source:	EDF	Other Name:	L-3
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=L-3&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=L-3		

Map ID	Database	EDR ID Number
A8 **WNW** **1/8 - 1/4 Mile** **Higher**	**CA WELLS**	**CAEDF0000032503**

Well ID:	T0606900024-MW-6	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-6
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-6&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-6		

Map ID Direction Distance Elevation		Database	EDR ID Number
A9 WNW 1/8 - 1/4 Mile Higher		**CA WELLS**	**CAEDF0000106608**

Well ID:	T0606900024-MW-7	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-7
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-7&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-7		

A10 WNW 1/8 - 1/4 Mile Higher		**CA WELLS**	**CAEDF0000139262**

Well ID:	T0606900024-MW-3	Well Type:	MONITORING
Source:	EDF	Other Name:	MW-3
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=MW-3&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=MW-3		

A11 WNW 1/8 - 1/4 Mile Higher		**CA WELLS**	**CAEDF0000093632**

Well ID:	T0606900024-L-4	Well Type:	MONITORING
Source:	EDF	Other Name:	L-4
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=T0606900024&assigned_name=L-4&store_num=		
GeoTracker Data:	https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=T0606900024&assigned_name=L-4		

12 SSW 1/8 - 1/4 Mile Higher		**FED USGS**	**USGS40000178461**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E33Q001M	Type:	Well
Description:	Not Reported	HUC:	Not Reported
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19590925
Well Depth:	140	Well Depth Units:	ft
Well Hole Depth:	200	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation		Database	EDR ID Number
B13 **SE** **1/4 - 1/2 Mile** **Higher**		**CA WELLS**	**CADDW0000006450**

Well ID:	3510002-002	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 02 - DESTROYED	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3510002-002&store_num=		
GeoTracker Data:	Not Reported		

		Database	EDR ID Number
B14 **SE** **1/4 - 1/2 Mile** **Higher**		**FED USGS**	**USGS40000178463**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E33K005M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19610706
Well Depth:	320	Well Depth Units:	ft
Well Hole Depth:	325	Well Hole Depth Units:	ft

		Database	EDR ID Number
15 **NW** **1/4 - 1/2 Mile** **Higher**		**FRDS PWS**	**CA3500503**

Epa region:	09	State:	CA
Pwsid:	CA3500503	Pwsname:	HARMONY HILLS WATER SYSTEM
Cityserved:	Not Reported	Stateserved:	CA
Zipserved:	Not Reported	Fipscounty:	06069
Status:	Closed	Retpopsrvd:	10
Pwssvcconn:	8	Psource longname:	Surface_water
Pwstype:	CWS	Owner:	Local_Govt
Contact:	JEFF CATTANEO	Contactorgname:	HARMONY HILLS WATER SYSTEM
Contactphone:	8316378218	Contactaddress1:	PO BOX 899
Contactaddress2:	30 MANSFIELD ROAD	Contactcity:	HOLLISTER
Contactstate:	CA	Contactzip:	95024
Pwsactivitycode:	N		

Pwsid:	CA3500503	Facid:	3
Facname:	SPRING 01 - CL2 TREATMENT - SURFCE INFLN		
Factype:	Treatment_plant	Facactivitycode:	A
Trtobjective:	disinfection	Trtprocess:	hypochlorination, post
Factypecode:	TP		

PWS ID:	CA3500503	PWS name:	HARMONY HILLS WATER SYSTEM
Address:	Not Reported	Care of:	Not Reported
City:	SAN JUAN BAUTISTA	State:	CA
Zip:	95045	Owner:	HARMONY HILLS WATER SYSTEM

Source code:	Ground water	Population:	65

PWS ID:	CA3500503	PWS type:	System Owner/Responsible Party
PWS name:	HARMONY HILLS MUTUAL	PWS address:	Not Reported
PWS city:	SAN JUAN BAUTISTA	PWS state:	CA
PWS zip:	95045	PWS name:	Harmony Hills Water System
PWS type code:	C	Retail population served:	70
Contact:	Jeff Cattaneo	Contact address:	PO Box 899
Contact address:	30 Mansfield Road	Contact city:	Hollister
Contact state:	CA	Contact zip:	95024
Contact telephone:	8316378218		

County:	Not Reported	Source:	Ground water
Treatment Objective:	DISINFECTION	Process:	HYPOCHLORINATION, POST
Population:	65		

PWS ID:	CA3500503	Activity status:	Active
Date system activated:	9101	Date system deactivated:	Not Reported
Retail population:	00000065	System name:	HARMONY HILLS WATER SYSTEM
System address:	HARMONY HILLS MUTUAL	System address:	6375 SAN JUAN CANYON RD
System city:	SAN JUAN BAUTISTA	System state:	CA
System zip:	95045		

Population served:	Under 101 Persons	Treatment:	Untreated

Latitude:	365044	Longitude:	1213212

Violation id:	405007	Orig code:	S
State:	CA	Violation Year:	2004
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	22	Violation name:	MCL, Monthly (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	08/01/2004
Cmp edt:	08/31/2004		

Violation id:	405024	Orig code:	S
State:	CA	Violation Year:	2004
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	05	Violation name:	Notification, State
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	07/01/2004
Cmp edt:	09/30/2004		

Violation id:	505009	Orig code:	S
State:	CA	Violation Year:	2005
Contamination code:	0999	Contamination Name:	Chlorine
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2005
Cmp edt:	03/31/2005		

Violation id:	505010	Orig code:	S
State:	CA	Violation Year:	2005
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	22	Violation name:	MCL, Monthly (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	05/01/2005
Cmp edt:	05/31/2005		

Violation id:	505012	Orig code:	S
State:	CA	Violation Year:	2005
Contamination code:	1040	Contamination Name:	Nitrate
Violation code:	03	Violation name:	Monitoring, Regular
Rule code:	331	Rule name:	Nitrates
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2005
Cmp edt:	12/31/2005		

Violation id:	505015	Orig code:	S
State:	CA	Violation Year:	2005
Contamination code:	2950	Contamination Name:	TTHM
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2005
Cmp edt:	12/31/2005		

Violation id:	505016	Orig code:	S
State:	CA	Violation Year:	2005
Contamination code:	2456	Contamination Name:	Total Haloacetic Acids (HAA5)
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2005
Cmp edt:	12/31/2005		

Violation id:	605013	Orig code:	S
State:	CA	Violation Year:	2006
Contamination code:	2950	Contamination Name:	TTHM
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2006
Cmp edt:	12/31/2006		

Violation id:	705014	Orig code:	S
State:	CA	Violation Year:	2007
Contamination code:	2456	Contamination Name:	Total Haloacetic Acids (HAA5)
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2007
Cmp edt:	12/31/2007		

Violation id:	805017	Orig code:	S
State:	CA	Violation Year:	2007
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	10/01/2007
Cmp edt:	10/31/2007		

Violation id:	805018	Orig code:	S
State:	CA	Violation Year:	2008
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	22	Violation name:	MCL, Monthly (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	06/01/2008
Cmp edt:	06/30/2008		

Violation id:	805019	Orig code:	S
State:	CA	Violation Year:	2008
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	22	Violation name:	MCL, Monthly (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	07/01/2008
Cmp edt:	07/31/2008		

Violation id:	805020	Orig code:	S
State:	CA	Violation Year:	2008
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	24	Violation name:	Monitoring, Routine Minor (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	06/01/2008
Cmp edt:	06/30/2008		

Violation id:	805021	Orig code:	S
State:	CA	Violation Year:	2008
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	24	Violation name:	Monitoring, Routine Minor (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	07/01/2008
Cmp edt:	07/31/2008		

Violation id:	805022	Orig code:	S
State:	CA	Violation Year:	2008
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	08/01/2008
Cmp edt:	08/31/2008		

Violation id:	805023	Orig code:	S
State:	CA	Violation Year:	2008
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	24	Violation name:	Monitoring, Routine Minor (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	08/01/2008
Cmp edt:	08/31/2008		

Violation id:	9305011	Orig code:	S
State:	CA	Violation Year:	1992
Contamination code:	0200	Contamination Name:	SWTR
Violation code:	42	Violation name:	Failure to Filter (SWTR)
Rule code:	121	Rule name:	SWTR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	09/01/1992
Cmp edt:	Not Reported		

Violation id:	95V0001	Orig code:	F
State:	CA	Violation Year:	1993
Contamination code:	5000	Contamination Name:	Lead and Copper Rule
Violation code:	51	Violation name:	Initial Tap Sampling for Pb and Cu
Rule code:	350	Rule name:	LCR
Violation measur:	0	Unit of measure:	Not Reported
State mcl:	0	Cmp bdt:	07/01/1993
Cmp edt:	Not Reported		

Violation ID: 305026 Orig Code: S
Enforcemnt FY: 2004 Enforcement Action: 07/21/2004
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 405007 Orig Code: S
Enforcemnt FY: 2005 Enforcement Action: 01/18/2005
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 405007 Orig Code: S
Enforcemnt FY: 2005 Enforcement Action: 10/08/2004
Enforcement Detail: St Boil Water Order Enforcement Category: Informal

Violation ID: 405024 Orig Code: S
Enforcemnt FY: 2005 Enforcement Action: 10/08/2004
Enforcement Detail: St Boil Water Order Enforcement Category: Informal

Violation ID: 405024 Orig Code: S
Enforcemnt FY: 2005 Enforcement Action: 01/18/2005
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505009 Orig Code: S
Enforcemnt FY: 2005 Enforcement Action: 06/27/2005
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505010 Orig Code: S
Enforcemnt FY: 2005 Enforcement Action: 07/08/2005
Enforcement Detail: St Boil Water Order Enforcement Category: Informal

Violation ID: 505012 Orig Code: S
Enforcemnt FY: 2006 Enforcement Action: 06/16/2006
Enforcement Detail: St Violation/Reminder Notice
Enforcement Category: Informal

Violation ID: 505012 Orig Code: S
Enforcemnt FY: 2006 Enforcement Action: 06/16/2006
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505015 Orig Code: S
Enforcemnt FY: 2007 Enforcement Action: 06/13/2007
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505015 Orig Code: S
Enforcemnt FY: 2007 Enforcement Action: 06/18/2007
Enforcement Detail: St Violation/Reminder Notice
Enforcement Category: Informal

Violation ID: 505015 Orig Code: S
Enforcemnt FY: 2007 Enforcement Action: 09/18/2007
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505016 Orig Code: S
Enforcemnt FY: 2007 Enforcement Action: 06/13/2007
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505016 Orig Code: S
Enforcemnt FY: 2007 Enforcement Action: 09/18/2007
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 505016 Orig Code: S
Enforcemnt FY: 2007 Enforcement Action: 06/18/2007
Enforcement Detail: St Violation/Reminder Notice
Enforcement Category: Informal

Violation ID:	605013	Orig Code:	S
Enforcemnt FY:	2007	Enforcement Action:	06/13/2007
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	605013	Orig Code:	S
Enforcemnt FY:	2007	Enforcement Action:	06/18/2007
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		

Violation ID:	705014	Orig Code:	S
Enforcemnt FY:	2007	Enforcement Action:	06/13/2007
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	705014	Orig Code:	S
Enforcemnt FY:	2007	Enforcement Action:	06/18/2007
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		

Violation ID:	805017	Orig Code:	S
Enforcemnt FY:	2008	Enforcement Action:	12/05/2007
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		

Violation ID:	805018	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	10/14/2008
Enforcement Detail:	St Boil Water Order	Enforcement Category:	Informal

Violation ID:	805019	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	10/14/2008
Enforcement Detail:	St Boil Water Order	Enforcement Category:	Informal

Violation ID:	805020	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	10/14/2008
Enforcement Detail:	St Boil Water Order	Enforcement Category:	Informal

Violation ID:	805021	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	10/14/2008
Enforcement Detail:	St Boil Water Order	Enforcement Category:	Informal

Violation ID:	805022	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	10/14/2008
Enforcement Detail:	St Boil Water Order	Enforcement Category:	Informal

Violation ID:	805023	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	10/14/2008
Enforcement Detail:	St Boil Water Order	Enforcement Category:	Informal

Violation ID:	9205025	Orig Code:	S
Enforcemnt FY:	2004	Enforcement Action:	07/21/2004
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	9205027	Orig Code:	S
Enforcemnt FY:	2004	Enforcement Action:	07/21/2004
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	9305028	Orig Code:	S
Enforcemnt FY:	2004	Enforcement Action:	07/21/2004
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	95V0001	Orig Code:	F
Enforcemnt FY:	2005	Enforcement Action:	09/30/2005
Enforcement Detail:	Fed Compliance achieved	Enforcement Category:	Resolving

Violation ID:	9805004	Orig Code:	S
Enforcemnt FY:	2002	Enforcement Action:	02/06/2002
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	9805005	Orig Code:	S
Enforcemnt FY:	2002	Enforcement Action:	02/06/2002
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0405007	Contaminant:	COLIFORM (TCR)
Violation type:	Max Contaminant Level, Monthly (TCR)		
Compliance start date:	8/1/2004 0:00:00	Compliance end date:	8/31/2004 0:00:00
Enforcement date:	10/8/2004 0:00:00	Enforcement action:	State Boil Water Order
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0405007	Contaminant:	COLIFORM (TCR)
Violation type:	Max Contaminant Level, Monthly (TCR)		
Compliance start date:	8/1/2004 0:00:00	Compliance end date:	8/31/2004 0:00:00
Enforcement date:	10/8/2004 0:00:00	Enforcement action:	State Compliance Achieved
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505009	Contaminant:	0999
Violation type:	27	Compliance start date:	1/1/2005 0:00:00
Compliance end date:	3/31/2005 0:00:00	Enforcement date:	6/21/2005 0:00:00
Enforcement action:	State Compliance Achieved	Violation measurement:	Not Reported

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505010	Contaminant:	COLIFORM (TCR)
Violation type:	Max Contaminant Level, Monthly (TCR)		
Compliance start date:	5/1/2005 0:00:00	Compliance end date:	5/31/2005 0:00:00
Enforcement date:	7/8/2005 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505010	Contaminant:	COLIFORM (TCR)
Violation type:	Max Contaminant Level, Monthly (TCR)		
Compliance start date:	5/1/2005 0:00:00	Compliance end date:	5/31/2005 0:00:00
Enforcement date:	7/8/2005 0:00:00	Enforcement action:	State Compliance Achieved
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505012	Contaminant:	NITRATE
Violation type:	3	Compliance start date:	1/1/2005 0:00:00
Compliance end date:	12/31/2005 0:00:00	Enforcement date:	6/16/2006 0:00:00
Enforcement action:	State Violation/Reminder Notice		
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505012	Contaminant:	NITRATE
Violation type:	3	Compliance start date:	1/1/2005 0:00:00
Compliance end date:	12/31/2005 0:00:00	Enforcement date:	6/16/2006 0:00:00
Enforcement action:	State Compliance Achieved	Violation measurement:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505015	Contaminant:	TTHM
Violation type:	27	Compliance start date:	1/1/2005 0:00:00
Compliance end date:	12/31/2005 0:00:00	Enforcement date:	4/3/2006 0:00:00
Enforcement action:	State Compliance Achieved	Violation measurement:	Not Reported

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0505016	Contaminant:	2456
Violation type:	27	Compliance start date:	1/1/2005 0:00:00
Compliance end date:	12/31/2005 0:00:00	Enforcement date:	4/3/2006 0:00:00
Enforcement action:	State Compliance Achieved	Violation measurement:	Not Reported

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0605013	Contaminant:	TTHM
Violation type:	27	Compliance start date:	1/1/2006 0:00:00
Compliance end date:	12/31/2006 0:00:00	Enforcement date:	6/18/2007 0:00:00
Enforcement action:	State Violation/Reminder Notice		
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0605013	Contaminant:	TTHM
Violation type:	27	Compliance start date:	1/1/2006 0:00:00
Compliance end date:	12/31/2006 0:00:00	Enforcement date:	6/18/2007 0:00:00
Enforcement action:	State Compliance Achieved	Violation measurement:	Not Reported

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0705014	Contaminant:	2456
Violation type:	27	Compliance start date:	1/1/2007 0:00:00
Compliance end date:	12/31/2007 0:00:00	Enforcement date:	6/18/2007 0:00:00
Enforcement action:	State Violation/Reminder Notice		
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0705014	Contaminant:	2456
Violation type:	27	Compliance start date:	1/1/2007 0:00:00
Compliance end date:	12/31/2007 0:00:00	Enforcement date:	6/18/2007 0:00:00
Enforcement action:	State Compliance Achieved	Violation measurement:	Not Reported

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805017	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	10/1/2007 0:00:00	Compliance end date:	10/31/2007 0:00:00
Enforcement date:	12/5/2007 0:00:00	Enforcement action:	State Violation/Reminder Notice
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805017	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	10/1/2007 0:00:00	Compliance end date:	10/31/2007 0:00:00
Enforcement date:	12/5/2007 0:00:00	Enforcement action:	State Compliance Achieved
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C

Violation ID:	0805018	Contaminant:	COLIFORM (TCR)
Violation type:	Max Contaminant Level, Monthly (TCR)		
Compliance start date:	6/1/2008 0:00:00	Compliance end date:	6/30/2008 0:00:00
Enforcement date:	10/14/2008 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805019	Contaminant:	COLIFORM (TCR)
Violation type:	Max Contaminant Level, Monthly (TCR)		
Compliance start date:	7/1/2008 0:00:00	Compliance end date:	7/31/2008 0:00:00
Enforcement date:	10/14/2008 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805020	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Minor (TCR)		
Compliance start date:	6/1/2008 0:00:00	Compliance end date:	6/30/2008 0:00:00
Enforcement date:	10/14/2008 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805021	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Minor (TCR)		
Compliance start date:	7/1/2008 0:00:00	Compliance end date:	7/31/2008 0:00:00
Enforcement date:	10/14/2008 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805022	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	8/1/2008 0:00:00	Compliance end date:	8/31/2008 0:00:00
Enforcement date:	10/14/2008 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	0805023	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Minor (TCR)		
Compliance start date:	8/1/2008 0:00:00	Compliance end date:	8/31/2008 0:00:00
Enforcement date:	10/14/2008 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	9305003	Contaminant:	SWTR
Violation type:	Treatment Technique (SWTR)		
Compliance start date:	6/29/1993 0:00:00	Compliance end date:	12/31/2025 0:00:00
Enforcement date:	12/8/1993 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	9305011	Contaminant:	SWTR
Violation type:	Treatment Technique (SWTR)		
Compliance start date:	1/1/1993 0:00:00	Compliance end date:	12/31/2025 0:00:00
Enforcement date:	12/8/1993 0:00:00	Enforcement action:	State AO (w/o Penalty) Issued
Violation measurement:	Not Reported		

PWS name:	Harmony Hills Water System		
Population served:	70	PWS type code:	C
Violation ID:	95V0001	Contaminant:	LEAD & COPPER RULE
Violation type:	Initial Tap Sampling for Pb and Cu		
Compliance start date:	7/1/1993 0:00:00	Compliance end date:	9/30/2005 0:00:00
Enforcement date:	9/30/2005 0:00:00	Enforcement action:	Fed Compliance Achieved
Violation measurement:	0		

B16
SE
1/4 - 1/2 Mile
Higher

CA WELLS **CADDW0000004839**

Well ID:	3510002-009	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 05 - RAW	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3510002-009&store_num=		
GeoTracker Data:	Not Reported		

C17
SE
1/4 - 1/2 Mile
Higher

CA WELLS **CADWR9000031130**

State Well #:	13S04E04A003M	Station ID:	46174
Well Name:	3267	Basin Name:	North San Benito
Well Use:	Irrigation	Well Type:	Single Well
Well Depth:	195	Well Completion Rpt #:	Not Reported

C18
SE
1/4 - 1/2 Mile
Higher

FED USGS **USGS40000178453**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S004E04A003M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19470904
Well Depth:	195	Well Depth Units:	ft
Well Hole Depth:	195	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements: 48

Level reading date:	1988-10	Feet below surface:	20.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-03	Feet below surface:	17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-10	Feet below surface:	21
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1987-03	Feet below surface:	17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-10	Feet below surface:	17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-03-01	Feet below surface:	13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-03	Feet below surface:	13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-10-01	Feet below surface:	16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-03-01	Feet below surface:	15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-01	Feet below surface:	14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-03-01	Feet below surface:	10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03	Feet below surface:	8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-10	Feet below surface:	13.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-03	Feet below surface:	11.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-10	Feet below surface:	18.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03	Feet below surface:	14.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-10	Feet below surface:	14.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-03-12	Feet below surface:	15.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10	Feet below surface:	20.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-03	Feet below surface:	16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10	Feet below surface:	25.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-03	Feet below surface:	28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10	Feet below surface:	33.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-06	Feet below surface:	31
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1977-03	Feet below surface:	26
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-10	Feet below surface:	27.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-03	Feet below surface:	16.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10	Feet below surface:	15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-03	Feet below surface:	18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-03	Feet below surface:	25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-10	Feet below surface:	35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-03	Feet below surface:	23
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-03	Feet below surface:	16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-03	Feet below surface:	13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-03	Feet below surface:	28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-02-07	Feet below surface:	37.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-03-01	Feet below surface:	62.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-04-07	Feet below surface:	55.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-03	Feet below surface:	58.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04	Feet below surface:	55.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-03	Feet below surface:	52.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-04	Feet below surface:	44
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-03	Feet below surface:	20.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-02-16	Feet below surface:	22.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-03-21	Feet below surface:	5.6
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1951-11-06	Feet below surface:	33.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-04-10	Feet below surface:	39.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-03-26	Feet below surface:	46.6
Feet to sea level:	Not Reported	Note:	Not Reported

19
NNE
1/4 - 1/2 Mile
Lower

CA WELLS CAEDF0000025761

Well ID:	AGL020014986-AG_WELL_FL	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	AG_WELL_FL
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020014986&assigned_name=AG_WELL_FL&store_num=		
GeoTracker Data:	Not Reported		

20
North
1/4 - 1/2 Mile
Lower

CA WELLS CADPR0000003874

Well ID:	87613	Well Type:	UNK
Source:	Department of Pesticide Regulation		
Other Name:	87613	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DPR&samp_date=&global_id=&assigned_name=87613&store_num=		
GeoTracker Data:	Not Reported		

D21
ESE
1/4 - 1/2 Mile
Lower

CA WELLS CAUSGSN00003753

Well ID:	USGS-365000121310001	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-365000121310001	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-365000121310001&store_num=		
GeoTracker Data:	Not Reported		

D22
ESE
1/4 - 1/2 Mile
Lower

CA WELLS CAUSGS000002073

Map ID Direction Distance Elevation	Database	EDR ID Number
D23 **ESE** **1/4 - 1/2 Mile** **Lower**	**CA WELLS**	**CADDW0000003404**

Well ID:	3500556-001	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 01 - RAW	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3500556-001&store_num=		
GeoTracker Data:	Not Reported		

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24 **SE** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40000178405**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S004E04A005M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19660429
Well Depth:	320	Well Depth Units:	ft
Well Hole Depth:	320	Well Hole Depth Units:	ft

E25 **ESE** **1/4 - 1/2 Mile** **Lower**	**CA WELLS**	**11034**

Seq:	11034	Prim sta c:	12S/04E-34N03 M
Frds no:	3500556001	County:	35
District:	05	User id:	HEN
System no:	3500556	Water type:	G
Source nam:	WELL 01	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	365023.0	Longitude:	1213127.0
Precision:	3	Status:	AR
Comment 1:	400 SAN JUAN - HOLLISTER RD., SAN JUAN BAUTISTA. WELL IN W SIDE OF		
Comment 2:	PARK, ~ 50’ FROM RD	Comment 3:	Not Reported
Comment 4:	Not Reported	Comment 5:	Not Reported
Comment 6:	Not Reported	Comment 7:	Not Reported

System no:	3500556	System nam:	Mission Farms R.V. Park
Hqname:	Not Reported	Address:	400 SAN JUAN HOLLISTER RD
City:	SAN JUAN BAUTISTA	State:	CA
Zip:	95045	Zip ext:	Not Reported
Pop serv:	75	Connection:	169
Area serve:	Not Reported		

Sample date:	07-DEC-17	Finding:	0.94
Chemical:	RADIUM 228 MDA95	Report units:	PCI/L
Dlr:	0.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	07-DEC-17	Finding:	0.47
Chemical:	RADIUM 226 MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	05-OCT-17	Finding:	1.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-OCT-17	Finding:	29.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	05-OCT-17	Finding:	220.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	19-JUL-17	Finding:	3.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-JUN-17	Finding:	1.2
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-APR-17	Finding:	97.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	1.4
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-APR-17	Finding:	12.35
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	05-APR-17	Finding:	0.84
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	05-APR-17	Finding:	560.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	23.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	05-APR-17	Finding:	190.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	05-APR-17	Finding:	0.64
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	05-APR-17	Finding:	55.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	05-APR-17	Finding:	61.
Chemical:	CHLORIDE	Report units:	MG/L

Dlr:	0.		
Sample date:	05-APR-17	Finding:	1.6
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	46.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	20.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	327.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	910.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	05-APR-17	Finding:	7.47
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	05-APR-17	Finding:	310.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	380.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	05-APR-17	Finding:	1.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JAN-17	Finding:	62.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	25-JAN-17	Finding:	590.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	25-JAN-17	Finding:	1.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-OCT-16	Finding:	3.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JUL-16	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JUL-16	Finding:	1.52
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		

Sample date:	14-JUL-16	Finding:	1.44
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	14-APR-16	Finding:	3.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JAN-16	Finding:	31.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	21-JAN-16	Finding:	210.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	21-JAN-16	Finding:	2.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUL-15	Finding:	310.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	15-JUL-15	Finding:	21.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	30-DEC-14	Finding:	270.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	0.2
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	30-DEC-14	Finding:	8.2
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	30-DEC-14	Finding:	1.4
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	43.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	9.7
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	18.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	85.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	95.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L

Dlr:	0.		
Sample date:	30-DEC-14	Finding:	78.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	7.49
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	380.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	8.5
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-DEC-14	Finding:	0.11
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	30-DEC-14	Finding:	11.03
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	30-DEC-14	Finding:	1900.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-DEC-14	Finding:	62.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	23-DEC-14	Finding:	160.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	22-OCT-14	Finding:	5.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-OCT-14	Finding:	211.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	15-JUL-14	Finding:	5.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-JUL-14	Finding:	83.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	15-APR-14	Finding:	4.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-OCT-13	Finding:	29.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		

Sample date:	29-OCT-13	Finding:	107.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	29-OCT-13	Finding:	4.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-JUL-13	Finding:	4.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-APR-13	Finding:	201.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	24-APR-13	Finding:	4.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-APR-13	Finding:	433.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	26-APR-12	Finding:	123.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	13-FEB-12	Finding:	33.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	13-FEB-12	Finding:	176.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	23-JAN-12	Finding:	6.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-JAN-12	Finding:	153.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		

E26
ESE
1/4 - 1/2 Mile
Lower

CA WELLS 18623

Seq:	18623	Prim sta c:	3500556-002
Frds no:	3500556002	County:	35
District:	05	User id:	HEN
System no:	3500556	Water type:	G
Source nam:	S.J. BAUTISTA CONN	Station ty:	WELL/AMBNT
Latitude:	365023.0	Longitude:	1213127.0
Precision:	3	Status:	AU
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3500556	System nam:	Mission Farms R.V. Park
Hqname:	Not Reported	Address:	400 SAN JUAN HOLLISTER RD
City:	SAN JUAN BAUTISTA	State:	CA
Zip:	95045	Zip ext:	Not Reported
Pop serv:	75	Connection:	169
Area serve:	Not Reported		

E27
ESE
1/2 - 1 Mile
Lower

CA WELLS CADDW0000020108

Well ID:	3500556-002	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	S.J. BAUTISTA CONN - PURCHASED		
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3500556-002&store_num=		
GeoTracker Data:	Not Reported		

28
North
1/2 - 1 Mile
Lower

CA WELLS 11033

Seq:	11033	Prim sta c:	12S/04E-33R05 M
Frds no:	3510002001	County:	35
District:	05	User id:	HEN
System no:	3510002	Water type:	G
Source nam:	WELL 01	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	365100.0	Longitude:	1213200.0
Precision:	8	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3510002	System nam:	City Of San Juan Bautista
Hqname:	Not Reported	Address:	P O BOX 1086
City:	SN JUAN BAUTISTA	State:	ca
Zip:	95045	Zip ext:	Not Reported
Pop serv:	1655	Connection:	620
Area serve:	SAN JUAN BAUTISTA		

Sample date:	07-FEB-18	Finding:	4.25
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	09-FEB-17	Finding:	0.11
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		

Sample date:	09-FEB-17	Finding:	730.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		

Sample date:	09-FEB-17	Finding:	30.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		

Sample date:	09-FEB-17	Finding:	0.56
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	09-FEB-17	Finding:	110.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	09-FEB-17	Finding:	100.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	1.3
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	65.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	28.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	150.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	485.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	1.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-FEB-17	Finding:	410.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	340.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	7.46
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	980.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	1.4
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-FEB-17	Finding:	12.55
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	10-FEB-16	Finding:	1000.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US

Dlr: 0.

Sample date: 10-FEB-16 Finding: 1.84
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 05-JAN-16 Finding: 2.11
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 07-APR-15 Finding: 9.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 04-FEB-15 Finding: 9.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 13-FEB-14 Finding: 2100.
Chemical: NITRATE + NITRITE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 13-FEB-14 Finding: 0.46
Chemical: FLUORIDE (F) (NATURAL-SOURCE) Report units: MG/L
Dlr: 0.1

Sample date: 13-FEB-14 Finding: 12.38
Chemical: AGGRSSIVE INDEX (CORROSIVITY) Report units: Not Reported
Dlr: 0.

Sample date: 13-FEB-14 Finding: 620.
Chemical: TOTAL DISSOLVED SOLIDS Report units: MG/L
Dlr: 0.

Sample date: 13-FEB-14 Finding: 80.
Chemical: SULFATE Report units: MG/L
Dlr: 0.5

Sample date: 13-FEB-14 Finding: 75.
Chemical: CHLORIDE Report units: MG/L
Dlr: 0.

Sample date: 13-FEB-14 Finding: 1.1
Chemical: POTASSIUM Report units: MG/L
Dlr: 0.

Sample date: 13-FEB-14 Finding: 49.
Chemical: SODIUM Report units: MG/L
Dlr: 0.

Sample date: 13-FEB-14 Finding: 20.
Chemical: MAGNESIUM Report units: MG/L
Dlr: 0.

Sample date: 13-FEB-14 Finding: 110.
Chemical: CALCIUM Report units: MG/L
Dlr: 0.

Sample date: 13-FEB-14 Finding: 353.
Chemical: HARDNESS (TOTAL) AS CACO3 Report units: MG/L
Dlr: 0.

Sample date:	13-FEB-14	Finding:	350.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	280.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	7.49
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	920.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	9.1
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-JUL-13	Finding:	0.6
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	02-JUL-13	Finding:	6.
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	02-JUL-13	Finding:	1.1
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	14-FEB-13	Finding:	950.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	14-FEB-13	Finding:	8.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	05-JUL-12	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-JUN-12	Finding:	9.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

F29
NE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000029289**

Well ID:	AGL020027854-71853	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71853
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020027854&assigned_name=71853&store_num=		
GeoTracker Data:	Not Reported		

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

F30
NE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000013572**

Well ID:	AGL020001023-NISHI-DM	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	NISHI-DM
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020001023&assigned_name=NISHI-DM&store_num=		
GeoTracker Data:	Not Reported		

F31
ENE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000011325**

Well ID:	CCDW147	Well Type:	DOMESTIC
Source:	Local Groundwater Projects		
Other Name:	CCDW147	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=LOCALGW&samp_date=&global_id=&assigned_name=CCDW147&store_num=		
GeoTracker Data:	Not Reported		

G32
ESE
1/2 - 1 Mile
Lower

CA WELLS **CADDW0000011446**

Well ID:	3510002-010	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 06 - RAW	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3510002-010&store_num=		
GeoTracker Data:	Not Reported		

G33
ESE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000031180**

Well ID:	AGL020015864-WELL	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	WELL
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020015864&assigned_name=WELL&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
34 **ENE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CAEDF0000005764**

Well ID:	AGL020027854-71854	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71854
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020027854&assigned_name=71854&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
35 **ESE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CADWR0000023939**

Well ID:	12S04E34P002M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	12S04E34P002M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=12S04E34P002M&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
36 **South** **1/2 - 1 Mile** **Higher**	**CA WELLS**	**11528**

Seq:	11528	Prim sta c:	13S/04E-04J05 M
Frds no:	3510002002	County:	35
District:	05	User id:	HEN
System no:	3510002	Water type:	G
Source nam:	WELL 02	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	365000.0	Longitude:	1213200.0
Precision:	8	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3510002	System nam:	City Of San Juan Bautista
Hqname:	Not Reported	Address:	P O BOX 1086
City:	SN JUAN BAUTISTA	State:	ca
Zip:	95045	Zip ext:	Not Reported
Pop serv:	1655	Connection:	620
Area serve:	SAN JUAN BAUTISTA		

Sample date:	21-MAR-18	Finding:	3.32
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	14-MAR-18	Finding:	3.96
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	07-MAR-18	Finding:	7.32
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-FEB-18	Finding:	8.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-FEB-18	Finding:	9.16
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-FEB-18	Finding:	8.11
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-FEB-18	Finding:	5.28
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-JAN-18	Finding:	8.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-JAN-18	Finding:	7.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-JAN-18	Finding:	6.47
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-JAN-18	Finding:	7.08
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-JAN-18	Finding:	7.77
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-DEC-17	Finding:	8.49
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-DEC-17	Finding:	9.73
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-DEC-17	Finding:	8.23
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-DEC-17	Finding:	7.14
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-NOV-17	Finding:	8.44
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-NOV-17	Finding:	8.58
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	16-NOV-17	Finding:	8.82
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-NOV-17	Finding:	11.18
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-NOV-17	Finding:	13.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-OCT-17	Finding:	12.23
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-OCT-17	Finding:	9.83
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-OCT-17	Finding:	10.94
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-OCT-17	Finding:	11.58
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-SEP-17	Finding:	12.94
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-SEP-17	Finding:	13.61
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-SEP-17	Finding:	13.44
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-SEP-17	Finding:	12.79
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-SEP-17	Finding:	13.81
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-SEP-17	Finding:	13.45
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-SEP-17	Finding:	13.2
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-AUG-17	Finding:	13.53
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	25-AUG-17	Finding:	13.57
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-AUG-17	Finding:	12.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-AUG-17	Finding:	13.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-AUG-17	Finding:	13.73
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-AUG-17	Finding:	13.77
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-AUG-17	Finding:	13.42
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-AUG-17	Finding:	13.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-AUG-17	Finding:	11.99
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-AUG-17	Finding:	13.86
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-AUG-17	Finding:	13.58
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-AUG-17	Finding:	13.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-AUG-17	Finding:	13.49
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-JUL-17	Finding:	13.04
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-JUL-17	Finding:	13.11
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JUL-17	Finding:	12.61
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JUL-17	Finding:	13.86
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr: 0.4

Sample date:	20-JUL-17	Finding:	13.45
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JUL-17	Finding:	13.98
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-JUL-17	Finding:	13.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-JUL-17	Finding:	14.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-JUL-17	Finding:	14.05
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-JUL-17	Finding:	13.81
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-JUL-17	Finding:	14.85
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-JUL-17	Finding:	14.41
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-JUL-17	Finding:	13.88
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-JUL-17	Finding:	12.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-JUL-17	Finding:	14.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-JUL-17	Finding:	14.38
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-JUN-17	Finding:	13.45
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-JUN-17	Finding:	14.21
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JUN-17	Finding:	13.86
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	24-JUN-17	Finding:	13.39
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-JUN-17	Finding:	14.59
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JUN-17	Finding:	13.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JUN-17	Finding:	11.88
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-JUN-17	Finding:	11.64
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JUN-17	Finding:	7.53
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JUN-17	Finding:	9.04
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-JUN-17	Finding:	7.46
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUN-17	Finding:	7.12
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JUN-17	Finding:	3.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-JUN-17	Finding:	6.93
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-JUN-17	Finding:	5.05
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-JUN-17	Finding:	4.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-JUN-17	Finding:	4.64
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-MAY-17	Finding:	4.14
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-MAY-17	Finding:	3.58
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	26-MAY-17	Finding:	4.71
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-MAY-17	Finding:	4.14
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-MAY-17	Finding:	3.57
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-MAY-17	Finding:	3.31
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-MAY-17	Finding:	4.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-MAY-17	Finding:	4.87
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-MAY-17	Finding:	4.39
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-MAY-17	Finding:	4.24
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-MAY-17	Finding:	3.64
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-MAY-17	Finding:	3.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-MAY-17	Finding:	4.38
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-MAY-17	Finding:	3.98
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-MAY-17	Finding:	3.41
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-MAY-17	Finding:	4.23
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-MAY-17	Finding:	4.48
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	04-MAY-17	Finding:	3.98
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-APR-17	Finding:	2.39
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-APR-17	Finding:	3.48
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-APR-17	Finding:	3.08
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-APR-17	Finding:	3.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-APR-17	Finding:	4.19
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-APR-17	Finding:	3.63
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-MAR-17	Finding:	3.19
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-MAR-17	Finding:	3.48
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-MAR-17	Finding:	3.84
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-MAR-17	Finding:	2.95
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-MAR-17	Finding:	3.2
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-MAR-17	Finding:	3.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-FEB-17	Finding:	4.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-FEB-17	Finding:	4.44
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-FEB-17	Finding:	2.49
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr: 0.4

Sample date:	16-FEB-17	Finding:	4.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-FEB-17	Finding:	3.52
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-FEB-17	Finding:	3.77
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-FEB-17	Finding:	3.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-FEB-17	Finding:	160.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	31.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	68.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	1.9
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	110.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	09-FEB-17	Finding:	0.53
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	09-FEB-17	Finding:	660.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	0.19
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	09-FEB-17	Finding:	12.8
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	2.9
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-FEB-17	Finding:	524.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		

Sample date:	09-FEB-17	Finding:	2.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-FEB-17	Finding:	440.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	360.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	7.65
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	1100.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	09-FEB-17	Finding:	2.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-FEB-17	Finding:	130.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	02-FEB-17	Finding:	4.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-FEB-17	Finding:	3.91
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-JAN-17	Finding:	4.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-JAN-17	Finding:	4.54
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JAN-17	Finding:	3.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-JAN-17	Finding:	4.56
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JAN-17	Finding:	4.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-JAN-17	Finding:	3.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-JAN-17	Finding:	4.44
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	12-JAN-17	Finding:	4.56
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-JAN-17	Finding:	4.18
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-JAN-17	Finding:	3.71
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-JAN-17	Finding:	3.96
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-JAN-17	Finding:	3.45
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-DEC-16	Finding:	4.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-DEC-16	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-DEC-16	Finding:	2.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-DEC-16	Finding:	4.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-DEC-16	Finding:	4.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-DEC-16	Finding:	3.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-DEC-16	Finding:	5.1
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-DEC-16	Finding:	4.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-DEC-16	Finding:	4.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-DEC-16	Finding:	3.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	08-DEC-16	Finding:	4.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-DEC-16	Finding:	4.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-DEC-16	Finding:	4.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-DEC-16	Finding:	3.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-DEC-16	Finding:	4.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-DEC-16	Finding:	4.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-NOV-16	Finding:	3.86
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-NOV-16	Finding:	4.67
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-NOV-16	Finding:	4.49
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-NOV-16	Finding:	4.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-NOV-16	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-NOV-16	Finding:	4.43
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-NOV-16	Finding:	3.39
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-NOV-16	Finding:	5.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-NOV-16	Finding:	4.76
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-NOV-16	Finding:	3.35
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr: 0.4

Sample date:	03-NOV-16	Finding:	4.64
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-NOV-16	Finding:	4.17
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-NOV-16	Finding:	3.33
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-OCT-16	Finding:	4.2
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-OCT-16	Finding:	4.07
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-OCT-16	Finding:	3.67
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-OCT-16	Finding:	4.26
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-OCT-16	Finding:	3.92
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-OCT-16	Finding:	3.21
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-OCT-16	Finding:	4.32
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-OCT-16	Finding:	3.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-OCT-16	Finding:	3.25
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-OCT-16	Finding:	4.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-OCT-16	Finding:	4.64
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-OCT-16	Finding:	4.24
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date: 10-OCT-16 Finding: 3.76
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 06-OCT-16 Finding: 4.57
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 06-OCT-16 Finding: 4.65
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 05-OCT-16 Finding: 4.13
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 04-OCT-16 Finding: 3.63
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 30-SEP-16 Finding: 4.89
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 30-SEP-16 Finding: 4.96
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 29-SEP-16 Finding: 4.78
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 28-SEP-16 Finding: 4.68
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 27-SEP-16 Finding: 4.25
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 26-SEP-16 Finding: 3.82
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 23-SEP-16 Finding: 4.28
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 23-SEP-16 Finding: 4.72
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 22-SEP-16 Finding: 3.62
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 20-SEP-16 Finding: 4.99
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 19-SEP-16 Finding: 4.93
Chemical: NITRATE (AS N) Report units: MG/L

Dlr: 0.4

Sample date: 18-SEP-16 Finding: 4.88
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 17-SEP-16 Finding: 4.75
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 16-SEP-16 Finding: 4.51
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 15-SEP-16 Finding: 4.19
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 14-SEP-16 Finding: 3.89
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 13-SEP-16 Finding: 3.61
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 09-SEP-16 Finding: 5.84
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 08-SEP-16 Finding: 5.21
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 07-SEP-16 Finding: 4.91
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 06-SEP-16 Finding: 3.59
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 02-SEP-16 Finding: 4.55
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 02-SEP-16 Finding: 4.4
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 01-SEP-16 Finding: 3.83
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 31-AUG-16 Finding: 4.62
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 30-AUG-16 Finding: 4.09
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date:	29-AUG-16	Finding:	3.78
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-AUG-16	Finding:	4.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-AUG-16	Finding:	3.81
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-AUG-16	Finding:	4.34
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-AUG-16	Finding:	3.83
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-AUG-16	Finding:	3.58
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-AUG-16	Finding:	4.67
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-AUG-16	Finding:	4.42
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-AUG-16	Finding:	3.92
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-AUG-16	Finding:	4.38
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-AUG-16	Finding:	3.98
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-AUG-16	Finding:	3.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-AUG-16	Finding:	4.53
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-AUG-16	Finding:	3.93
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-AUG-16	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-AUG-16	Finding:	4.
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	08-AUG-16	Finding:	3.58
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-AUG-16	Finding:	4.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-AUG-16	Finding:	4.82
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-AUG-16	Finding:	4.27
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-AUG-16	Finding:	5.46
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-AUG-16	Finding:	5.06
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-AUG-16	Finding:	3.75
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-JUL-16	Finding:	5.14
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-JUL-16	Finding:	5.23
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-JUL-16	Finding:	4.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-JUL-16	Finding:	4.81
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-JUL-16	Finding:	4.45
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JUL-16	Finding:	3.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JUL-16	Finding:	3.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JUL-16	Finding:	4.75
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	21-JUL-16	Finding:	4.24
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-JUL-16	Finding:	4.83
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JUL-16	Finding:	0.3
Chemical:	URANIUM MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	19-JUL-16	Finding:	4.12
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JUL-16	Finding:	4.12
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JUL-16	Finding:	6.36
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	19-JUL-16	Finding:	2.47
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	19-JUL-16	Finding:	1.8
Chemical:	URANIUM (PCI/L)	Report units:	PCI/L
Dlr:	1.		
Sample date:	19-JUL-16	Finding:	0.649
Chemical:	URANIUM COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	19-JUL-16	Finding:	2.05
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	18-JUL-16	Finding:	3.49
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUL-16	Finding:	4.67
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JUL-16	Finding:	4.15
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-JUL-16	Finding:	4.68
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-JUL-16	Finding:	4.68
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-JUL-16	Finding:	4.08
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr: 0.4

Sample date: 11-JUL-16 Finding: 3.36
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 08-JUL-16 Finding: 5.05
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 08-JUL-16 Finding: 5.2
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 07-JUL-16 Finding: 4.35
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 07-JUL-16 Finding: 4.35
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 07-JUL-16 Finding: 4.35
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 06-JUL-16 Finding: 4.13
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 06-JUL-16 Finding: 4.13
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 05-JUL-16 Finding: 3.68
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 05-JUL-16 Finding: 3.68
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 01-JUL-16 Finding: 4.53
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 01-JUL-16 Finding: 4.53
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 01-JUL-16 Finding: 4.53
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 01-JUL-16 Finding: 4.53
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date: 01-JUL-16 Finding: 4.53
Chemical: NITRATE (AS N) Report units: MG/L
Dlr: 0.4

Sample date:	01-JUL-16	Finding:	4.71
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-JUN-16	Finding:	3.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-JUN-16	Finding:	5.87
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-JUN-16	Finding:	5.46
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-JUN-16	Finding:	3.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-JUN-16	Finding:	4.67
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-JUN-16	Finding:	4.48
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-JUN-16	Finding:	3.82
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JUN-16	Finding:	5.55
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JUN-16	Finding:	4.76
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-JUN-16	Finding:	3.92
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-JUN-16	Finding:	4.56
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-JUN-16	Finding:	4.06
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-JUN-16	Finding:	3.51
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JUN-16	Finding:	4.06
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-JUN-16	Finding:	3.07
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr: 0.4

Sample date:	09-JUN-16	Finding:	5.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-JUN-16	Finding:	5.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-JUN-16	Finding:	5.68
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-JUN-16	Finding:	5.25
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-JUN-16	Finding:	4.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-JUN-16	Finding:	5.44
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-JUN-16	Finding:	5.33
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-JUN-16	Finding:	4.38
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-MAY-16	Finding:	3.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-MAY-16	Finding:	5.88
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-MAY-16	Finding:	5.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-MAY-16	Finding:	5.49
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-MAY-16	Finding:	4.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-MAY-16	Finding:	3.24
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-MAY-16	Finding:	6.17
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	18-MAY-16	Finding:	6.05
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-MAY-16	Finding:	3.21
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-MAY-16	Finding:	6.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-MAY-16	Finding:	6.27
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-MAY-16	Finding:	6.01
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-MAY-16	Finding:	5.36
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-MAY-16	Finding:	3.27
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-MAY-16	Finding:	4.63
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-MAY-16	Finding:	5.07
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-MAY-16	Finding:	3.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-APR-16	Finding:	5.15
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-APR-16	Finding:	4.99
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-APR-16	Finding:	4.84
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-APR-16	Finding:	3.99
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-APR-16	Finding:	4.82
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-APR-16	Finding:	4.98
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	21-APR-16	Finding:	3.88
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-APR-16	Finding:	5.11
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-APR-16	Finding:	4.95
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-APR-16	Finding:	3.68
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-APR-16	Finding:	5.65
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-APR-16	Finding:	5.49
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-APR-16	Finding:	5.31
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-APR-16	Finding:	3.92
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-MAR-16	Finding:	5.18
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-MAR-16	Finding:	4.98
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-MAR-16	Finding:	3.24
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-MAR-16	Finding:	5.47
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-MAR-16	Finding:	5.23
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-MAR-16	Finding:	3.69
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-MAR-16	Finding:	5.61
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	17-MAR-16	Finding:	5.08
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-MAR-16	Finding:	3.62
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-MAR-16	Finding:	5.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-MAR-16	Finding:	5.23
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-MAR-16	Finding:	3.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-MAR-16	Finding:	4.83
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-MAR-16	Finding:	4.98
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-MAR-16	Finding:	3.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-FEB-16	Finding:	5.75
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-FEB-16	Finding:	5.97
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-FEB-16	Finding:	4.48
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-FEB-16	Finding:	5.28
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-FEB-16	Finding:	5.03
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-FEB-16	Finding:	2.44
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-FEB-16	Finding:	5.79
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-FEB-16	Finding:	5.68
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	10-FEB-16	Finding:	2.62
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-FEB-16	Finding:	1100.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	03-FEB-16	Finding:	6.66
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-FEB-16	Finding:	6.37
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-FEB-16	Finding:	5.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-JAN-16	Finding:	5.43
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-JAN-16	Finding:	5.71
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-JAN-16	Finding:	4.41
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JAN-16	Finding:	7.32
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JAN-16	Finding:	6.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JAN-16	Finding:	6.19
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-JAN-16	Finding:	5.72
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-JAN-16	Finding:	3.03
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JAN-16	Finding:	4.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JAN-16	Finding:	2.02
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	12-JAN-16	Finding:	5.18
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-JAN-16	Finding:	3.13
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-JAN-16	Finding:	6.09
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-JAN-16	Finding:	4.07
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-DEC-15	Finding:	5.03
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-DEC-15	Finding:	2.53
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-DEC-15	Finding:	7.58
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-DEC-15	Finding:	6.27
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-DEC-15	Finding:	3.55
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-DEC-15	Finding:	4.94
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-DEC-15	Finding:	4.25
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-DEC-15	Finding:	2.1
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-DEC-15	Finding:	2.08
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-DEC-15	Finding:	4.13
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-DEC-15	Finding:	2.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-NOV-15	Finding:	2.98
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	24-NOV-15	Finding:	2.28
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-NOV-15	Finding:	4.16
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-NOV-15	Finding:	2.27
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-NOV-15	Finding:	4.67
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-NOV-15	Finding:	4.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-NOV-15	Finding:	4.01
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-NOV-15	Finding:	4.96
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-NOV-15	Finding:	4.58
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-NOV-15	Finding:	4.17
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-OCT-15	Finding:	3.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-OCT-15	Finding:	3.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-OCT-15	Finding:	3.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-OCT-15	Finding:	5.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-OCT-15	Finding:	5.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-OCT-15	Finding:	5.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	14-OCT-15	Finding:	4.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-OCT-15	Finding:	4.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-OCT-15	Finding:	4.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-OCT-15	Finding:	3.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-OCT-15	Finding:	2.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-OCT-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-OCT-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-SEP-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-SEP-15	Finding:	5.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-SEP-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-SEP-15	Finding:	5.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	15-SEP-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-SEP-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-SEP-15	Finding:	9.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-SEP-15	Finding:	9.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-SEP-15	Finding:	9.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-SEP-15	Finding:	9.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-SEP-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-SEP-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-SEP-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-AUG-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-AUG-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-AUG-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	21-AUG-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-AUG-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-AUG-15	Finding:	8.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-AUG-15	Finding:	7.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-AUG-15	Finding:	6.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-JUL-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-JUL-15	Finding:	27.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-JUL-15	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-JUL-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-JUL-15	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	22-JUL-15	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-JUL-15	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-JUL-15	Finding:	35.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-JUL-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-JUL-15	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-JUL-15	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-JUL-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-JUL-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-JUL-15	Finding:	35.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-JUL-15	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-JUN-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-JUN-15	Finding:	35.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-JUN-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-JUN-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	18-JUN-15	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	17-JUN-15	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-JUN-15	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-JUN-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-JUN-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-JUN-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	04-JUN-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	03-JUN-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-JUN-15	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-MAY-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-MAY-15	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-MAY-15	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-MAY-15	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-MAY-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-MAY-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-MAY-15	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-MAY-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	05-MAY-15	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-APR-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-APR-15	Finding:	21.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-APR-15	Finding:	37.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-APR-15	Finding:	36.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-APR-15	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-APR-15	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-APR-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-APR-15	Finding:	35.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-APR-15	Finding:	37.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-APR-15	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-APR-15	Finding:	39.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-MAR-15	Finding:	36.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-MAR-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-MAR-15	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	03-MAR-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-FEB-15	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-FEB-15	Finding:	27.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-JAN-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-JAN-15	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-JAN-15	Finding:	24.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	31-DEC-14	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-DEC-14	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	18-DEC-14	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-DEC-14	Finding:	20.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	03-DEC-14	Finding:	24.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-NOV-14	Finding:	27.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-NOV-14	Finding:	21.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-NOV-14	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-NOV-14	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-OCT-14	Finding:	36.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr: 2.

Sample date: 21-OCT-14 Finding: 35.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 15-OCT-14 Finding: 36.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 07-OCT-14 Finding: 33.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 02-OCT-14 Finding: 34.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 25-SEP-14 Finding: 35.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 16-SEP-14 Finding: 37.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 11-SEP-14 Finding: 40.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 04-SEP-14 Finding: 41.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 26-AUG-14 Finding: 41.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 19-AUG-14 Finding: 38.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 15-AUG-14 Finding: 41.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 05-AUG-14 Finding: 40.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 29-JUL-14 Finding: 42.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 23-JUL-14 Finding: 43.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 16-JUL-14 Finding: 43.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date:	10-JUL-14	Finding:	36.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-JUL-14	Finding:	41.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-JUN-14	Finding:	44.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-JUN-14	Finding:	52.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-JUN-14	Finding:	80.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	05-JUN-14	Finding:	41.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-MAY-14	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-MAY-14	Finding:	52.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-MAY-14	Finding:	64.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-MAY-14	Finding:	40.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-MAY-14	Finding:	44.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-MAY-14	Finding:	41.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-MAY-14	Finding:	92.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-MAY-14	Finding:	92.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-MAY-14	Finding:	83.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-MAY-14	Finding:	95.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	08-MAY-14	Finding:	89.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-MAY-14	Finding:	94.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	38.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	40.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	43.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	44.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-APR-14	Finding:	40.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-APR-14	Finding:	42.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-APR-14	Finding:	44.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-APR-14	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-MAR-14	Finding:	45.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-FEB-14	Finding:	469.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	370.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		

Sample date:	13-FEB-14	Finding:	300.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	7.35
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	1100.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	140.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	28.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	64.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	1.6
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	87.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	130.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	13-FEB-14	Finding:	800.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	13-FEB-14	Finding:	0.62
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	13-FEB-14	Finding:	0.39
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	13-FEB-14	Finding:	46.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-FEB-14	Finding:	10000.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-FEB-14	Finding:	47.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-FEB-14	Finding:	12.37
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported

Dlr:	0.		
Sample date:	15-JAN-14	Finding:	70.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-DEC-13	Finding:	41.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-DEC-13	Finding:	44.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-NOV-13	Finding:	69.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-OCT-13	Finding:	53.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-SEP-13	Finding:	64.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-SEP-13	Finding:	71.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-SEP-13	Finding:	65.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-SEP-13	Finding:	65.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-SEP-13	Finding:	48.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-SEP-13	Finding:	48.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-SEP-13	Finding:	47.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-SEP-13	Finding:	45.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-SEP-13	Finding:	38.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-SEP-13	Finding:	49.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	12-SEP-13	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-SEP-13	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-SEP-13	Finding:	67.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-SEP-13	Finding:	52.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-SEP-13	Finding:	39.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-SEP-13	Finding:	45.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-SEP-13	Finding:	65.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-SEP-13	Finding:	48.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-AUG-13	Finding:	47.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-JUL-13	Finding:	38.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	04-JUN-13	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-MAY-13	Finding:	21.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-APR-13	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-MAR-13	Finding:	20.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-FEB-13	Finding:	1100.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	14-FEB-13	Finding:	21.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr: 2.

Sample date: 10-DEC-12 Finding: 25.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 08-NOV-12 Finding: 21.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 24-OCT-12 Finding: 20.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 20-SEP-12 Finding: 22.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 07-AUG-12 Finding: 24.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 05-JUL-12 Finding: 22.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 19-JUN-12 Finding: 27.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 29-MAY-12 Finding: 21.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 23-MAY-12 Finding: 25.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 16-MAY-12 Finding: 23.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 08-MAY-12 Finding: 25.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 03-MAY-12 Finding: 20.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 19-APR-12 Finding: 25.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Sample date: 28-FEB-12 Finding: 41.
Chemical: NITRATE (AS NO3) Report units: MG/L
Dlr: 2.

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

37
SSE
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000026594**

Well ID:	AGL020027749-WELL	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	WELL
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020027749&assigned_name=WELL&store_num=		
GeoTracker Data:	Not Reported		

H38
East
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000025028**

Well ID:	AGL020001688-CCGC_0588	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	CCGC_0588
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020001688&assigned_name=CCGC_0588&store_num=		
GeoTracker Data:	Not Reported		

H39
East
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000025922**

Well ID:	AGC100000001-CCGC_0588	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	CCGC_0588
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGC100000001&assigned_name=CCGC_0588&store_num=		
GeoTracker Data:	Not Reported		

I40
NE
1/2 - 1 Mile
Lower

FED USGS **USGS40000178592**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E34E002M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19520508
Well Depth:	420	Well Depth Units:	ft
Well Hole Depth:	462	Well Hole Depth Units:	ft

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number

41
NNE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000020657**

Well ID:	AGL020001023-NISHI-AG	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	NISHI-AG
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020001023&assigned_name=NISHI-AG&store_num=		
GeoTracker Data:	Not Reported		

I42
NE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000010846**

Well ID:	AGL020027854-71852	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71852
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020027854&assigned_name=71852&store_num=		
GeoTracker Data:	Not Reported		

43
ENE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000028482**

Well ID:	AGL020027854-71855	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71855
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020027854&assigned_name=71855&store_num=		
GeoTracker Data:	Not Reported		

H44
East
1/2 - 1 Mile
Lower

FED USGS **USGS40000178481**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E34P004M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19650524
Well Depth:	408	Well Depth Units:	ft
Well Hole Depth:	408	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation		Database	EDR ID Number
J45 **ESE** **1/2 - 1 Mile** **Lower**		**CA WELLS**	**11526**

Seq:	11526	Prim sta c:	13S/04E-03C02 M
Frds no:	3510002003	County:	35
District:	05	User id:	HEN
System no:	3510002	Water type:	G
Source nam:	WELL 03	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	365018.0	Longitude:	1213113.0
Precision:	2	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3510002	System nam:	City Of San Juan Bautista
Hqname:	Not Reported	Address:	P O BOX 1086
City:	SN JUAN BAUTISTA	State:	ca
Zip:	95045	Zip ext:	Not Reported
Pop serv:	1655	Connection:	620
Area serve:	SAN JUAN BAUTISTA		

Sample date:	21-SEP-17	Finding:	18.29
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-FEB-16	Finding:	14.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-SEP-15	Finding:	21.4
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-DEC-14	Finding:	2.4
Chemical:	URANIUM (PCI/L)	Report units:	PCI/L
Dlr:	1.		
Sample date:	11-SEP-14	Finding:	370.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	661.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	180.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	51.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	100.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		

Sample date:	11-SEP-14	Finding:	2.1
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	300.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	6.73
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	1700.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	90.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-SEP-14	Finding:	160.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	1.6
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	2.
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	4.5
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	11-SEP-14	Finding:	270.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	11-SEP-14	Finding:	0.44
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	11-SEP-14	Finding:	160.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	11-SEP-14	Finding:	42.
Chemical:	MANGANESE	Report units:	UG/L
Dlr:	20.		
Sample date:	11-SEP-14	Finding:	1100.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	11.87
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	11-SEP-14	Finding:	24000.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	29-MAY-14	Finding:	88.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-MAY-13	Finding:	56.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	05-SEP-12	Finding:	53.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-MAR-12	Finding:	1300.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		

K46
NNE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000027411**

Well ID:	AGL020007774-73092	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	73092
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020007774&assigned_name=73092&store_num=		
GeoTracker Data:	Not Reported		

K47
NNE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000010459**

Well ID:	AGL020001023-NYLAN-AG	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	NYLAN-AG
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020001023&assigned_name=NYLAN-AG&store_num=		
GeoTracker Data:	Not Reported		

L48
North
1/2 - 1 Mile
Lower

FED USGS **USGS40000178689**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E33A002M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19671115
Well Depth:	384	Well Depth Units:	ft
Well Hole Depth:	498	Well Hole Depth Units:	ft

Map ID Direction Distance Elevation	Database	EDR ID Number
L49 **North** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CAEDF0000018457**

Well ID:	AGL020028528-1306-001	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	1306-001
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020028528&assigned_name=1306-001&store_num=		
GeoTracker Data:	Not Reported		

J50 **ESE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CADDW0000021180**

Well ID:	3510002-003	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 03 - RAW - ABANDONED- XCLD		
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3510002-003&store_num=		
GeoTracker Data:	Not Reported		

M51 **ESE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**11035**

Seq:	11035	Prim sta c:	12S/04E-34P05 M
Frds no:	3500573001	County:	35
District:	65	User id:	35C
System no:	3500573	Water type:	G
Source nam:	WELL 01 - INACTIVE	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	365023.0	Longitude:	1213108.0
Precision:	3	Status:	IR
Comment 1:	1020 MISSION VINEYARD RD., SAN JUAN BAUTISTA. WELL IS IN PARK BEHIND		
Comment 2:	LAUNDRY ROOM.	Comment 3:	Not Reported
Comment 4:	Not Reported	Comment 5:	Not Reported
Comment 6:	Not Reported	Comment 7:	Not Reported

System no:	3500573	System nam:	Bessor'S Mhp
Hqname:	Not Reported	Address:	Not Reported
City:	Not Reported	State:	Not Reported
Zip:	Not Reported	Zip ext:	Not Reported
Pop serv:	0	Connection:	0
Area serve:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
N52 **South** **1/2 - 1 Mile** **Higher**	**CA WELLS**	**CADDW0000020831**

Well ID:	3510002-001	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 01 - RAW	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3510002-001&store_num=		
GeoTracker Data:	Not Reported		

L53 **North** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000178700**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E28R001M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	300	Well Depth Units:	ft
Well Hole Depth:	300	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	44	Level reading date:	1988-10
Feet below surface:	75	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	1988-03	Feet below surface:	84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-10	Feet below surface:	81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-03	Feet below surface:	61
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-10	Feet below surface:	75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-03-01	Feet below surface:	63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-03	Feet below surface:	63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-10-01	Feet below surface:	81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-03-01	Feet below surface:	70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-01	Feet below surface:	85

Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-03-01	Feet below surface:	78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03	Feet below surface:	84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-10	Feet below surface:	105.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-03	Feet below surface:	81.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-10	Feet below surface:	110.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03	Feet below surface:	104.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-10	Feet below surface:	113.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-03-12	Feet below surface:	101.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10	Feet below surface:	122
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-03	Feet below surface:	97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10	Feet below surface:	117.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-03	Feet below surface:	100
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10	Feet below surface:	110
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-06	Feet below surface:	106.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-03	Feet below surface:	97.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-10	Feet below surface:	101
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-03	Feet below surface:	90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10	Feet below surface:	95.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-03	Feet below surface:	85.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-03	Feet below surface:	90.3
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1973-03	Feet below surface:	95.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-10	Feet below surface:	96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-03	Feet below surface:	91
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-03	Feet below surface:	83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-03	Feet below surface:	83.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-03	Feet below surface:	98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-03-01	Feet below surface:	84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-02-07	Feet below surface:	85.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-03-01	Feet below surface:	101
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-03-24	Feet below surface:	52.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-11-06	Feet below surface:	65.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-06-04	Feet below surface:	104.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1951-04-06	Feet below surface:	69.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-03-15	Feet below surface:	64.7
Feet to sea level:	Not Reported	Note:	Not Reported

54
East
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000029755**

Well ID:	AGL020002651-71850	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71850
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020002651&assigned_name=71850&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation		Database	EDR ID Number

M55
ESE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000024863**

Well ID:	AGL020002651-71849	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71849
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020002651&assigned_name=71849&store_num=		
GeoTracker Data:	Not Reported		

M56
ESE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000030558**

Well ID:	AGL020027833-FERRY_MORSE	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	FERRY_MORSE
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020027833&assigned_name=FERRY_MORSE&store_num=		
GeoTracker Data:	Not Reported		

M57
ESE
1/2 - 1 Mile
Lower

FED USGS **USGS40000178462**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	012S004E34P003M	Type:	Well
Description:	Not Reported	HUC:	18060002
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19670311
Well Depth:	470	Well Depth Units:	ft
Well Hole Depth:	711	Well Hole Depth Units:	ft

O58
NNW
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000027028**

Well ID:	AGL020002671-H WELL	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	H WELL
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020002671&assigned_name=H WELL&store_num=		
GeoTracker Data:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

O59
NNW
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000027628**

Well ID:	AGC100000001-CCGC_0278	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	CCGC_0278
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGC100000001&assigned_name=CCGC_0278&store_num=		
GeoTracker Data:	Not Reported		

N60
South
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000001843**

Well ID:	13S04E04A003M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	13S04E04A003M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=13S04E04A003M&store_num=		
GeoTracker Data:	Not Reported		

P61
ENE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000014636**

Well ID:	AGL020001023-73086	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	73086
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020001023&assigned_name=73086&store_num=		
GeoTracker Data:	Not Reported		

P62
ENE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000009126**

Well ID:	AGL020001023-NYLAN-DM	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	NYLAN-DM
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020001023&assigned_name=NYLAN-DM&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
63 **East** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CADWR0000012075**

Well ID:	12S04E34Q001M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	12S04E34Q001M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=12S04E34Q001M&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
64 **NNW** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CAEDF0000009415**

Well ID:	AGL020002674-MAC 4	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	MAC 4
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020002674&assigned_name=MAC 4&store_num=		
GeoTracker Data:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
65 **ESE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CAEDF0000013083**

Well ID:	AGL020002651-71848	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	71848
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020002651&assigned_name=71848&store_num=		
GeoTracker Data:	Not Reported		

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
95045	3	1

Federal EPA Radon Zone for SAN BENITO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for SAN BENITO COUNTY, CA

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.350 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5’ Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5’ Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR’s Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California’s Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

APPENDIX B

HISTORICAL AERIAL PHOTOGRAPHS

San Juan School

100 Nyland Drive

San Juan Bautista, CA 95045

Inquiry Number: 7330807.8

May 10, 2023

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

05/10/23

Site Name:

San Juan School
100 Nyland Drive
San Juan Bautista, CA 95045
EDR Inquiry # 7330807.8

Client Name:

McCloskey Consultants Inc
420 Sycamore Valley Road West
Danville, CA 94526
Contact: Belinda Blackie

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	*Scale*	*Details*	*Source*
2020	1"=500'	Flight Year: 2020	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1998	1"=500'	Acquisition Date: August 21, 1998	USGS/DOQQ
1982	1"=500'	Flight Date: July 10, 1982	USDA
1974	1"=500'	Flight Date: January 01, 1974	USGS
1968	1"=500'	Flight Date: June 14, 1968	USGS
1956	1"=500'	Flight Date: June 13, 1956	USDA
1949	1"=500'	Flight Date: August 02, 1949	USDA
1939	1"=500'	Flight Date: June 10, 1939	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

INQUIRY #: 7330807.8

YEAR: 2020

= 500'

N

EDR


INQUIRY #: 7330807.8
YEAR: 2012
= 500'
N
EDR


INQUIRY #: 7330807.8
YEAR: 2009
= 500'
N
EDR

INQUIRY #: 7330807.8

YEAR: 2006

= 500'

N

EDR


INQUIRY #: 7330807.8
YEAR: 1998
= 500'
N
EDR

INQUIRY #: 7330807.8

YEAR: 1982

= 500'

N

EDR

INQUIRY #: 7330807.8

YEAR: 1974

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

INQUIRY #: 7330807.8

YEAR: 1968

= 500'

N

EDR

INQUIRY #: 7330807.8

YEAR: 1956

= 500'

EDR

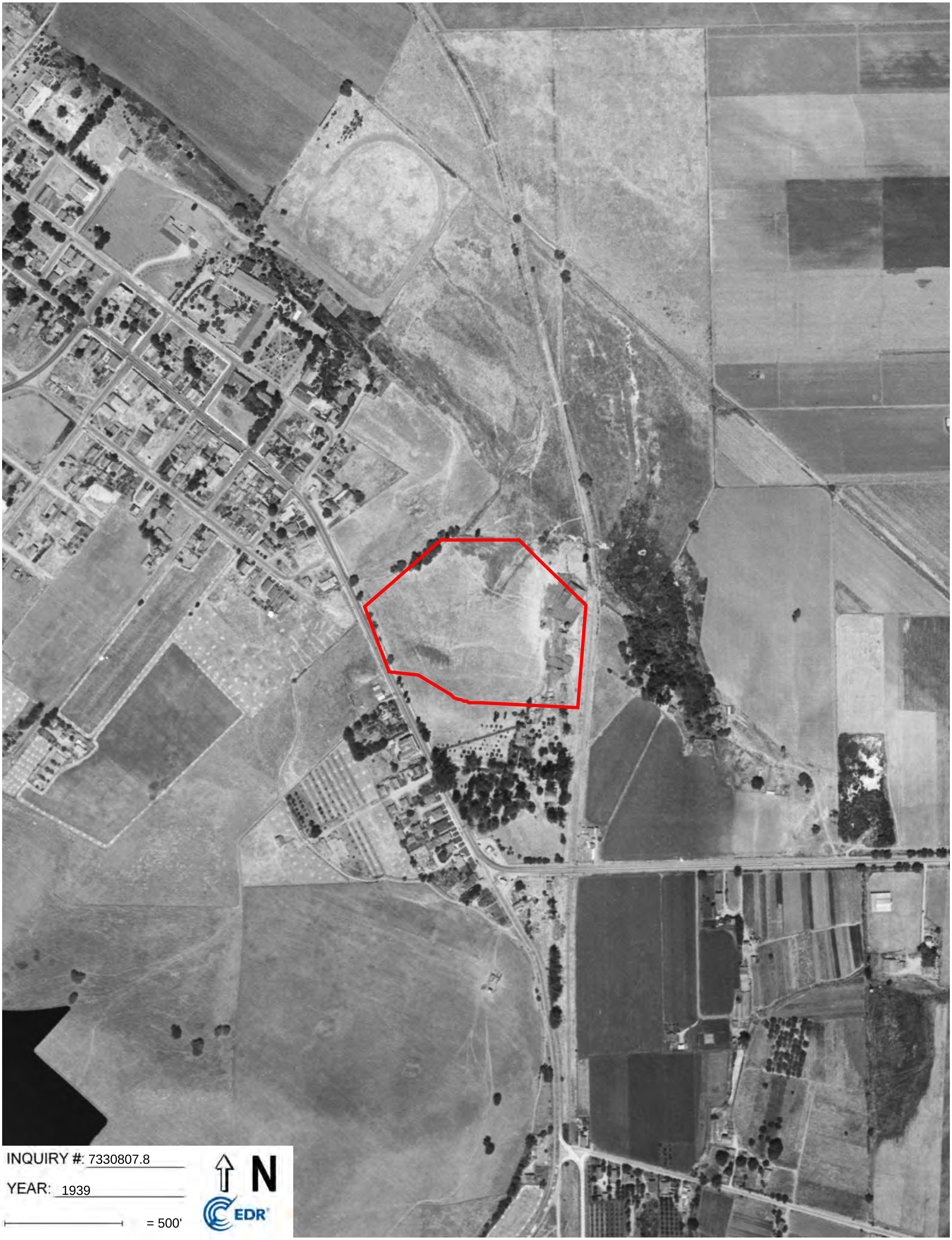
INQUIRY #: 7330807.8

YEAR: 1949

= 500'

N

EDR



INQUIRY #: 7330807.8

YEAR: 1939

= 500'

N

EDR

APPENDIX C

2020 Geologic/Seismic Hazards Investigation Report

GEOLOGIC/SEISMIC HAZARDS INVESTIGATION
PROPOSED RELOCATABLE CLASSROOMS
SAN JUAN SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

Project Number: E83701.02

For:

Aromas San Juan Unified School District
2300 San Juan Highway
San Juan Bautista, California 95045

April 29, 2020

www.mooretwining.com
PH: 559.268.7021
FX: 559.268.7126
2527 Fresno Street
Fresno, CA 93721

April 29, 2020 E83701.02

Ms. Michelle Huntoon, Superintendent
Aromas San Juan Unified School District
2300 San Juan Highway
San Juan Bautista, California 95045

Subject: Geologic/Seismic Hazards Investigation
Proposed Relocatable Classrooms
San Juan School
100 Nyland Drive
San Juan Bautista, California

Dear Ms. Huntoon:

We are pleased to submit this Geologic/Seismic Hazard Investigation report prepared for the proposed relocatable classrooms planned to be located in the northeast portion of the San Juan School campus at 100 Nyland Drive in San Juan Bautista, California. The contents of this report include the purpose of the investigation, scope of services, background information, investigative procedures, our findings, evaluations, conclusions, and recommendations.

We appreciate the opportunity to be of service to Aromas San Juan Unified School District. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience at (800) 268-7021.

Sincerely,

MOORE TWINING ASSOCIATES, INC.

Ken [signature]

REGISTERED GEOLOGIST
KENNETH JAMES CLARK
No EG 1884
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA
Exp 5-31-15

Kenneth J. Clark, CEG
Senior Engineering Geologist

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PROPOSED RELOCATABLE CLASSROOMS
SAN JUAN SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

Project Number: E83701.02

1.0 INTRODUCTION

This report presents the results of a geotechnical engineering and geologic/seismic hazard investigation conducted by our firm for the proposed relocatable classrooms at San Juan School. Moore Twining Associates, Inc. (Moore Twining) was authorized by Aromas San Juan Unified School District to conduct this investigation.

Our firm prepared the referenced 2012 Geotech/Geohazard Report, for the Proposed Seismic Rehabilitation of Six Existing Buildings and Construction of a New Multi-Purpose Building at the campus. The surface fault rupture hazard portion of that investigation was conducted by Fugro and the report was included as an appendix to the 2012 Geotech/Geohazard Report. The 2012 Geotech/Geohazard Report and the 2012 Fugro report are included in Appendix F of this report.

Also, an Updated Surface-Fault Rupture Hazard Investigation report, prepared for the proposed classroom site by Fugro USA Land, Inc. (Fugro) is included as Appendix E of this report .

The contents of this report include the purpose of the investigation and the scope of services provided. The site history, previous studies, existing site features, and anticipated construction are discussed. In addition, a description of the investigative procedures used and the subsequent findings obtained are presented. Finally, the report provides an evaluation of the findings, an evaluation of geologic and seismic hazards, general conclusions, and related recommendations. The report appendices contain the drawings (Appendix A); the logs of borings (Appendix B); the results of laboratory tests (Appendix C); and the results of liquefaction and seismic settlement analyses (Appendix D); the Fault Rupture Hazard Update Report prepared by Fugro (Appendix E); the Surface Fault Rupture Hazard, Geotechnical Engineering and Geologic/Seismic Hazard Investigation report, prepared by Moore Twining for formerly proposed campus improvements (Appendix F); and photographs (Appendix G).

The Geotechnical Engineering Division of Moore Twining, performed the investigation.

2.0 PURPOSE AND SCOPE OF INVESTIGATION

2.1 Purpose: The intent of this investigation was to address the requirements of CGS Note 48, when incorporating the reports previously prepared for San Juan School. The previously prepared reports are referenced herein and are included in Appendix F of this report.

The purpose of this investigation was to conduct supplemental field exploration, a laboratory testing program, evaluate the data collected during the field and laboratory portions of the investigation, and provide the following:

2.1.1 A description of general subsurface soil and groundwater conditions;

2.1.2 Site Class and seismic design parameters (general procedure seismic ground motion parameters per CGS Note 48 - ASCE 7-16, Chapter 11) in accordance with the 2019 California Building Code (does not include a site specific ground motion hazard analysis);

2.1.3 Updated surface fault rupture hazard report including evaluation of the distance from the classroom site to the nearest trace of the San Andreas fault;

2.1.4 Evaluation of liquefaction and seismic settlement;

2.1.5 Regional geology and regional fault maps, geologic map of the site and geologic cross section;

2.1.6 Evaluation of historic seismicity, preparation of a historical earthquake epicenter map relative to the site;

2.1.7 Updated recommendations for design of foundations;

2.1.8 Evaluations of other potential geologic hazards such as flooding, landslides, seiches, tsunamis and volcanic activity in accordance with the CGS requirements;

2.1.9 Evaluation of soil corrosivity potential; and

2.1.10 Final test boring logs and laboratory test results.

This report is provided specifically for the proposed improvements described in the Anticipated Construction section of this report. This investigation did not include site specific ground motion procedures or time histories of earthquake ground motion.

2.2 **Scope:** Our proposal referenced as MTP 20-0124, dated February 25, 2020, outlined the scope of our services. The actions undertaken during the investigation are summarized as follows:

2.2.1 An Overall Site Plan-Sheet A1.1 (referred to in this report as the site plan), prepared by Belli Architectural Group, dated March 17, 2020, emailed to our firm on April 3, 2020, was reviewed.

2.2.2 A report prepared by our firm entitled "*Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation, Proposed Seismic Rehabilitation of Six Existing Buildings and Construction of a New Multi-Purpose Building, San Juan School, 100 Nyland Drive, San Juan Bautista*," dated December 24, 2012, was reviewed. This report is referred to herein as the "2012 Geotech/Geohazard Report".

2.2.3 A visual site reconnaissance and a subsurface exploration program including test borings were conducted.

2.2.4 Laboratory tests were conducted to determine selected physical and engineering properties of the subsurface soils.

2.2.5 Mr. Dan Carrillo (Aromas San Juan Unified School District), Mr. John Dominguez (School Site Solutions, Inc.), and Ms. Janet Sowers (Fugro), were consulted during the investigation.

2.2.6 The data obtained from the investigation were evaluated to develop an understanding of the subsurface soil conditions and the engineering properties of the subsurface soils.

2.2.7 This report was prepared to present the purpose and scope, background information, field exploration procedures, findings, evaluation, conclusions, and recommendations.

3.0 BACKGROUND INFORMATION

The site description, site history and previous studies, site description, and the anticipated construction are summarized in the following subsections.

3.1 **Site Description:** The project site is located at the San Juan School campus, which is located at 100 Nyland Drive in San Juan Bautista, San Benito County, California. A site location map is presented on Drawing No. 1 in Appendix A.

The majority of the San Juan School campus is located in an Earthquake Fault Zone designated by the State of California, as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act. The proposed relocatable classrooms, planned in the northeast portion of the campus, will be located within the Earthquake Fault Zone. The proposed locations for the classrooms are shown on Drawing No. 2 in Appendix A.

The ground surface in the area of the proposed classrooms is covered with an asphaltic concrete play court pavement and the ground surface appears to be relatively flat. According to the 7½ minute series topographic map (San Juan Bautista Quadrangle, 1997), produced by the United States Geological Survey (USGS), the estimated elevation of the classroom site is roughly 200 feet above mean sea level. The site is located at a latitude of 36.8427 degrees and a longitude of -121.5316 degrees.

The classroom site was bound to the north and east by unimproved ground with low grasses and a few mature trees, and a chainlink fence about 30 feet to the northeast, to the north and northwest by unimproved ground and an existing portable type classroom building located about 50 feet to the northwest, to the west and southwest by asphaltic concrete paved play courts, and to the south by existing concrete flatwork and a permanent classroom building located about 50 feet to the south of the proposed classroom site.

The site area and visible exterior portions of the school campus buildings and flatwork located within about 100 feet of the proposed classroom site, were observed by the undersigned engineering geologist on March 27, 2020. The exterior of the permanent classroom building walls observed to the south of the classroom site appeared to be painted concrete. During our site reconnaissance, signs of distress indicative of excessive differential foundation movement and/or fault movement were not observed in the exterior walls of the buildings, nor in the Portland cement concrete flatwork adjacent to the buildings.

It should be noted that Fugro conducted observations of the classroom site and areas near the mapped trace of the San Andreas as part of this investigation for the purpose of preparing an updated surface fault rupture hazard report. Fugro’s observations are included the Fault Rupture Hazard Update Report, in Appendix E of this report.

3.2 **<u>Site History and Previous Studies</u>:** It is our understanding that the school campus was originally constructed about 1968. Prior to construction of the existing school campus, it is our understanding that the area of the existing school campus was primarily utilized for agricultural purposes or was vacant open land. The general area proposed for the classrooms was formerly occupied by two portable type classroom buildings. It is our understanding that the buildings were removed in August of 2019.

No previous reports of geotechnical engineering investigations, compaction testing or environmental studies conducted for the classroom site area were provided for review during this investigation. If available, these reports should be provided for review and consideration for this project.

Our firm prepared the referenced 2012 Geotech/Geohazard Report, for the Proposed Seismic Rehabilitation of Six Existing Buildings and Construction of a New Multi-Purpose Building at the campus. The 2012 Geotech/Geohazard Report is included as Appendix F of this report. The buildings formerly proposed for seismic rehabilitation are located south of the proposed classroom site and the formerly proposed Multi-Purpose Building was to be located about 300 feet west of the proposed classroom site.

The surface fault rupture hazard portion of that investigation was conducted by Fugro and is included as an appendix to the 2012 Geotech/Geohazard Report. The 2012 Geotech/Geohazard Report indicated that the surface-fault rupture hazard investigation report (prepared by Fugro, 2012) concluded that geomorphic indicators suggestive of active faulting were not noted on or adjacent to the school site in the areas investigated, the potential for fault rupture on the site is considered low.

The 2012 Geotech/Geohazard Report presented the results of liquefaction analyses and stated: *"The results of the analysis indicate that liquefaction would not occur in the majority of the sandy soils due to the relatively high N-values obtained for those soils. As detailed in the surface-fault rupture hazard investigation, the soils present below the high groundwater level are Pleistocene age. The analysis indicates seismic settlements of up to about ¼ inch could occur as a result of the design level seismic event."*

The following reports were reviewed as part of preparing the 2012 Geotech/Geohazard Report, and are referenced in the Fault Rupture Hazard Update Report prepared by Fugro (Appendix E of this report).

> Fault Location Investigation, San Juan Junior High School Additions...," prepared by Cleary Consultants, Inc., dated April 30, 1987.
>
> Geologic, Seismic and Fault Hazards Assessment Report, Proposed Kindergarten Building Addition, San Juan Elementary School...," prepared by D & M Consulting Engineers, Inc., dated November 12, 2002.

3.3 Anticipated Construction: The proposed relocatable classrooms are planned to be located side by side in the northeast portion of the campus. Each relocatable classroom building has plan dimensions of about 25 by 45 feet. It is our understanding that the classrooms are to be supported on the existing pavement.

4.0 INVESTIGATIVE PROCEDURES

The field exploration and laboratory testing programs conducted for this investigation are summarized in the following subsections.

4.1 Field Exploration: The field exploration consisted of a site reconnaissance, drilling test borings, soil sampling, and standard penetration tests.

4.1.1 Site Reconnaissance: The site reconnaissance consisted of walking the site and noting visible surface features. The reconnaissance was conducted by a Moore Twining engineering geologist on March 27, 2020. The features noted are described in the "Background Information" section of this report. The site observations made by Fugro for the fault rupture hazard investigation (Appendix E of this report) are discussed in Section 8.0 of this report.

4.1.2 Drilling Test Borings: The depths of the borings were selected based on the type of construction, the depth of influence of the anticipated foundation loads and the subsurface soil conditions. The locations of the borings were determined by Moore Twining based on the locations of the proposed improvements.

On April 3, 2020, two (2) borings (B-1 and B-2) were drilled at the classroom site with a CME-75 drill rig to depths of 50 and 16½ feet below site grades (BSG). The CME-75 drill rig was equipped with 6⅝-inch outside diameter (O.D.) hollow-stem augers. The approximate locations of the borings are depicted on Drawing No. 2 in Appendix A of this report. A hand auger was used to excavate at each boring to a depth of 3 feet BSG to reduce the potential for damaging underground utilities.

The borings were drilled under the direction of a Moore Twining engineering geologist. The field soil classification was in accordance with the Unified Soil Classification System and consisted of particle size, color, and other distinguishing features of the soil.

The presence and elevation of free water, if any, in the borings were noted and recorded during drilling and immediately following completion of the test borings.

Test boring locations were determined by pacing with reference to the existing site features and are considered approximate. The boreholes were loosely backfilled with material excavated during the drilling operations. Due to the loose nature of the test boring backfill, some settlement of the backfill should be anticipated.

4.1.3 Soil Sampling: During drilling, standard penetration tests were conducted, and both disturbed and relatively undisturbed soil samples were obtained.

The standard penetration resistance, N-value, is defined as the number of blows required to drive a standard split barrel sampler into the soil. The standard split barrel sampler has a 2-inch O.D. and a 1⅜ inch inside diameter (I.D.). The sampler is driven by a 140-pound weight free falling 30 inches. The sampler is lowered to the bottom of the bore hole and set by driving it an initial 6 inches. It is then driven an additional 12 inches, or portion thereof, and the number of blows required to advance the sampler an additional 12 inches, or portion thereof, is recorded as the N-value.

Relatively undisturbed soil samples for laboratory tests were obtained by pushing or driving a California modified split barrel ring sampler into the soil. The soil was retained in brass rings, 2.5 inches O.D. and 1-inch in height. The lower 6-inch portion of the samples were placed in close-fitting, plastic, airtight containers which, in turn, were placed in cushioned boxes for transport to the laboratory. Soil samples obtained were taken to Moore Twining's laboratory for classification and testing. In addition, bulk samples of soil were obtained for laboratory testing.

4.2 **Laboratory Testing**: The laboratory testing was programmed to determine selected physical and engineering properties of the soils sampled and tested. The tests were conducted on disturbed and relatively undisturbed samples considered representative of the subsurface materials encountered.

The results of laboratory tests conducted on samples obtained from the test borings are summarized on the laboratory plate figures in Appendix C. These data, along with visual observations of the soil, were used to prepare the final test boring logs in Appendix B.

5.0 FINDINGS AND RESULTS

The findings and results of the field exploration and laboratory testing are summarized in the following subsections.

5.1 **Surface Conditions:** Both of the borings drilled in the proposed classroom area encountered asphaltic concrete (AC) pavements comprising 2 and 2½ inches of AC over 4 inches of aggregate base (AB).

5.2 **Soil Profile:** The near surface soils encountered at the classroom site comprised clayey sand fill soil extending to a depth of about 3 feet in both borings. In boring B-1, loose to dense native silty sands were encountered below the fill soils, and extended to a depth of 28½ feet BSG. The silty sands were underlain by stiff to very stiff sandy lean clay extending to a depth of 38½ feet BSG. The sandy lean clay was underlain by medium dense to very dense silty sand, which extended to 50 feet BSG, the maximum depth explored. In boring B-2, medium dense clayey sands were encountered below the fill soils, and extended to a depth of about 4½ feet BSG. The clayey sands were underlain by medium dense silty sands extending to a depth of 16½ feet BSG, the maximum depth explored in boring B-2.

The foregoing is a general summary of the soil conditions encountered in the test borings drilled for this investigation. Detailed descriptions of the soils encountered at each test boring are presented on the logs of borings in Appendix B. The stratification lines shown on the logs represent the approximate boundary between soil types; the actual in-situ transition may be gradual. General soil profiles are also shown on the cross sections on Drawing No. 7 in Appendix A of this report.

5.3 **<u>Groundwater Conditions</u>:** During our April 3, 2020 exploration, groundwater was encountered at the classroom site in borings B-1 and B-2 at depths of 13½ and 16 feet BSG, respectively. The depth of groundwater measured through the augers after drilling boring B-1 was 11 feet BSG.

On November 21, 2012, groundwater was encountered in test borings drilled at the location of the formerly proposed multi-purpose building (about 300 feet west of the proposed classroom buildings). In one of the borings, groundwater was encountered at 25 feet BSG during drilling and was measured in the open borehole at 14 feet BSG about 2 hours after termination of drilling. In another boring, groundwater was encountered at 14½ feet BSG during drilling and measured in the open borehole at 14 feet BSG about 15 minutes later, after termination of drilling.

Groundwater was encountered at a depth of 28 feet below the ground surface during the 2002 geologic/seismic and fault hazards assessment for the kindergarten building assessment conducted by D&M Consulting Engineers, Inc.. However, because the consultant used rotary wash (mud rotary) drill techniques, they were unable to determine a stabilized depth to groundwater in the borehole.

The site is located along the western margin of the San Juan Valley, about 1,300 feet northeast of the range front. The rise of the water levels within the test borings indicates that the groundwater is under a semi-confined condition in the sand units and the clayey units are acting as aquitards. Groundwater level history information was not available for this site. Considering the depth to groundwater noted in the current and previous investigations, a high groundwater depth of 10 feet BSG was estimated for this project.

It should be recognized, that water table elevations fluctuate with time, since they are dependent upon seasonal precipitation, irrigation, land use, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered both during the construction phase and the design life of the project. The evaluation of such factors was beyond the scope of this investigation and report.

6.0 GENERAL GEOLOGIC CONDITIONS AND FAULTING

6.1 Geomorphic and Geologic Setting: The site is located near the western margin of the San Juan Valley. Based on our review of several geologic maps including the Preliminary Geologic Map of the San Juan Bautista Quadrangle, San Benito and Monterey Counties, California (Dibblee, Nilsen, and Brabb, 1979), the site is underlain by Quaternary alluvium. The Geologic Map of California, Santa Cruz Sheet (third printing, 1971), indicates the site area is underlain by Quaternary terrace deposits (Drawing No. 3 in Appendix A). According to the Division of Mines Bulletin 133, Geology of the San Juan Bautista Quadrangle, California (Allen, 1946), the site area is mapped as Quaternary (Upper Pleistocene) terrace deposits, and cross sections indicate that the terrace deposits are underlain by San Juan Bautista Formation (later termed the San Lorenzo formation by Dibblee et al., 1979) described as *"as much as 1,500 feet of poorly bedded, fine-grained, fossiliferous, argillaceous and calcareous sandstones, carbonaceous grits often containing numerous wood fragments, and shales."* The cross sections also indicate that the San Juan Bautista Formation is underlain by Santa Lucia Quartz Diorite.

A site geologic map and soil profile cross section are presented as Drawing Nos. 6 and 7, in Appendix A.

A Regional geologic map is included in Appendix A as Drawing Nos. 3.

6.2 Regional Faulting: An "active fault" is defined, for the purpose of this evaluation, as a fault that has had surface displacement within the Holocene Epoch (about the last 11,700 years). Potentially active faults also contribute to the seismicity of the site. A widely accepted definition of "potentially active" is a fault that does not show evidence of displacement during the Holocene, but shows evidence of displacement occurring less than 1.6 million years ago (after the beginning of the Pleistocene Epoch). Since the Quaternary Period includes the Holocene and Pleistocene Epochs, Quaternary Faults are those that have documented latest fault displacement within the Holocene or Pleistocene Epochs, undifferentiated. Faults showing evidence of displacement older than 1.6 million years are usually classified as "Pre-Quaternary" and "inactive." Pre-Quaternary faults do not impact the site seismicity.

Major active faults occur to the east, west, south, and north of the project site. The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act. The mapped trace of the San Andreas Fault Zone is located about 165 feet northeast of the proposed classroom buildings. Numerous other active and potentially active faults also occur in the site region. The Zayante-Vergeles is located about 3 miles southwest of the site and the Calaveras fault is located about 7 miles east of the site. The nearby major fault systems within about 100 miles of the site are depicted on Drawing No. 4 in Appendix A of this report.

Discussion of surface fault rupture hazard is provided in Section 8.0 and Appendix E of this report.

7.0 SITE SEISMICITY

Design level seismic groundshaking and seismic coefficients/earthquake spectral response acceleration design values for the site are described below. For any given earthquake, the rock in the immediate vicinity will respond with a certain maximum acceleration and with a predominant period that depends on the nature of the rock and the source mechanism. Away from the focus of the earthquake, the ground motions begin to attenuate. The way in which the earthquake wave is altered depends to a great degree on source characteristics and to a lesser degree on the travel path.

7.1 Historic Seismic Activity: The general site region has experienced recurring seismic activity. Based on historical earthquake data obtained from the U.S. Geological Survey's earthquake database system, approximately 237 historical earthquakes with magnitude 4.5 or greater have been recorded from 1900 through April 27, 2020, within about 100 miles of the site. A map showing the location of the project site with relation to the approximate historical earthquake epicenter locations and magnitude category is presented on Drawing No. 5 in Appendix A of this report.

The nearest earthquake event (estimated magnitude = 4.6, estimated peak ground acceleration = 0.15g) found during the search occurred on March 28, 1948, approximately 1½ miles west of the site. The largest magnitude earthquake identified in the 100 mile radius search was the 7.9 magnitude Great Earthquake of San Francisco which occurred on April 18, 1906, approximately 80 miles northwest of the site. The maximum estimated peak horizontal acceleration of 0.173g occurred at the site resulting from an earthquake occurring on June 24, 1939, about 5.4 miles southeast of the site.

Several large earthquakes occurred near San Juan Bautista during the 1800's. Toppozada et al. describe numerous earthquakes of likely greater than magnitude 6.0 in the San Juan Bautista region occurring during 1840 and 1841 (“one of the most seismically active historical periods in the San Juan Bautista vicinity”). Toppozada suggests that the high seismicity was aftershock activity occurring near the rupture end of the 1838 earthquake (a approximate M=7.0 earthquake with 60 km rupture length extending north of the Loma Prieta rupture). A number of earthquakes of magnitude 5.0 or greater also occurred within about 12 miles of San Juan Bautista between 1883 and 1910.

7.2 Deaggregation of Seismicity: The seismicity of the site area was evaluated based on the results of deaggregation of the 2,475 year return period event (2 percent probability of exceedance in 50 years) using the United States Geological Survey deaggregation website (https://earthquake.usgs.gov/hazards/interactive/), Dynamic Conterminous U.S. 2014 V 2.0 Edition.

The primary seismic sources contributing to design seismic ground motion estimates for the site is the San Andreas fault (Santa Cruz Mountains segment) accounting for about 80 percent of the site seismicity. The combined site seismicity contribution of the San Andreas (Creeping segment) and the Calaveras fault is indicated to be about 10 percent. The predominant moment magnitude is indicated to be 7.08 and a modal source distance of about 0.2 miles from the site.

7.3 **<u>Seismic Ground Motion Parameters and Site Class:</u>** Seismic coefficients and spectral response acceleration values were developed based on the 2019 California Building Code (CBC) and ASCE 7-16. The methodology for determining design ground motion values is based on U.S Geological Survey seismic hazard maps, which incorporate both probabilistic and deterministic seismic ground motion. The Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website (https://seismicmaps.org/) was used.

The site is classified as a stiff soil (D) site with a weighted average standard penetration resistance, N-value between 15 and 50 blows per foot for the upper 100 feet BSG.

The following seismic factors were developed using online data obtained from the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website (https://seismicmaps.org/) based a Site Class D, a latitude of 36.8427 degrees and a longitude of -121.5316 degrees. The data provided in the following table are based upon the procedures of Sections 1613A.2.1 through 1613A.2.4 of the 2019 California Building Code and were not determined based upon a ground motion hazard analysis. Although it is not anticipated that a ground motion hazard analysis would be typical for pre-approved relocatable structures such as those planned for this project, the project designer should review the information included in this report and determine whether a ground motion hazard analysis is required for the project considering the seismic design category, structural details, and requirements of ASCE 7-16 (Section 11.4.8 and other applicable sections). If required, Moore Twining should be notified and requested to conduct the additional analysis, develop updated seismic factors for the project, and update the following values.

Item	2019 CBC Value
Site Class	D
Maximum Considered Earthquake (geometric mean) peak ground acceleration adjusted for site effects (PGA_M)	1.044
Mapped Maximum Considered Earthquake (geometric mean) peak ground acceleration (PGA)	0.949
Spectral Response At Short Period (0.2 Second), Ss	2.222
Spectral Response At 1-Second Period, S_1	0.924
Site Coefficient, Fa	1.0
Site Coefficient, Fv	See Note
Maximum considered earthquake spectral response acceleration for short period, S_{MS}	2.222
Maximum considered earthquake spectral response acceleration for 1 second, S_{M1}	See Note
Five percent damped design spectral response acceleration for short period, S_{DS}	1.481
Five percent damped design spectral response acceleration at 1-second period, S_{D1}	See Note
T_S (S_{D1}/S_{DS})	0.707

Notes: Requires ground motion hazard analysis per ASCE Section 21.2 (ASCE 7-16, Section 11.4.8), unless an Exception of Section 11.4.8 of ASCE 7-16 is applicable for the project design.
Ts value calculated using Long-Period Site Coefficient, Fv, from Table 11.4-2 of ASCE 7-16 Supplement 1.

8.0 SURFACE FAULT RUPTURE: Earthquakes are caused by the sudden displacement of earth along faults with a consequent release of stored strain energy. The fault slippage can often extend to the ground surface where it manifests in abrupt relative ground displacement across a rupture surface. Damage resulting directly from fault rupture ground displacement occurs only where structures are located astride a rupture surface with relative displacement.

The locations of active and potentially active faults in the site region were established using the on-line 2010 Fault Activity Map of California: California Geological Survey, Geologic Data Map No. 6 (Jennings and Bryant), the U.S.G.S. Quaternary fault database, and the Special Studies Zone official map, San Juan Bautista Quadrangle. A map depicting the major active faults in the vicinity of the site is included on Drawing No. 4 in Appendix A of this report.

The project site is located in an Alquist-Priolo Earthquake Fault Zone for the San Andreas fault.

Fugro conducted a fault rupture hazard update for the proposed classroom building site (see Appendix E of this report). On April 8, 2020, Fugro geologists conducted three (3) traverses in the area of the proposed classrooms and mapped trace of the San Andreas Fault. The "Discussion and Conclusions" section of the Fault Rupture Hazard Update Report, in Appendix E of this report, states: "*Based on examination of the geomorphic features and on review of existing fault trenching data, the likelihood of secondary fault splay through the proposed building site is judged to be low. We identified no geomorphic evidence from field reconnaissance or from high resolution topographic data that would indicate the presence of a secondary fault splay that would extend closer to the school than the base of the scarp....The prominent linear scarp, assumed to represent the trace of the San Andreas fault northeast of the campus, does not coincide well with the trace of the San Andreas fault as mapped by the California Geological Survey and shown on the Quaternary fault and fold database (USGS/CGS). The base of the linear scarp along the north side of the school is 50 to 85 feet west of the mapped trace (Figure 3.1), significantly closer to the school. Our interpretation is that the discrepancy falls within the margin of error of the original fault mapping....Assuming the base of the escarpment adjacent to the school (Local San Andreas Fault on Figure 3.1) most closely represents the location of the primary trace of the San Andreas fault, the nearest edge of the proposed buildings is located 75 to 85 feet away from the surface trace of the fault, thus, the proposed site for the buildings meets the State of California 50-foot setback requirements.*"

9.0 LIQUEFACTION AND SEISMIC SETTLEMENT: Liquefaction and seismic settlement are conditions that can occur under seismic shaking from earthquake events. Liquefaction describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movements of the soil mass, combined with loss of bearing usually results. Fine, well sorted, loose sand, shallow groundwater conditions, higher intensity earthquakes, and particularly long duration of ground shaking are the requisite conditions for liquefaction.

The subject site is located in an area has **not** been mapped by the California Geological Survey for liquefaction hazards.

Liquefaction analysis was conducted using an historic high groundwater depth of 10 feet based on the discussion in Section 5.3 of this report. The analyses were conducted using the computer program LIQUEFYPRO by Civiltech. A peak ground acceleration adjusted for site effects (PGA_M) of 1.044g was used in the liquefaction analysis. An earthquake magnitude of 7.08 was applied in the analysis based on deaggregation analysis (United States Geological Survey deaggregation website https://earthquake.usgs.gov/hazards/interactive/).

The SPT N-values from boring B-1 were relied upon in the analysis. Soil parameters, such as wet unit weight, N-value, and fines content were input for the soil layers encountered throughout the depths explored (see test boring log B-1 in Appendix B). A safety factor of 1.3 was used in accordance with CGS Note 48. A hammer energy correction of 1.5 was used in the analysis (see Report on: Energy Measurement for Dynamic Penetrometers in Appendix G).

The results of the analyses indicates that liquefaction would occur as a result of the design level seismic event in silty sands at depths between about 13 and 19 feet BSG. The results of the analysis indicate a total seismic settlement of about 2 inches. A differential seismic settlement of about 1 inch in 30 feet is estimated. Tabular and graphical results of the seismic settlement analyses are included in Appendix D.

The potential for lateral spreading is considered low based on energy corrected $N_{1\ 60}$ values exceeding 15 (Youd, Hansen, and Bartlet, 2002) in saturated granular layers (see $N_{1\ 60}$ values provided in liquefaction analyses output (Appendix D).

10.0 **<u>LANDSLIDES AND SLOPE STABILITY</u>**: The area near the proposed classroom site is relatively flat extending in all directions for at least 30 feet. The closest slope to the site is to the northeast. Beyond 30 feet to the northeast (past the site property fence), the ground surface falls at an average of about 5½ percent for about 135 feet to the approximate location of USGS/CGS mapped trace of the San Andreas faul (based on LIDAR topographic data cited in Appendix E of this repoort). Considering the location and grade of the nearest slope, landslide hazard is not anticipated to be a factor for the project.

11.0 **<u>EXPANSIVE SOILS</u>:** One of the potential geotechnical hazards evaluated at this site is the expansion potential of the near surface soils. Over time, expansive soils will experience cyclic drying and wetting as the dry and wet seasons pass. Expansive soils experience volumetric changes (shrink/swell) as the moisture content of the clayey soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade when not designed for the anticipated expansive soil pressures. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction.

The potential for damage to slabs-on-grade and foundations supported on expansive soils can be reduced by placing non-expansive fill underlying foundations and slabs-on-grade.

The results of an Atterberg Limits test conducted on near surface soils indicate a medium plasticity. The result of an expansion index tests conducted on clayey sands near the existing classrooms building south of the new classroom building site indicated low expansion potential, with an expansion index value of 41.

The results of the Atterberg Limits and expansion index testing (conducted for our previous investigation at the campus) suggest that some relatively minor swell could occur and potentially cause heave and cracking to occur to the existing pavements. Since the structure is to be supported above the pavements and will not include a floor slab on grade, potential impacts of expansive soils to the structure is not a concern.

12.0 CONDITIONAL GEOLOGIC HAZARDS: Conditional geologic hazards, as identified in Section 31 of California Geological Survey Note 48 are discussed in the following subsections.

12.1 Hazardous Materials: Hazardous materials such as methane gas, hydrogen-sulfide gas and tar seeps are not known to be present in the project area and are not considered to be a concern at the subject site.

12.2 Volcanic Activity: California includes six volcanic regions that include volcanoes that have erupted within the last 100,000 years and are considered potential volcanic hazard sources (Miller, 1989). The subject site is not located in any of these six volcanic regions and the closest areas of Quaternary volcanism are the Mono Lake- Long Valley and Clear Lake areas located about 140 miles north and 150 miles east of the site. Considering no known areas of Quaternary volcanism are present within 100 miles of the site, the prospect for lava flows or significant ash falls at the site during the design life of the development is considered low.

Based on the distance of volcanic hazards from the site, the prospect for volcanic hazards to impact the site during the design life of the facility is considered low.

12.3 Flooding: Based on the Flood Insurance Rate Map, Community Panel number 06069C0158D, revised on April 16 2009, distributed by the Federal Emergency Management Agency, the existing school buildings A, B, C, D, E, and G and the majority of the proposed location for the multi-purpose building are located in Zone X. According to the Flood Insurance Rate Map Zone X is defined as areas outside the 0.2 percent annual chance flood plain. A portion of the northwest corner of the location for the multi-purpose building appears to be near or within "Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood. The Safety Element of the San Juan Bautista General Plan states: *"During a 100 year storm, the Salinas Grade tributary to San Juan Creek could flood Alameda Plaza, San Juan Inn, part of the School, and homes along The Alameda south of 156."*

According to the San Benito County General Plan Update, August 19, 2010: *"San Benito County could be affected by dam failure inundation from a few, relatively small dams and reservoirs, including the San Justo Reservoir located three miles southwest of Hollister and the Leroy Anderson Dam, which is located in Santa Clara County but has a dam inundation zone that covers a part of San Benito County."* The Safety Element of the San Juan Bautista General Plan does not identify any dams that would pose an inundation hazard to the school site.

12.4 Seiches and Tsunamis: A seiche is a wave generated by the periodic oscillation of a body of water whose period is a function of the resonant characteristics of the containing basin as controlled by its physical dimensions. These periods generally range from a few minutes to an hour or more. The site is not located near any large bodies of water, so seiches are not considered a significant hazard at the site.

Tsunamis are waves generated in oceans from seismic activity. Due to the inland location of the site, tsunamis are not considered a significant hazard for the site.

12.5 Radon Gas: Naturally occurring radon gas is known to occur in some areas of California. Radon gas can accumulate in buildings and breathing air with elevated radon concentrations results in an increased risk of developing lung cancer. Radon gas forms from radioactive decay of small amounts of the elements uranium and thorium, naturally present in rocks and soils. Rock types, such as black shales, marine phosphatic rocks, and certain igneous rocks, are associated with relatively higher levels of radon gas than other rock types. These rock types are not known to be present near the ground surface at the project site.

Based on our review of a database maintained by the California Department of Public Health Services (CDPH) on the California Geologic Survey website, the California Indoor Radon Levels Sorted By Zip Code, last updated February 2016, indicates that 1 of the 27 radon tests conducted within the same zip code as the school site reported levels of radon gas exceeding 4 picocuries per liter. The U.S. EPA recommends that individuals avoid long-term exposure to radon concentrations above 4 picocuries per liter.

Considering the geologic conditions of the site area, the referenced data reported by the DHS, and assuming that the buildings will be properly ventilated, it is our opinion that potential hazards associated with radon gas are low.

12.6 Naturally Occurring Asbestos: Asbestos occurs in soil and rock naturally in certain geologic settings in California. It has been documented that inhalation of asbestos fibers may cause negative health effects. Most commonly, asbestos is associated with serpentinite and partially serpentized ultramafic rocks. Ultramafic rocks are scattered throughout much of the Sierra Nevada mountain and Coast Ranges regions. Review of the referenced Open-File Report 2000-19, titled *A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos*, prepared by State of California Department of Conservation, Division of Mines and Geology, dated August, 2000, does not indicate the occurrence of ultramafic rocks within 10 miles of the site. Ultramafic rocks were not encountered and are not common to the geologic environment of the site. Based on the cited literature and our site observations, it is our opinion that the potential to encounter surface or near surface naturally occurring asbestos containing rock at the site is low.

12.7 Hydrocollapse: Hydrocollapse is typically associated with leaching and disturbance of soils above hardpan layers, or debris flow type deposition. Conditions encountered in the borings drilled for this investigation, were not consistent with either hardpan formation nor debris flow type deposition. Review of boring and trench logs conducted for our previous investigations at the campus (Appendix F) did not reveal conditions indicative of hardpan formation or debris flow type deposition. The results of consolidation testing conducted for our previous investigation at the campus did not reveal a potential for hydrocollapse in near surface soils. Accordingly, the potential for hydrocollapse is considered low at the site.

12.8 Regional Subsidence: The site region is not subject to regional subsidence, thus, subsidence is not a concern for the project.

12.9 Corrosion and Sulfate Attack: Testing conducted for the formerly proposed multipurpose building indicated a“moderately corrosive” (5,000 and 6,100 ohm-centimeter) corrosion potential for buried metal objects and corrosion of concrete due to sulfate attack was not anticipated based on sulfate concentrations of 0.0029 and 0.00073 percent by dry weight (negligible classification). It is our understanbing that neither highly corrosive soils nor sulfate attack have been a problem at the campus and the potential for highly corrosive soils and/sulfate attack on concrete a is concidered low.

13.0 CONSIDERATION OF GEOLOGIC/SESIMIC HAZARD CONDITIONS AND GEOTECHNICAL ENGINEERING RECOMMENDATIONS

The geologic conditions/hazards described in this report do not necessitate special geotechnical design measures for the proposed portable classroom buildings. Based on the results of this investigation and considering the field and laboratory results of our previous investigation for the formerly proposed seismic retrofitting and the formerly proposed multi-purpose building, the new classrooms can be supported on pavements using an allowable bearing capacity of 1,500 pound per square foot, and an allowable increase of one-this for seismic conditions. If required for foundation support, an allowable passive resistance of soils may be assumed to be equal to the pressure developed by a fluid with a density of 250 pounds per cubic foot.

14.0 CONCLUSIONS

Based on the data collected during the field exploration and laboratory testing programs, and our understanding of the anticipated construction, the following general conclusions are presented.

14.1 The near surface soils encountered at the classroom site comprised clayey sand fill soil extending to a depth of about 3 feet. In boring B-1, loose to dense native silty sands were encountered below the fill soils, and extended to a depth of 28½ feet BSG. The silty sands were underlain by stiff to very stiff sandy lean clay extending to a depth of 38½ feet BSG. The sandy lean clay was underlain by medium dense to very dense silty sand, which extended to 50 feet BSG, the maximum depth explored. In boring B-2, a medium dense clayey sands were encountered below the fill soils, and extended to a depth of about 4½ feet BSG. The clayey sands were underlain by medium dense silty sands extending to a depth of 16½ feet BSG, the maximum depth explored in boring B-2.

14.2 During our April 3, 2020 exploration, groundwater was encountered at the classroom site in borings B-1 and B-2 at depths of 13½ and 16 feet BSG, respectively. The depth of groundwater measured through the augers after drilling boring B-1 was 11 feet BSG.

14.3 The results of liquefaction analyses indicate that liquefaction would occur as a result of the design level seismic event in silty sands at depths between about 13 and 19 feet BSG. The results of the analysis indicate a total seismic settlement of about 2 inches. A differential seismic settlement of about 1 inch in 30 feet is estimated. It has been our experience that total and differential seismic settlements of the magnitude estimated would not preclude the use of a relocatable classroom buildings at the subject site. Tabular and graphical results of the liquefaction analyses are included in Appendix D.

14.4 The Fault Rupture Hazard Update Report prepared by Fugro (Appendix E) concludes that the proposed site for the classroom buildings meets the State of California 50-foot active fault setback requirements.

14.5 Based on the results of our assessment and the investigation conducted by Fugro (refer to Appendix E), no geologic or seismic hazards would be anticipated to have a significant impact on the proposed relocatable classroom site, when designed in accordance with the requirements of the prevailing California Building Code.

15.0 NOTIFICATION AND LIMITATIONS

15.1 The conclusions presented in this report are based on the information provided regarding the proposed construction, and the results of the field and laboratory investigation, combined with interpolation of the subsurface conditions between boring locations.

15.2 The nature and extent of subsurface variations between borings may not become evident until construction.

15.3 If variations or undesirable conditions are encountered during construction, Moore Twining should be notified promptly so that these conditions can be reviewed and the recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

15.4 If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (more than 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions contained in this report should be considered invalid unless the changes are reviewed and our conclusions modified or approved in writing.

15.5 Changed site conditions, or relocation of proposed structures, may require additional field and laboratory investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

15.6 The conclusions contained in this report are valid only for the project discussed in Section 3.3, Anticipated Construction. The use of the information and recommendations contained in this report for structures on this site not discussed herein or for structures on other sites not discussed in Section 3.1, Site Description is not recommended. The entity or entities that use or cause to use this report or any portion thereof for another structure or site not covered by this report shall hold Moore Twining, its officers and employees harmless from any and all claims and provide Moore Twining's defense in the event of a claim.

15.7 This report is issued with the understanding that it is the responsibility of the client to transmit the information of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

15.8 This report presents the results of a geologic and seismic hazard investigation only and should not be construed as a geotechnical report or an environmental audit or study.

15.9 Our professional services were performed, our findings obtained, and our conclusions prepared in accordance with generally-accepted geologic and engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

15.10 This investigation report should not be used in the preparation of a Storm Water Pollution Prevention Plan (SWPPP). Use of this report or any data included in the report in preparation of an SWPPP would be at the owner's sole risk.

15.11 Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site are purchased by another party, the purchaser must obtain written authorization and sign an agreement with Moore Twining in order to rely upon the information provided in this report for design or construction of the project.

We appreciate the opportunity to be of service to the Aromas San Juan Unified School District. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Respectfully Submitted,

MOORE TWINING ASSOCIATES, INC.
Geotechnical Engineering Division

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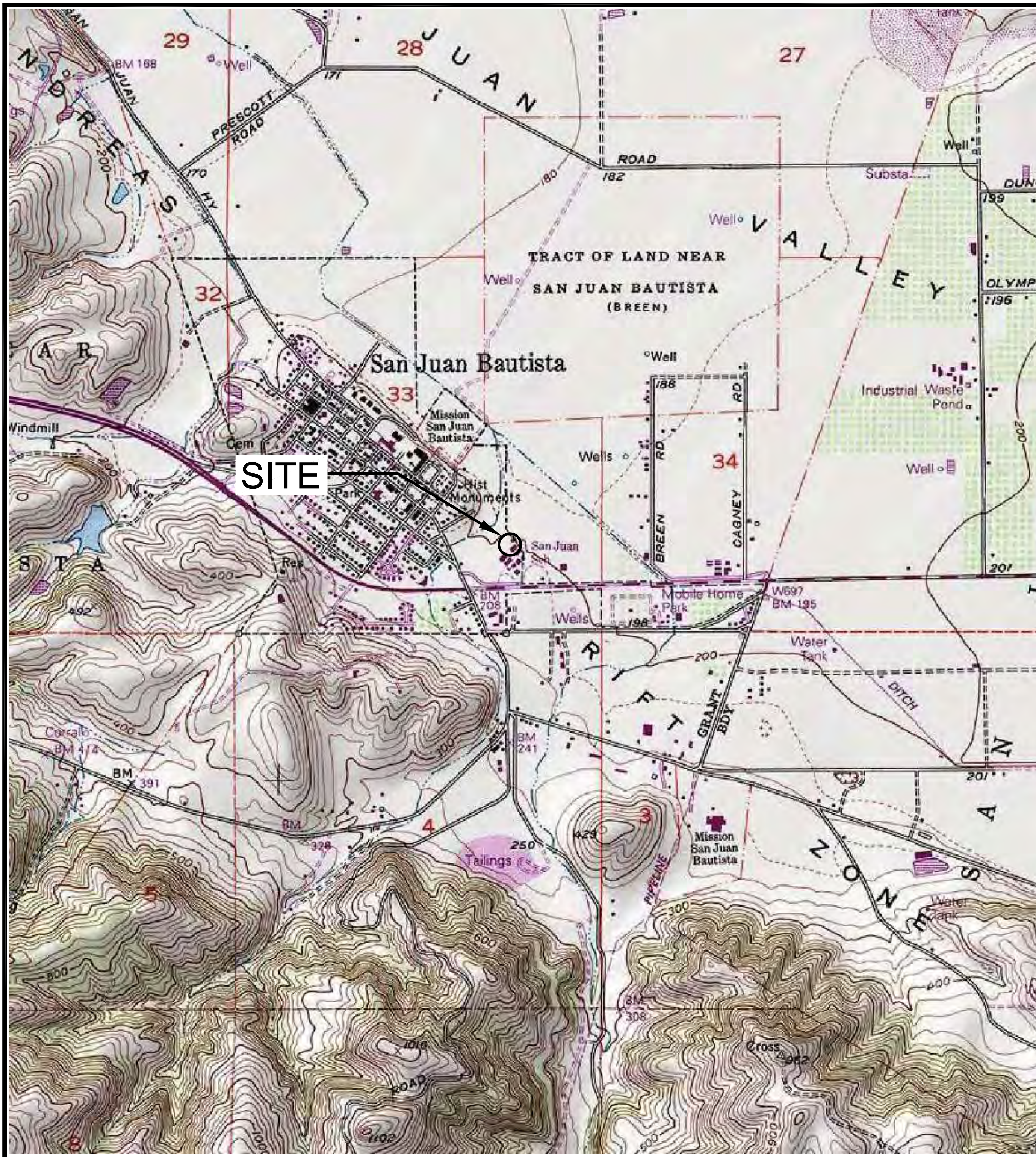
APPENDIX A

DRAWINGS

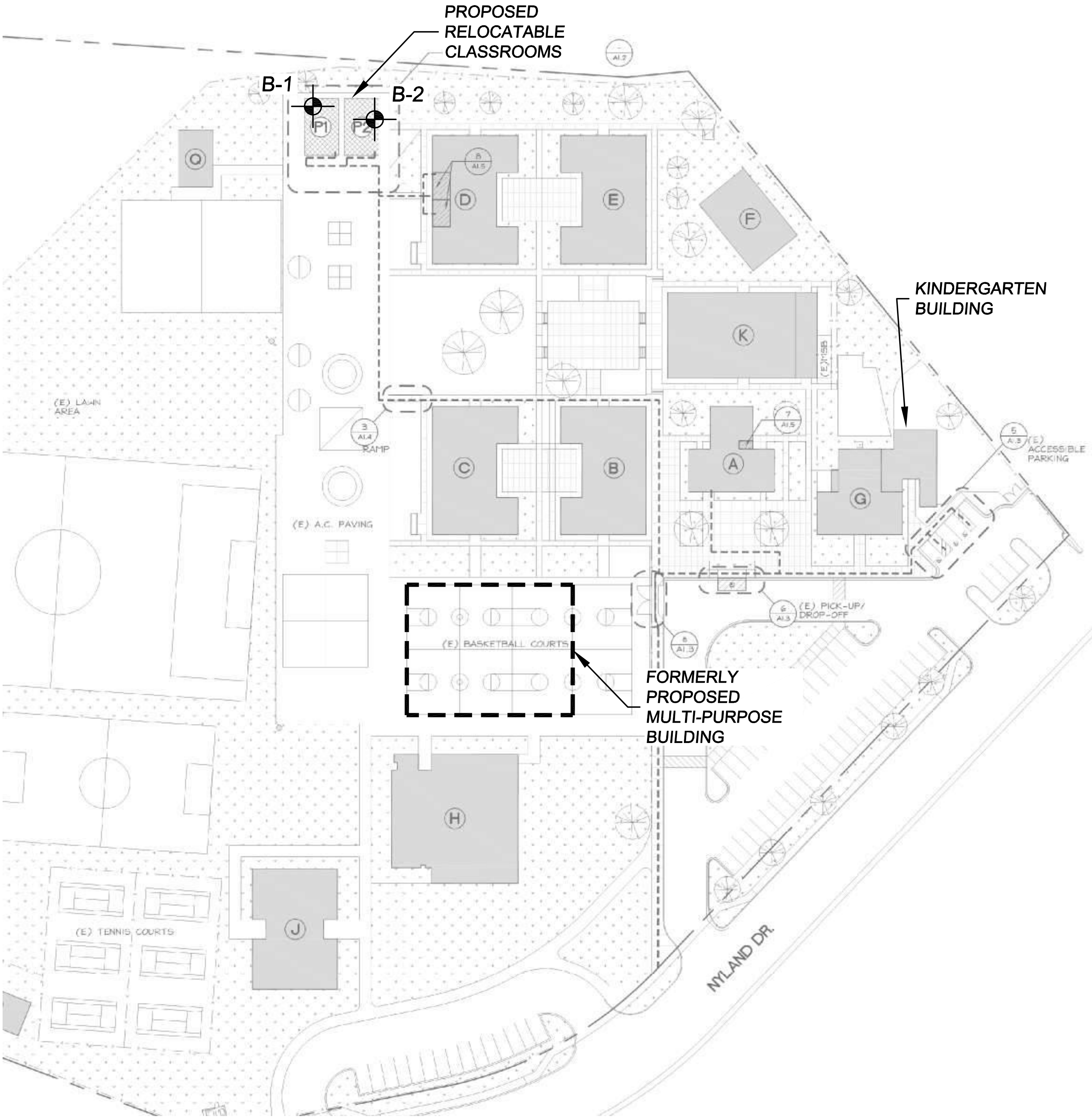


SOURCE: U.S.G.S. TOPOGRAPHIC MAP, 7 ½ MINUTE SERIES
SAN JUAN BAUTISTA, CALIFORNIA QUADRANGLE 1971, PHOTOREVISED 1993

0 2000
APPROXIMATE SCALE
IN FEET

SITE LOCATION MAP SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO.: 83702-02-01 DRAWN BY: RM PROJECT NO. E83701.02	DATE: 04/29/20 APPROVED BY: DRAWING NO. 1

MOORE TWINING ASSOCIATES, INC.



APPROXIMATE TEST BORING LOCATION DRILLED ON APRIL 3, 2020

NOTE: SEE APPENDIX E FOR FAULT TRENCH LOCATIONS

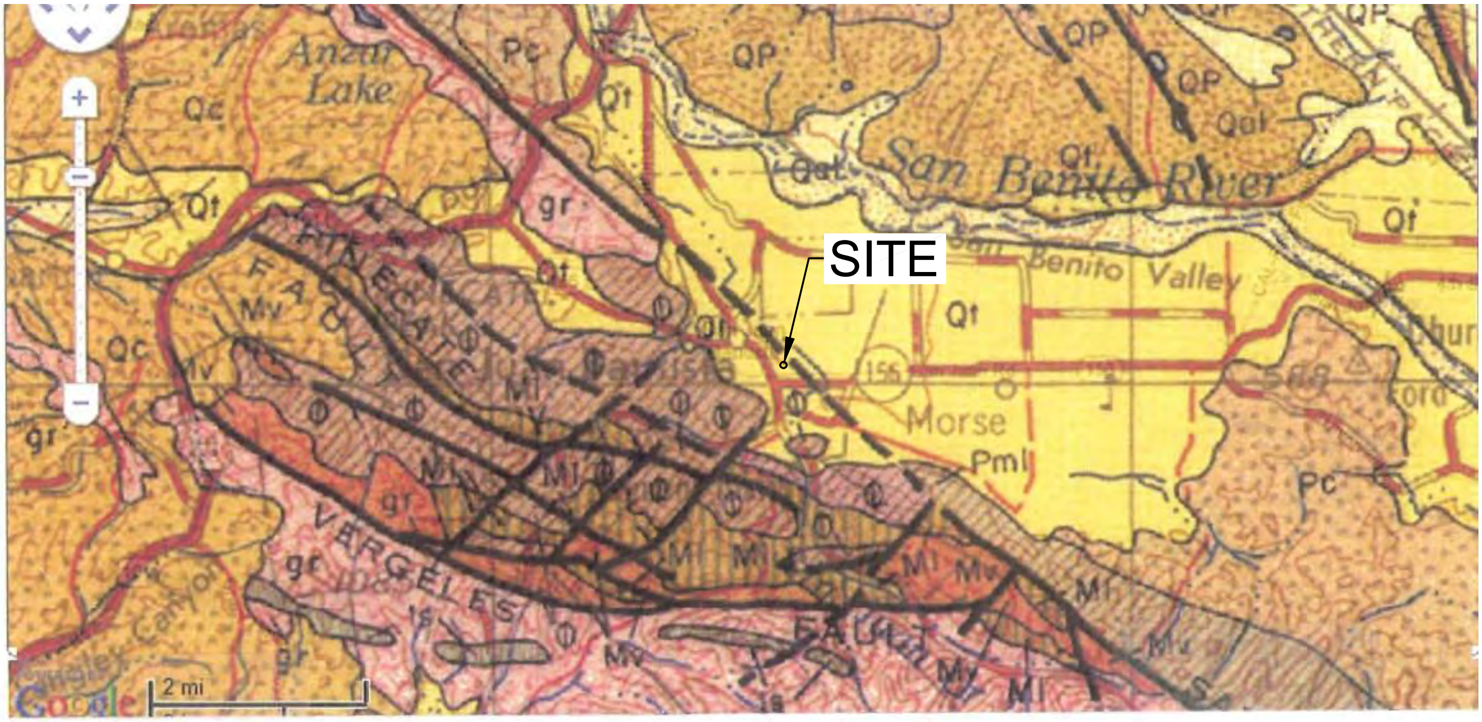
N

0 100

APPROXIMATE SCALE IN FEET

REFERENCE: JOB 19034, OVERALL SITE PLAN, SHEET A1.1
PREPARED BY BELLI ARCHITECTURAL GROUP, DATED 3/17/20

SITE PLAN AND TEST BORING LOCATION MAP SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-02-02	DATE DRAWN: 04/29/20	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.02	DRAWING NO. 2	



GEOLOGIC ATLAS OF CALIFORNIA - SANTA CRUZ SHEET

California Geological Survey, Geologic Atlas of California Map No. 020, 1:250,000 scale

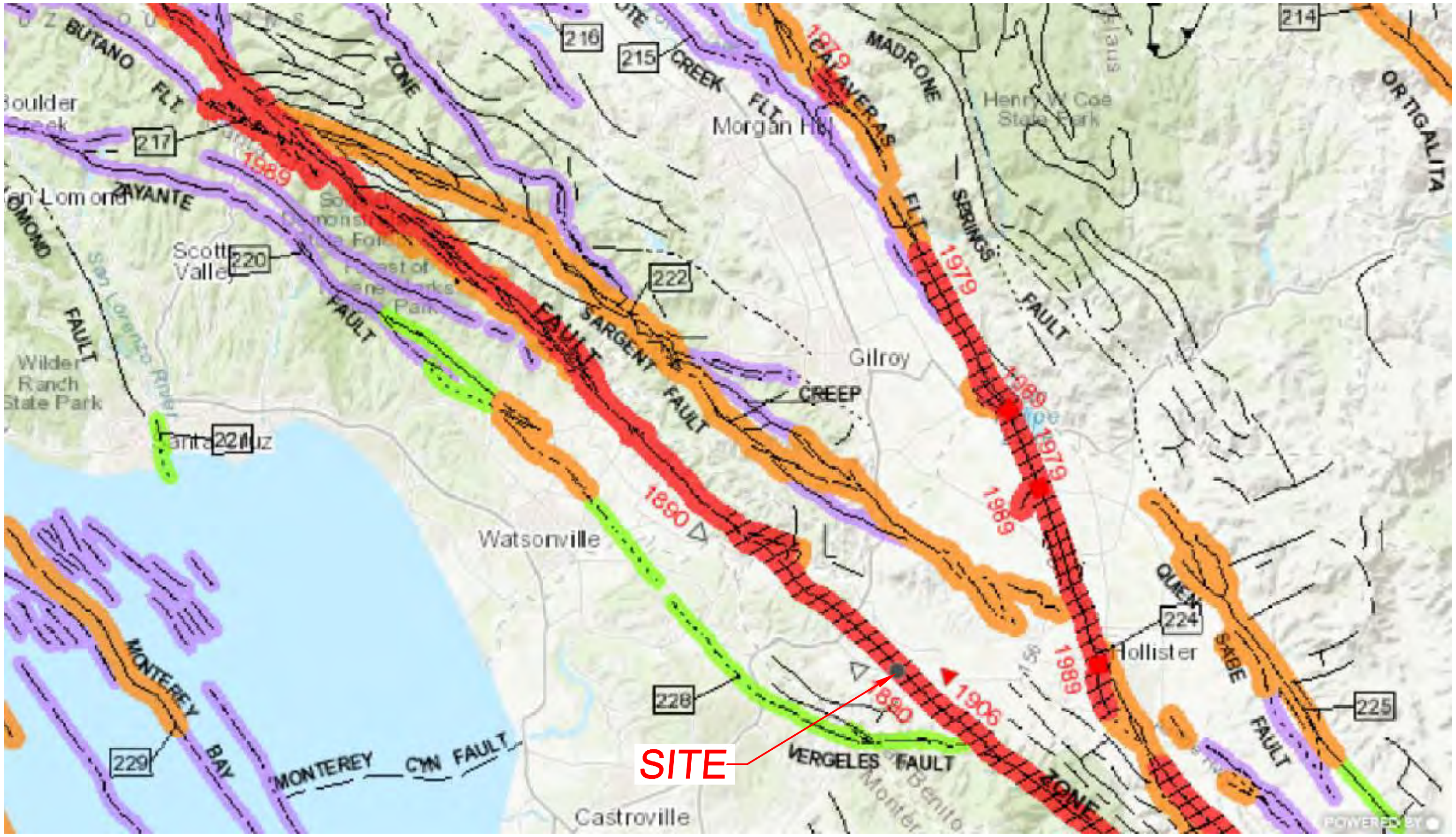
Compilation by: Charles W. Jennings and Rudolph G. Strand

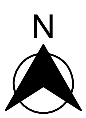
1958

DESCRIPTION OF MAP UNITS

- Qs – Dune sand
- Qal – Alluvium
- Qsc – Stream channel deposits
- Qf – Fan deposits
- Qb – Basin deposits
- Qt – River terrace deposits
- Qm – Pleistocene marine and marine terrace deposits
- Qc – Pleistocene nonmarine
- QP – Plio-Pleistocene nonmarine
- Pc – Undivided Pliocene nonmarine
- Pu – Upper Pliocene marine
- Pmlc – Middle and/or lower Pliocene nonmarine
- Pml – Middle and/or lower Pliocene marine
- Muc – Upper Miocene nonmarine
- Mu – Upper Miocene marine
- Mmc – Middle Miocene nonmarine
- Mm – Middle Miocene marine
- Ml – Lower Miocene marine
- Mv – Miocene volcanic rocks, Mv^r-rhyolite, Mv^a-andesite, Mv^b-basalt, Mv^p-pyroclastic rocks
- Oc – Oligocene nonmarine
- Φ – Oligocene marine
- E – Eocene marine
- Ep – Paleocene marine
- Ti – Tertiary intrusive (hypabyssal) rocks, Ti^r-rhyolite, Ti^a-andesite, Ti^b-basalt
- Ku – Upper Cretaceous marine
- Kl – Lower Cretaceous marine
- KJf – Franciscan group
- KJfv – Franciscan volcanic and metavolcanic rocks
- gr – Mesozoic granitic rocks
- ub – Mesozoic ultrabasic intrusive rocks
- ls – Pre-Cretaceous metamorphic rocks (ls=limestone)

REGIONAL GEOLOGIC MAP SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-02-02	DATE DRAWN: 04/29/20	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.02	DRAWING NO. 3	





REFERENCE: JENNINGS, CW., AND BRYAND, W.A., 2010
FAULT ACTIVITY MAP OF CALIFORNIA: CALIFORNIA
GEOLOGICAL SURVEY, GEOLOGIC DATA MAP NO. 6

LEGEND

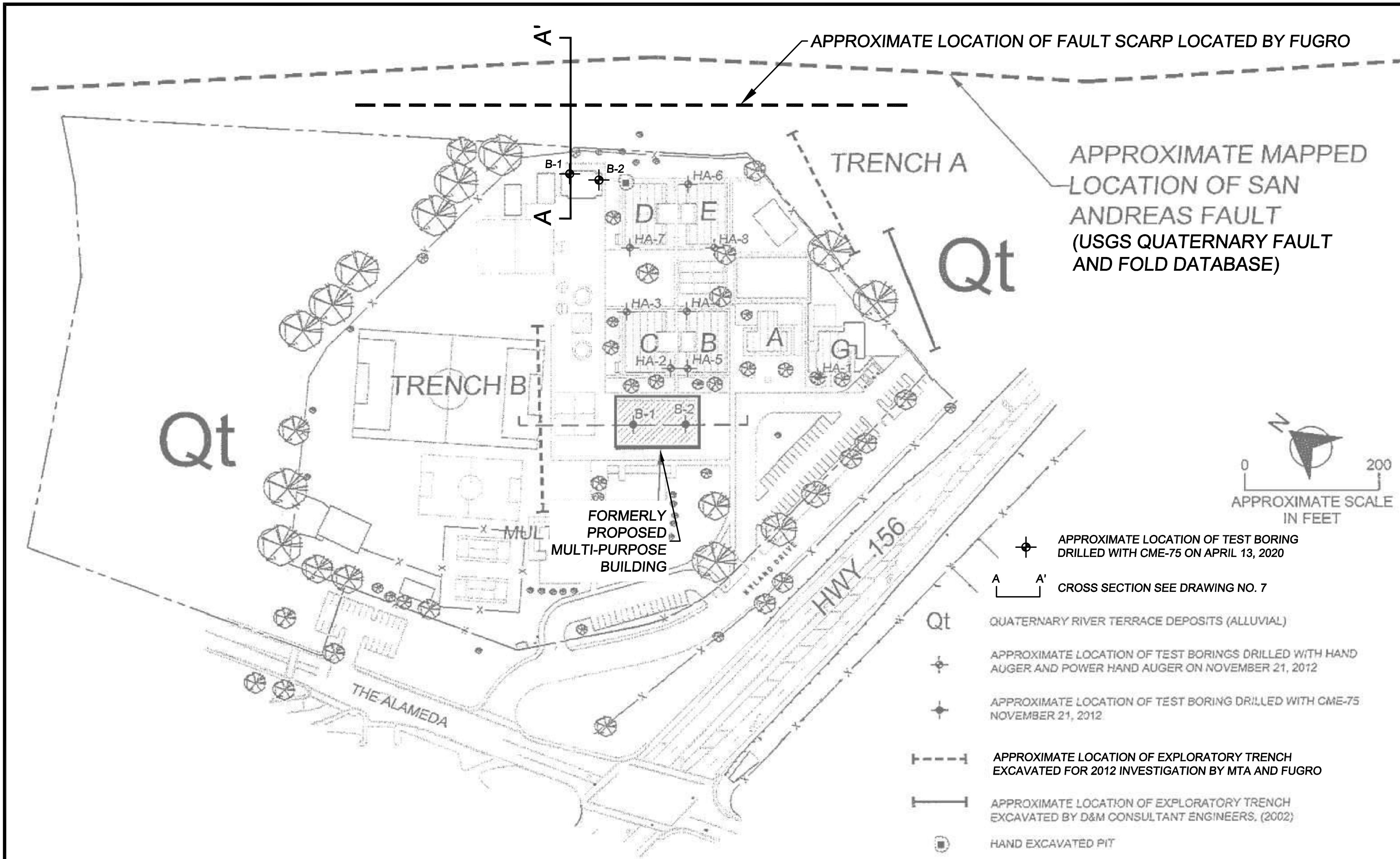
- *Fault along which historic (last 200 years) displacement has occurred*
- *Holocene fault displacement (during past 11,700 years) without historic record*
- *Late Quaternary fault displacement (during past 700,000 years)*
- *Quaternary fault (age undifferentiated)*

MAP OF ACTIVE AND POTENTIALLY ACTIVE FAULTS RELATIVE TO SITE SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-02-02	DATE DRAWN: 04/29/20
	DRAWN BY: RM	APPROVED BY:
	PROJECT NO. A27362.01	DRAWING NO. 4

MOORE TWINING ASSOCIATES, INC.
Since 1898

HISTORICAL EARTHQUAKE EPICENTER MAP SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-02-02	DATE DRAWN: 04/29/20
	DRAWN BY: RM	APPROVED BY:
	PROJECT NO. A27362.01	DRAWING NO. 5

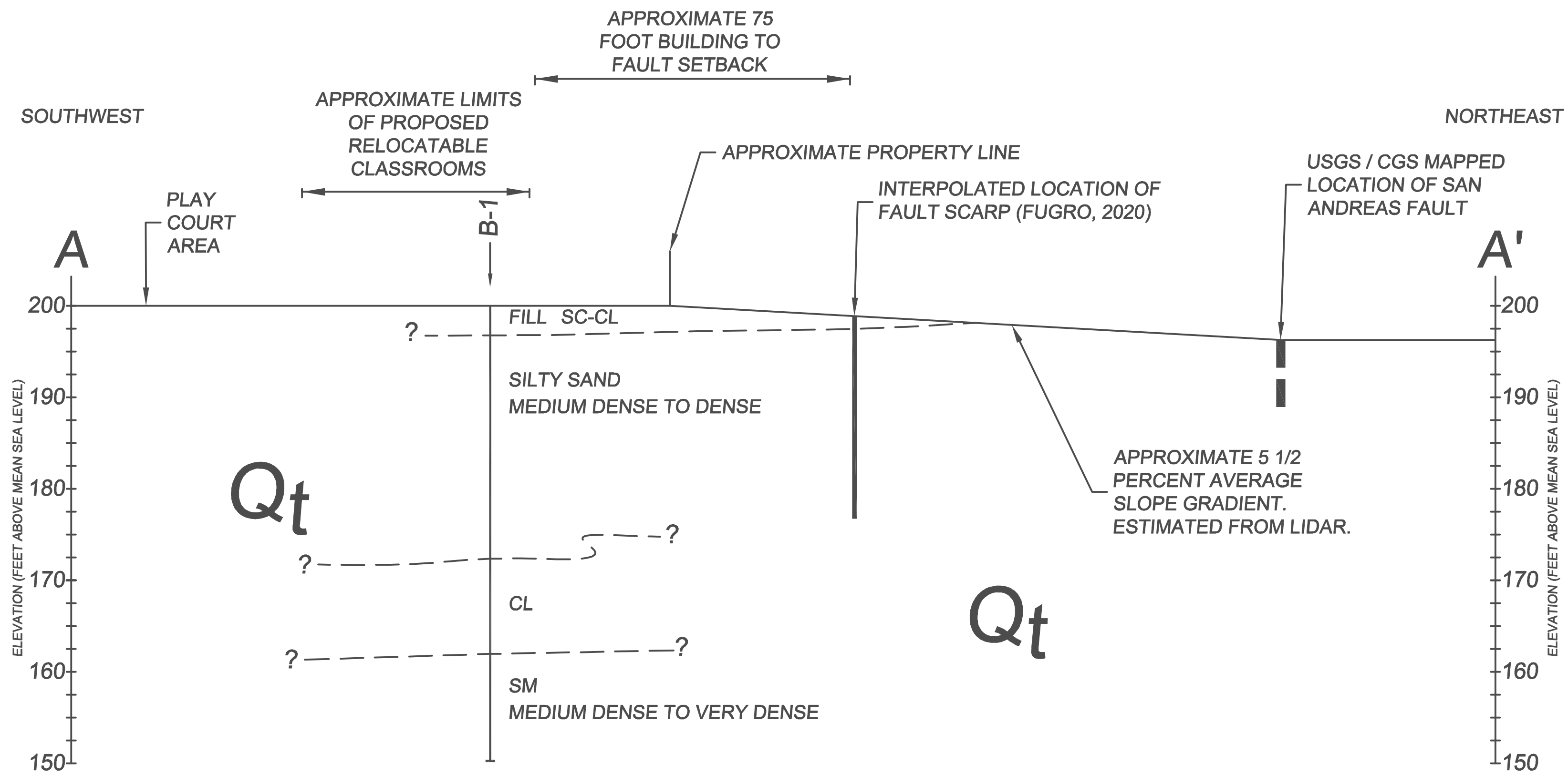
MOORE TWINING ASSOCIATES, INC.



SOURCE: KASAVAN ARCHITECTS, SAN JUAN SCHOOL, SHEET A1.1, DATED 8/10/2011

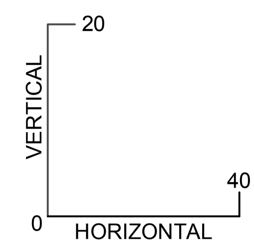
SITE GEOLOGIC MAP SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-02-02	DATE DRAWN: 04/29/20
	DRAWN BY: RM	APPROVED BY:
	PROJECT NO. A27362.01	DRAWING NO. 6

MOORE TWINING ASSOCIATES, INC.



Q_t: QUATERNARY RIVER TERRACE DEPOSITS

FILL: FILL SOILS ENCOUNTERED IN BORINGS AND DESCRIBE IN FUGRO 2020
SM: SILTY SAND
SC: CLAYEY SAND
CL: SAND LEAN CLAY



APPROXIMATE SCALE
IN FEET

GEOLOGIC SOIL PROFILE CROSS SECTION A-A' SAN JUAN SCHOOL RELOCATABLE CLASSROOMS 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-02-02	DATE DRAWN: 04/29/20
	DRAWN BY: RM	APPROVED BY:
	PROJECT NO. A27362.01	DRAWING NO. 7

MOORE TWINING ASSOCIATES, INC.

APPENDIX B

LOGS OF BORINGS

This appendix contains the final logs of borings. These logs represent our interpretation of the contents of the field logs and the results of the field and laboratory tests.

The logs and related information depict subsurface conditions only at these locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these test boring locations. Also, the passage of time may result in changes in the soil conditions at these test boring locations.

In addition, an explanation of the abbreviations used in the preparation of the logs and a description of the Unified Soil Classification System are provided at the end of Appendix B.

MOORE TWINING ASSOCIATES, INC.

Test Boring: B-1

Project: Proposed Relocatable Classrooms

Project Number: E83701.02

Drilled By: MTA

Drill Type: CME 75

Auger Type: 6-5/8" Hollow Stem Augers

Hammer Type: 140 Auto Trip Hammer

Logged By: J.C.

Date: April 3, 2020

Elevation: 200 feet AMSL (Approx)

Depth to Groundwater First Encountered During Drilling: 13.5 feet

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
200 – 0		AC	ASPHALTIC CONCRETE = 2 INCHES THICK			
		AB	AGGREGATE BASE = 4 INCHES THICK			
	3/6 6/6 11/6	FILL	FILL - CLAYEY SAND; moist, brown, easy to hand auger	At 1-3': -#200=47.5% SAND=50.6% +#4=1.9% PI=19 LL=34	17	12.5
195 – 5		SM	SILTY SAND; medium dense, moist, fine to medium grained, brown			
190 – 10	7/6 20/6 23/6		Dense, medium to coarse grained	DD=114.6 pcf -#200=12.6% SAND=80.4% +#4=7.0%	43	
185 – 15	2/6 3/6 6/6		Loose, wet, red-brown to brown, 2 inch seam of clay		9	
180 – 20	6/6 8/6 7/6		medium dense, very moist, dark-brown to black, increase in fines content with depth	-#200=37.1% SAND=60.4% +#4=2.4% PI=NP LL-NV	15	
175 – 25	4/6 12/6 17/6		wet, medium to coarse grained, brown to tan brown		29	

Notes: *Groundater encountered at a depth of 13.5 feet during drilling. Groundwater measured through the augers at a depth of 11 feet after drilling.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: B-1

Project: Proposed Relocatable Classrooms

Project Number: E83701.02

Drilled By: MTA

Drill Type: CME 75

Auger Type: 6-5/8" Hollow Stem Augers

Hammer Type: 140 Auto Trip Hammer

Logged By: J.C.

Date: April 3, 2020

Elevation: 200 feet AMSL (Approx)

Depth to Groundwater First Encountered During Drilling: 13.5 feet

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
170 — 30	5/6 3/6 8/6	CL	SANDY LEAN CLAY; stiff, moist, medium plasticity, olive-green, increase in sand content with depth	PI=19 LL=34	11	
165 — 35	13/6 6/6 12/6		Very stiff 8 inch sand layer		18	
160 — 40	6/6 12/6 12/6	SM	SILTY SAND; medium dense, moist, medium to coarse grained, brown	-#200=26.4% SAND=71.1% +%4=2.5%	24	
155 — 45	17/6 31/6 30/6		Very dense, brown to red-brown, trace gravel		61	
150 — 50	27/6 15/6 31/6		Dense, fine to coarse grained		46	
			Bottom of boring B-1 at 50 feet BSG			
145 — 55						

Notes: *Groundater encountered at a depth of 13.5 feet during drilling. Groundwater measured through the augers at a depth of 11 feet after drilling.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: B-2

Project: Proposed Relocatable Classrooms

Project Number: E83701.02

Drilled By: J.C.

Drill Type: CME 75

Auger Type: 6-5/8" Hollow Stem Augers

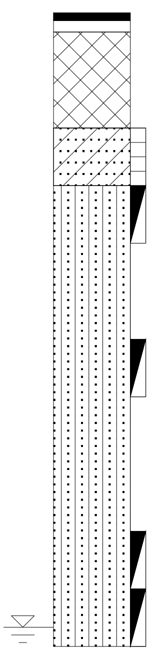
Hammer Type: 140 Auto Trip Hammer

Logged By: Z.A.

Date: April 3, 2020

Elevation: 200 feet AMSL (Approx)

Depth to Groundwater First Encountered During Drilling: 16 feet



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
200 — 0		AC	ASPHALTIC CONCRETE = 2.5 INCHES THICK			
		AB	AGGREGATE BASE = 4.0 INCHES THICK			
	5/6 7/6 13/6	FILL	FILL - SANDY LEAN CLAY; moist, low plasticity, brown	DD=118.8 pcf	20	8.7
195 — 5	4/6 3/6 9/6	SC	CLAYEY SAND; medium dense, moist, fine to coarse grained, brown, trace fine gravel		12	
	5/6 6/6 7/6	SM	SILTY SAND; medium dense, moist fine to coarse grained, trace fine gravel		13	
190 — 10			Increase in fine sand			
	4/6 6/6 10/6		Seams of clay, increase in coarse sand	-#200=38.6% SAND=59.8% +#4=1.6% PI=NP LL=NV	16	
185 — 15	6/6 7/6 4/6		Olive-green		11	
			Bottom of boring B-2 at 16.5 feet BSG			
180 — 20						
175 — 25						

Notes:

Figure Number

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	ASPHALTIC CONCRETE
	Blank
	Fill
	SM: Silty sand
	CL: LEAN CLAY
	SC: Clayey sand
Misc. Symbols	
	Water table during drilling
	Boring continues
Soil Samplers	
	California Modified split barrel ring sampler

Notes:

1. Test borings were drilled on April 3rd, 2020, using a CME-75 drill rig equipped with 6-5/8 inch outside diameter hollow-stem augers.

2. Groundwater was encountered in the borings (see boring logs).

3. Boring locations were located by pace and tape measure with reference to the existing site features.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. The "N-value" reported for the California Modified Split Barrel Sampler is the uncorrected field blow count. This value should not be interpreted as an SPT equivalent N-value.

6. Results of tests conducted on samples recovered are reported on the logs. Abbreviations used are:

AMSL =	Above mean sea level
O.D. =	Outside diameter
DD =	Dry density (pcf)
-#200 =	Percent passing #200 sieve (%)
N/A =	Not applicable
N/E =	None encountered
pcf =	pounds per cubic foot
psf =	pounds per square foot
BSG =	below site grade
LL =	Liquid Limit
PI =	Plasticity Index
C =	Cohesion
ø =	Angle of Internal Friction
NV =	No Value
NP =	Non Plastic

KEY TO SYMBOLS

Symbol **Description**

Soil Samplers

 **Standard penetration test**

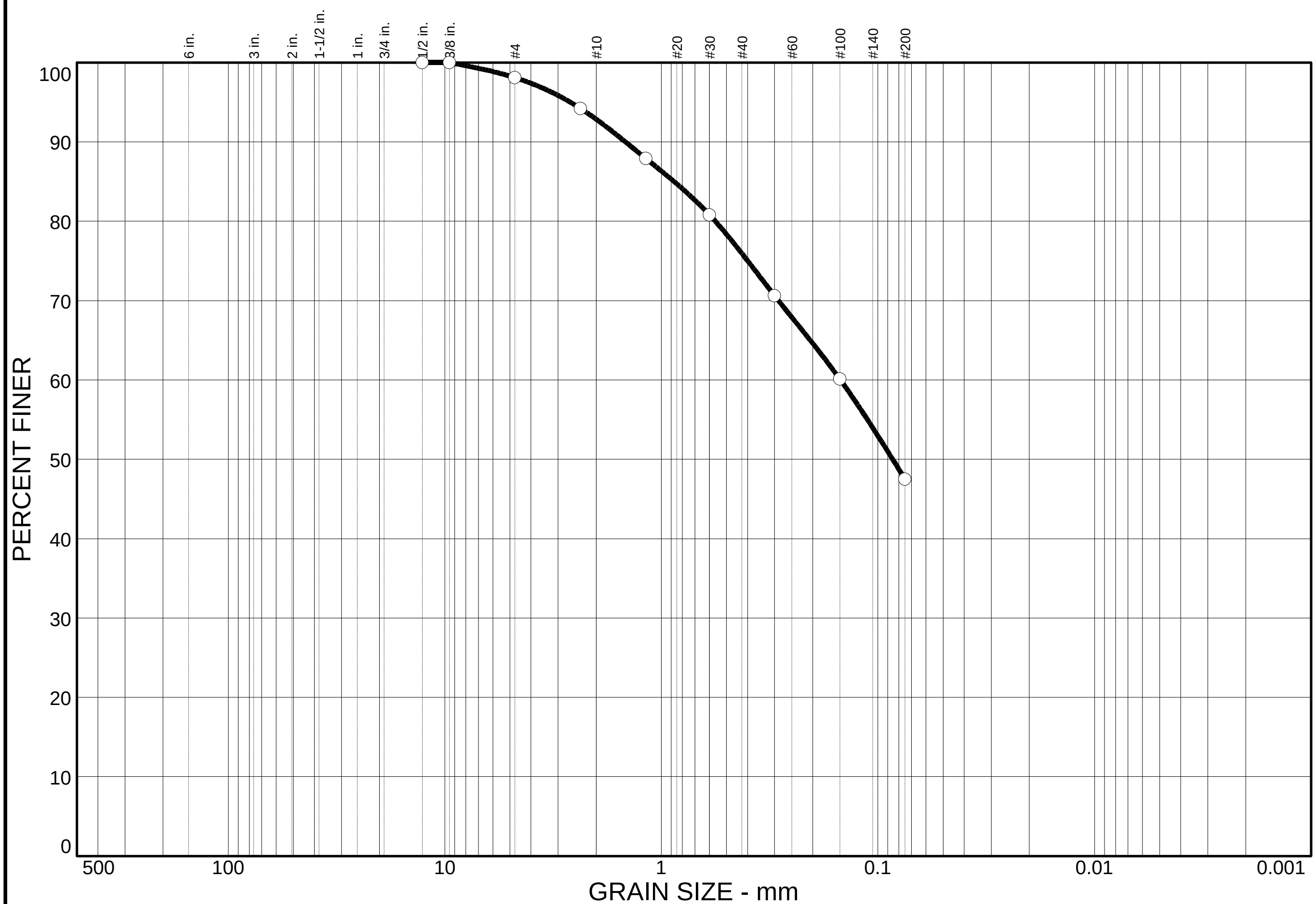
APPENDIX C

RESULTS OF LABORATORY TESTS

This appendix contains the individual results of the following tests. The results of the moisture content and dry density tests are included on the test boring logs in Appendix B. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

These Included:	To Determine:
Moisture Content (ASTM D2216)	Moisture contents representative of field conditions at the time the sample was taken.
Dry Density (ASTM D2937)	Dry unit weight of sample representative of in-situ or in-place undisturbed condition.
Grain-Size Distribution (ASTM D422)	Size and distribution of soil particles, i.e., clay, silt, sand, and gravel.
Atterberg Limits (ASTM D4318)	Determines the moisture content where the soil behaves as a viscous material (liquid limit) and the moisture content at which the soil reaches a plastic state

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.9	50.6	47.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.1		
#8	94.2		
#16	87.9		
#30	80.8		
#50	70.6		
#100	60.1		
#200	47.5		

* (no specification provided)

Material Description

Clayey sand

Atterberg Limits

PL= 15 LL= 34 PI= 19

Coefficients

D_{85}= 0.874 D_{60}= 0.149 D_{50}= 0.0855
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO=

Remarks

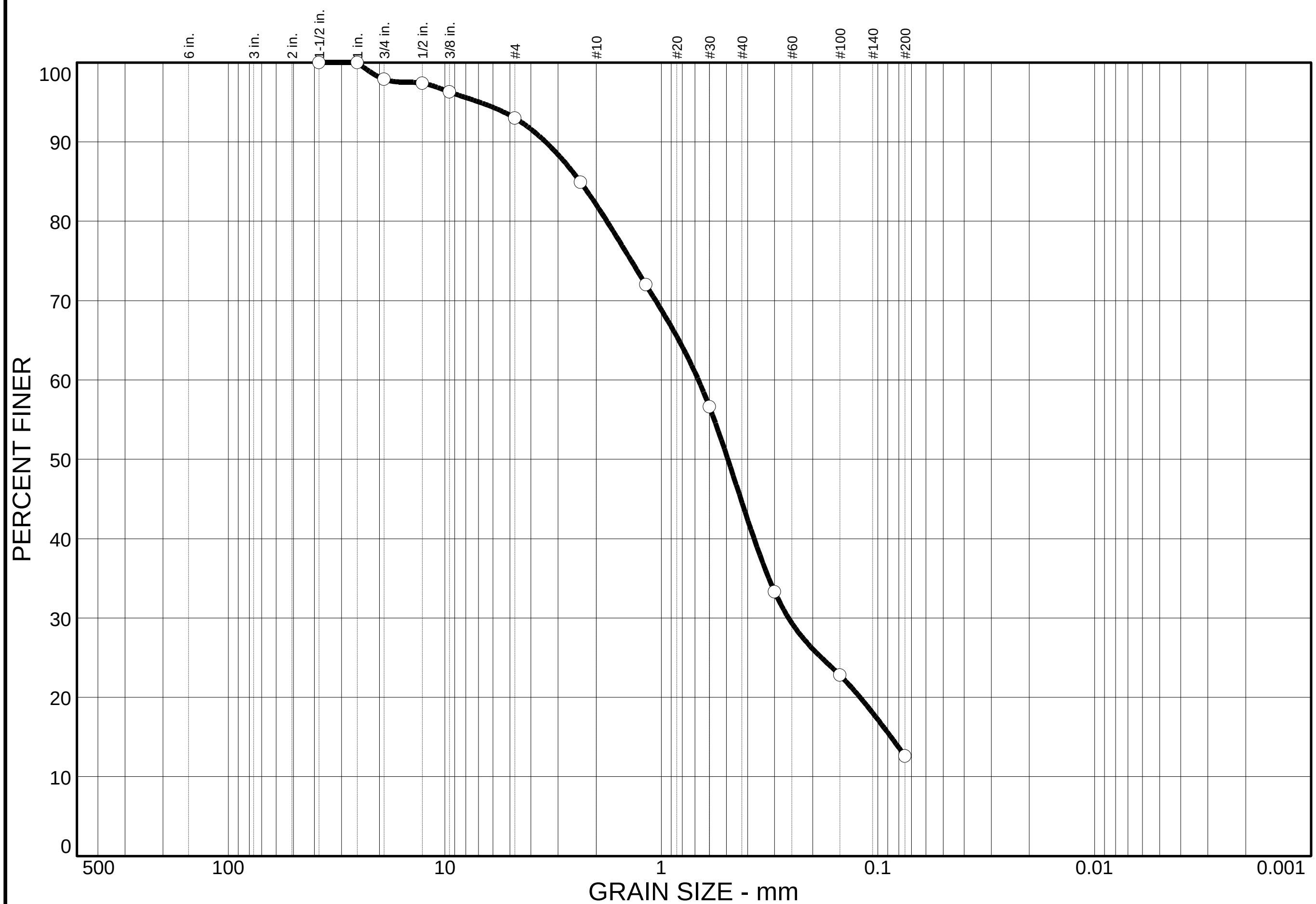
Sample No.: P-1 **Source of Sample:** **Date:** 4/3/20
Location: **Elev./Depth:** 1-3'

Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Proposed Relocateable Classrooms
Project No: E83701.02 **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.0	80.4	12.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2 in.	100.0		
1 in.	100.0		
3/4 in.	97.9		
1/2 in.	97.4		
3/8 in.	96.3		
#4	93.0		
#8	84.9		
#16	72.0		
#30	56.6		
#50	33.3		
#100	22.8		
#200	12.6		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.37 D_{60}= 0.675 D_{50}= 0.494
D_{30}= 0.259 D_{15}= 0.0871 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: P-1 **Source of Sample:** **Date:** 4/3/20
Location: **Elev./Depth:** 8.5-10'

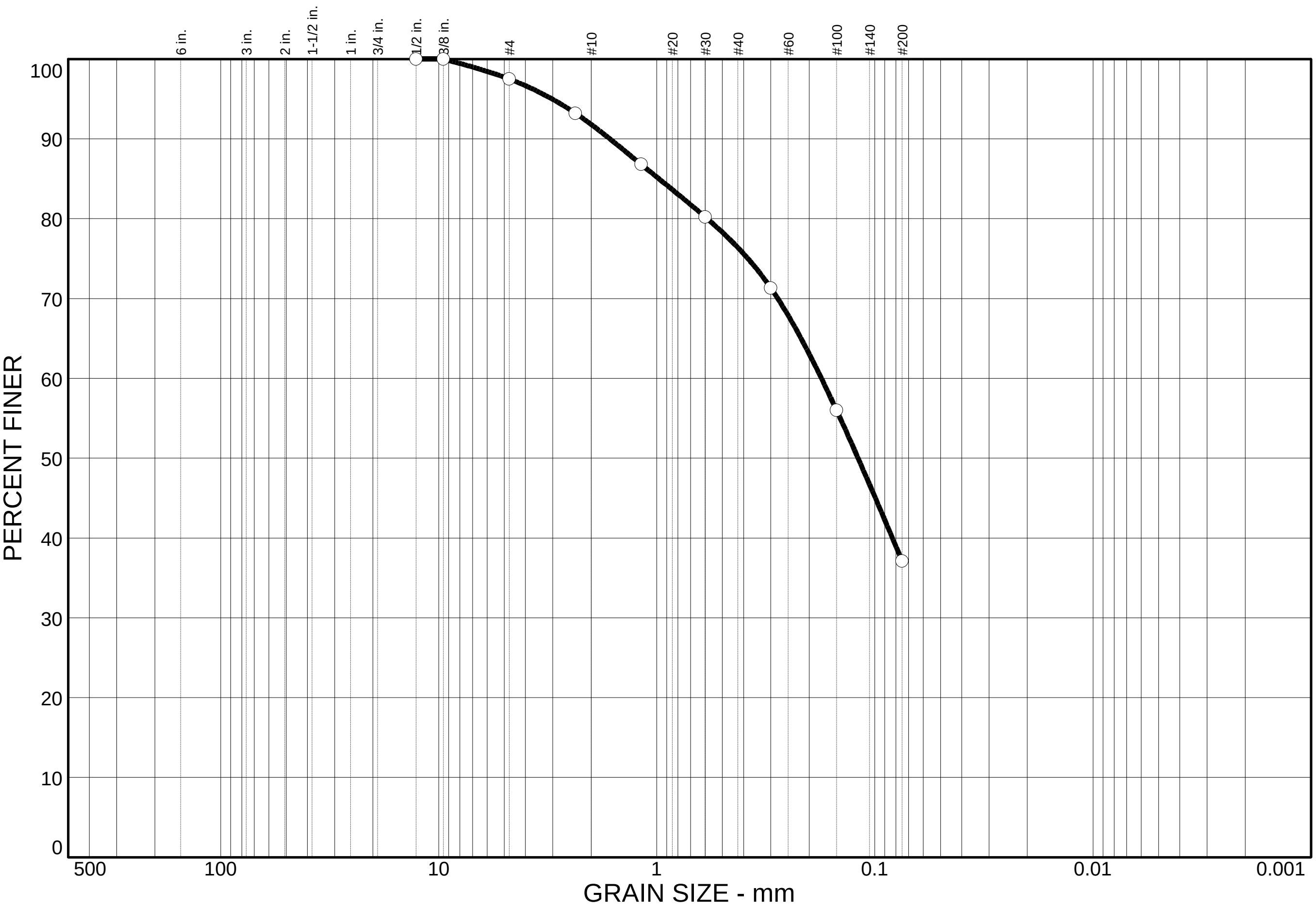
Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Proposed Relocateable Classrooms

Project No: E83701.02 **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.5	60.4	37.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	97.5		
#8	93.2		
#16	86.8		
#30	80.2		
#50	71.3		
#100	56.0		
#200	37.1		

* (no specification provided)

Material Description

Silty sand

Atterberg Limits

PL= NP   LL= NV   PI= NP

Coefficients

D_{85}= 0.979 D_{60}= 0.176 D_{50}= 0.119
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM   AASHTO=

Remarks

Sample No.: P-1   **Source of Sample:**   **Date:** 4/3/20
Location: **Elev./Depth:** 18.5-20'

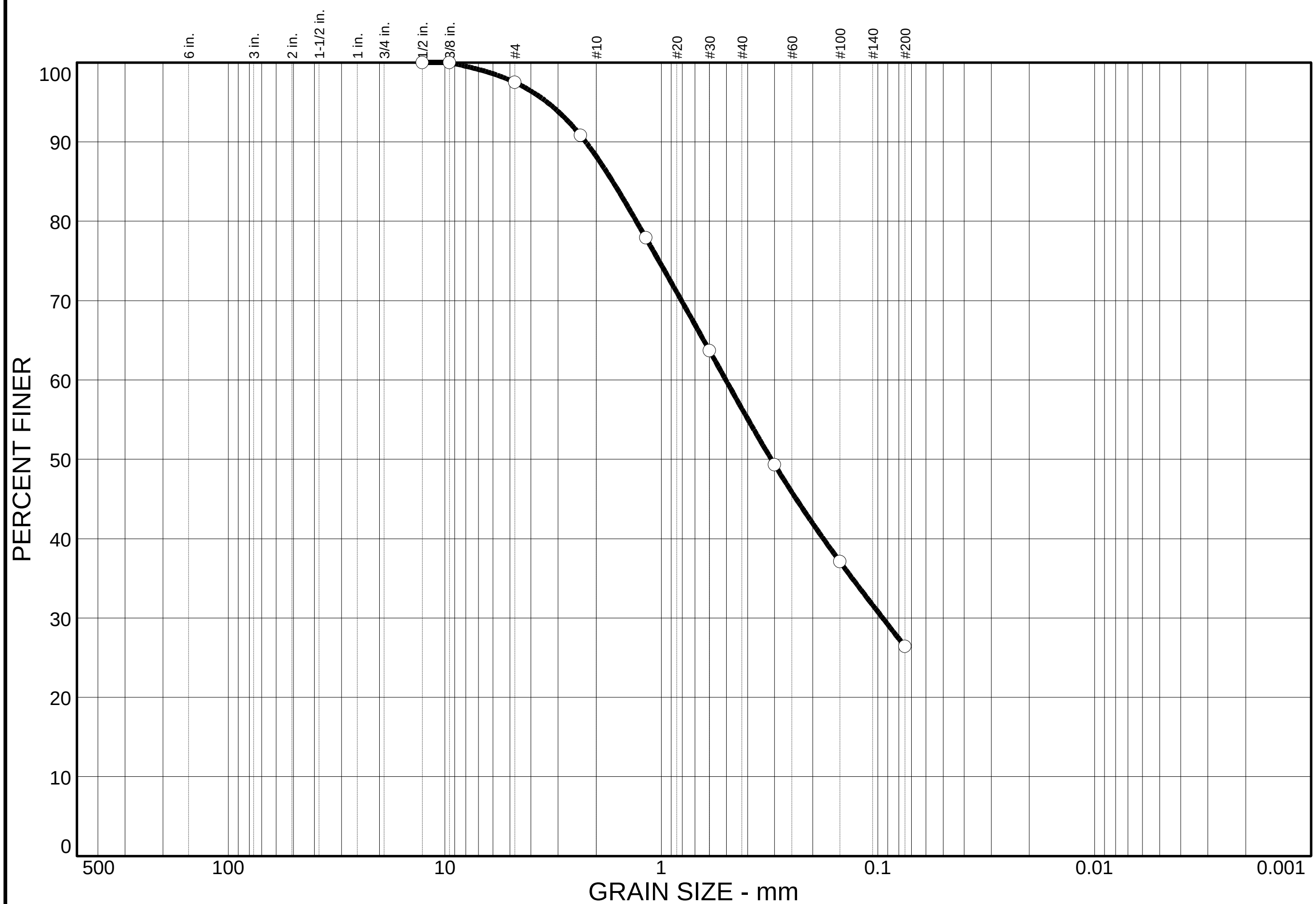
Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Proposed Relocateable Classrooms

Project No: E83701.02   **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.5	71.1	26.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	97.5		
#8	90.8		
#16	77.9		
#30	63.7		
#50	49.3		
#100	37.1		
#200	26.4		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.68 D_{60}= 0.504 D_{50}= 0.311
D_{30}= 0.0952 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

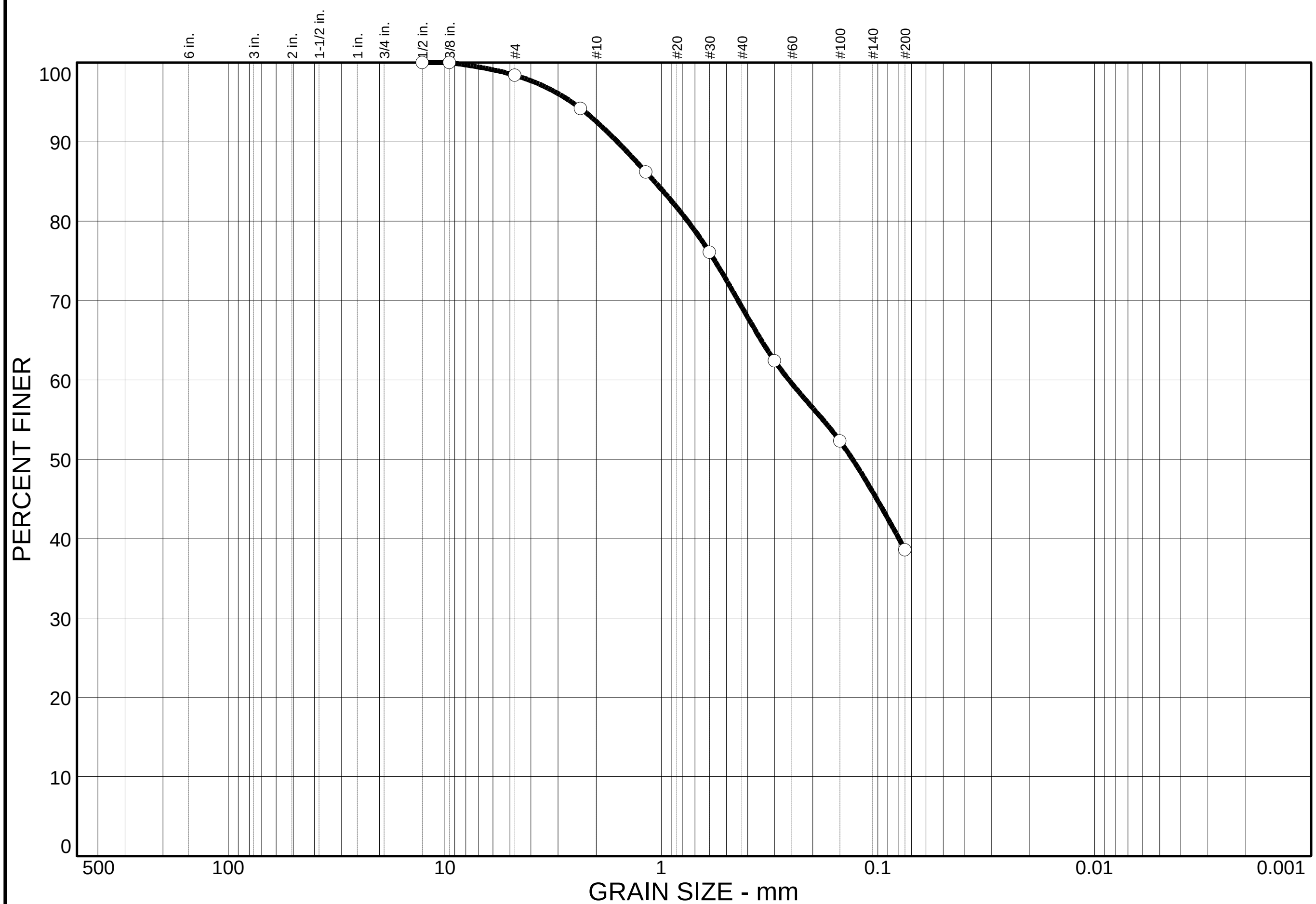
Sample No.: P-1 **Source of Sample:** **Date:** 4/3/20
Location: **Elev./Depth:** 38.5-40'

Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Proposed Relocateable Classrooms
Project No: E83701.02 **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.6	59.8	38.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.4		
#8	94.2		
#16	86.2		
#30	76.1		
#50	62.4		
#100	52.3		
#200	38.6		

* (no specification provided)

Material Description

Silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{85}= 1.08 D_{60}= 0.258 D_{50}= 0.131
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

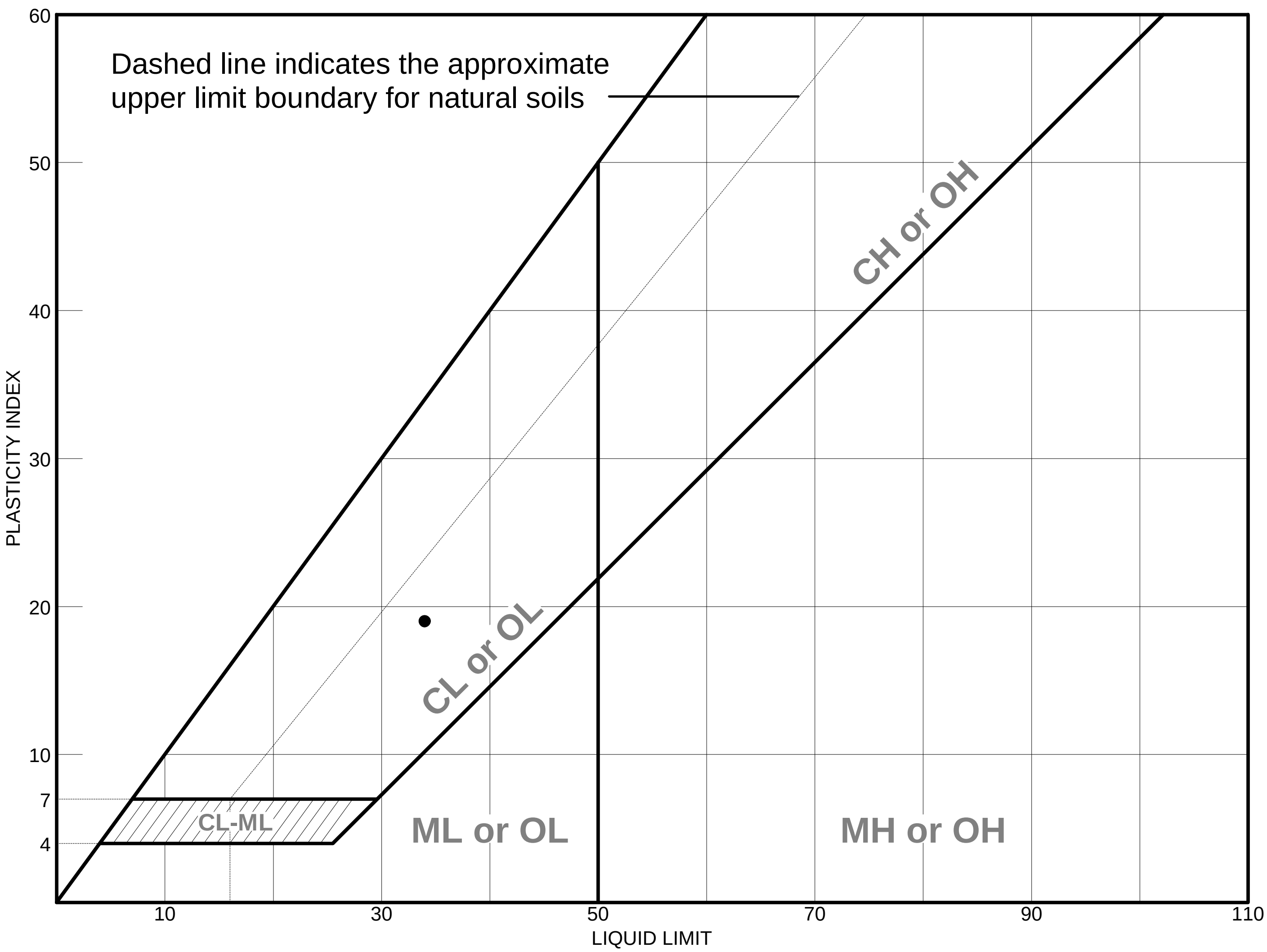
Sample No.: P-2 **Source of Sample:** **Date:** 4/3/20
Location: **Elev./Depth:** 13.5-15'

Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Proposed Relocateable Classrooms
Project No: E83701.02 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey sand	34	15	19	75.9	47.5	SC

Project No. E83701.02 **Client:**

Project: Proposed Relocateable Classrooms

● **Source:** **Sample No.:** P-1 **Elev./Depth:** 1-3'

Remarks:

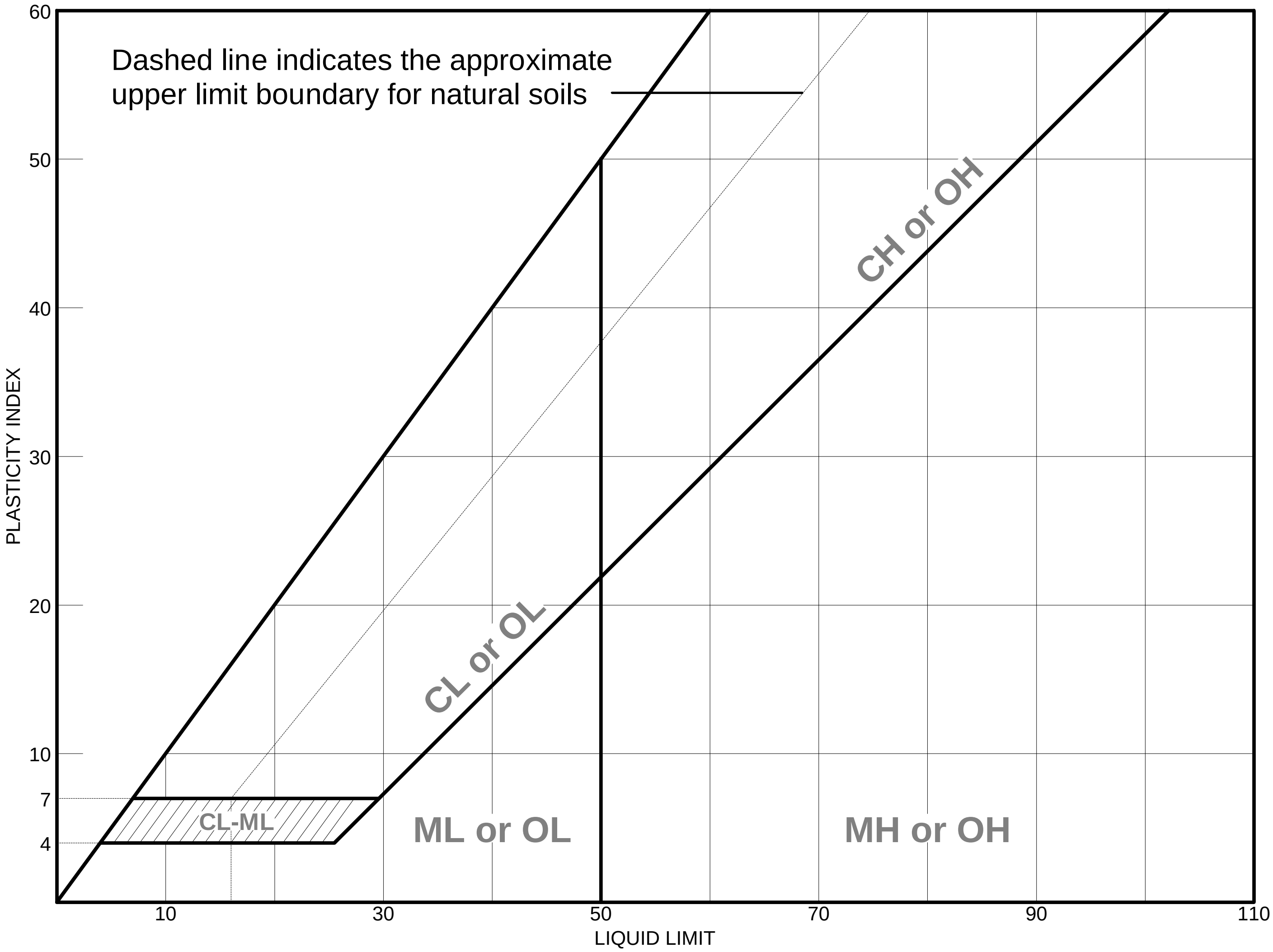
●

Moore Twining Associates, Inc.

Fresno, CA

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty sand	NV	NP	NP	76.4	37.1	SM

Project No. E83701.02 **Client:**

Project: Proposed Relocateable Classrooms

● **Source:** **Sample No.:** P-1 **Elev./Depth:** 18.5-20'

Remarks:

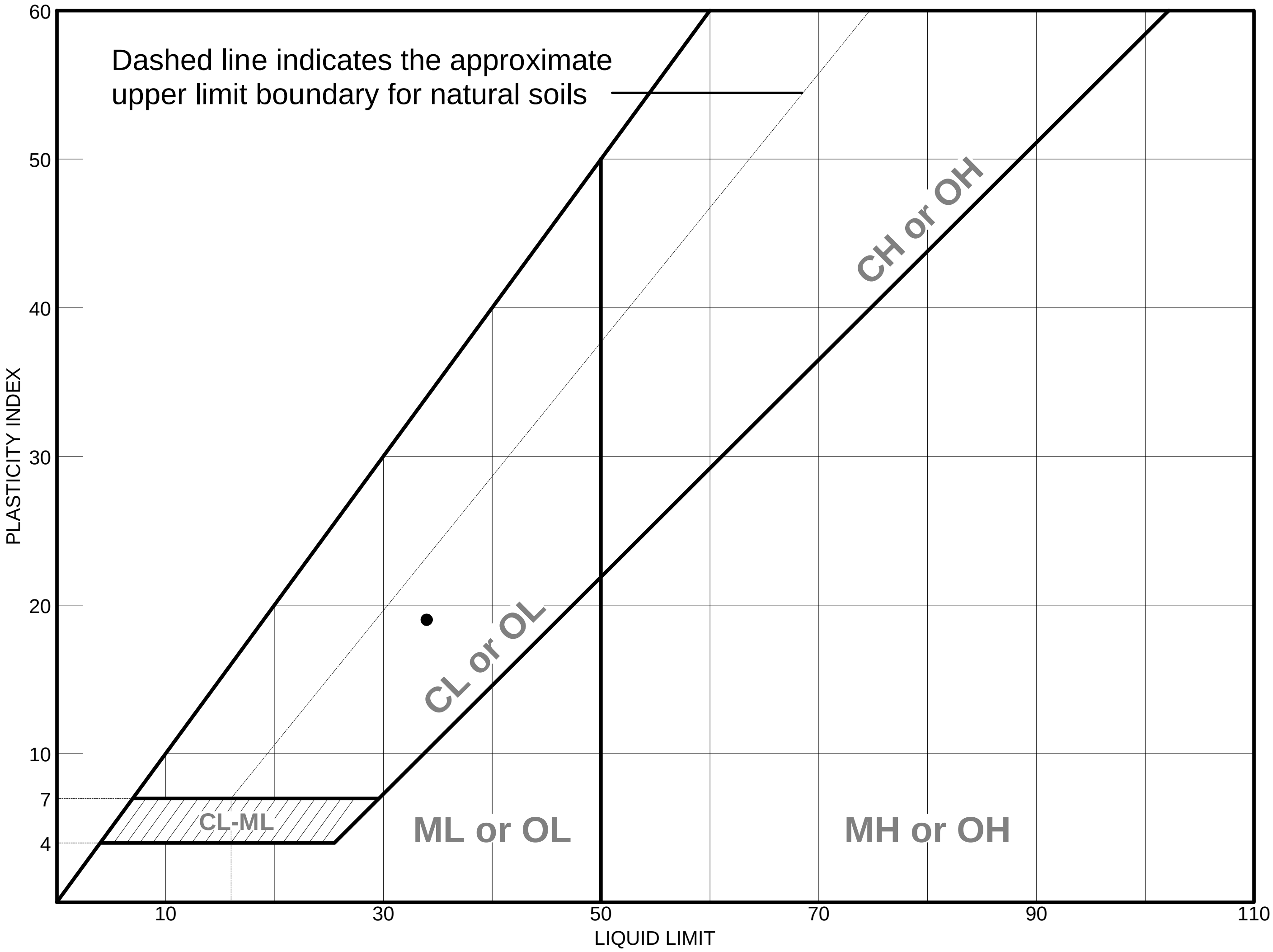
●

Moore Twining Associates, Inc.

Fresno, CA

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey sand	34	15	19			SC

Project No. E83701.02 **Client:**

Project: Proposed Relocateable Classrooms

● **Source:** **Sample No.:** P-1 **Elev./Depth:** 28.5-30'

Remarks:

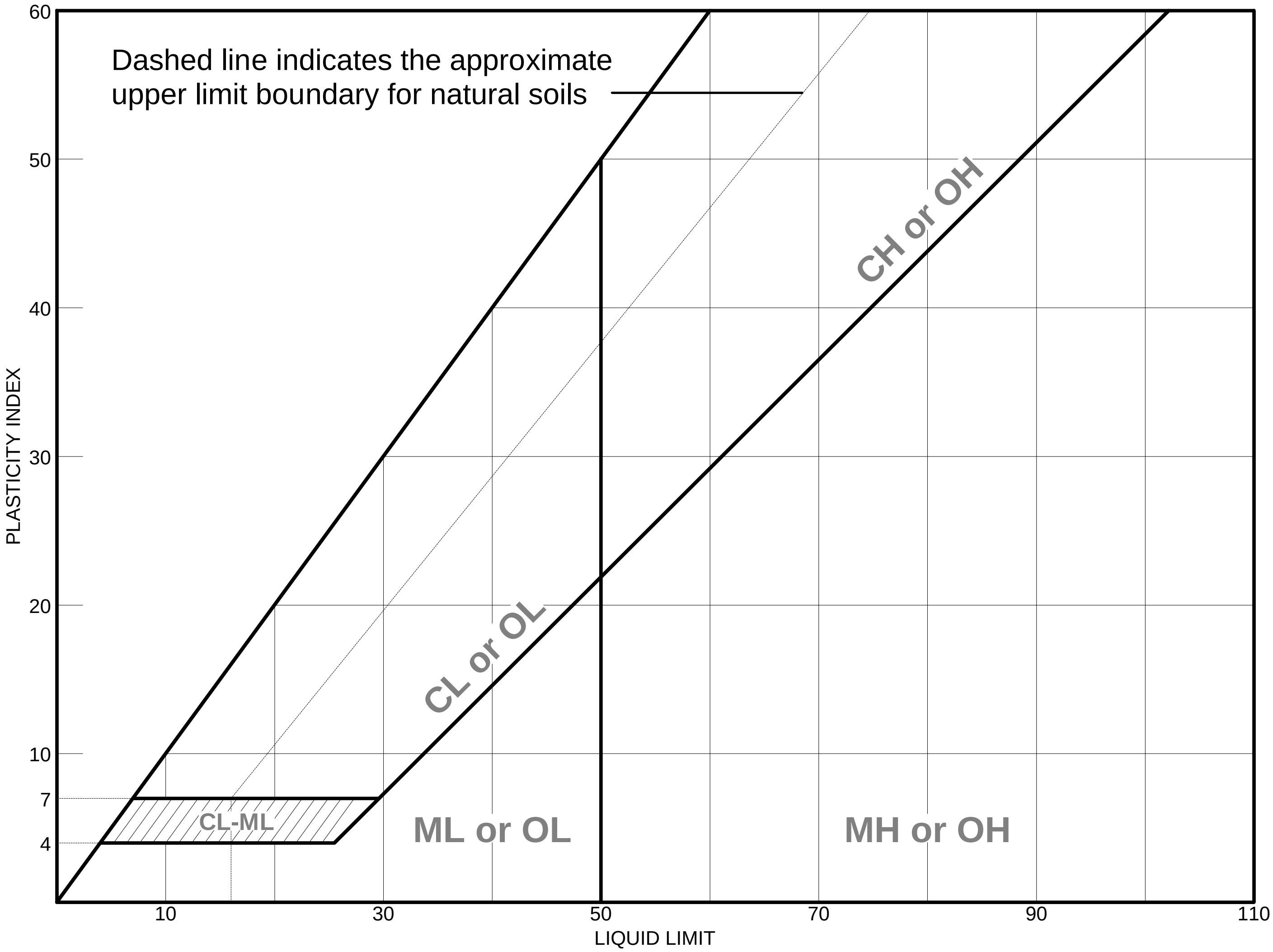
●

Moore Twining Associates, Inc.

Fresno, CA

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty sand	NV	NP	NP	69.2	38.6	SM

Project No. E83701.02 **Client:**

Project: Proposed Relocateable Classrooms

● **Source:** **Sample No.:** P-2 **Elev./Depth:** 13.5-15'

Remarks:

●

Moore Twining Associates, Inc.

Fresno, CA

Figure

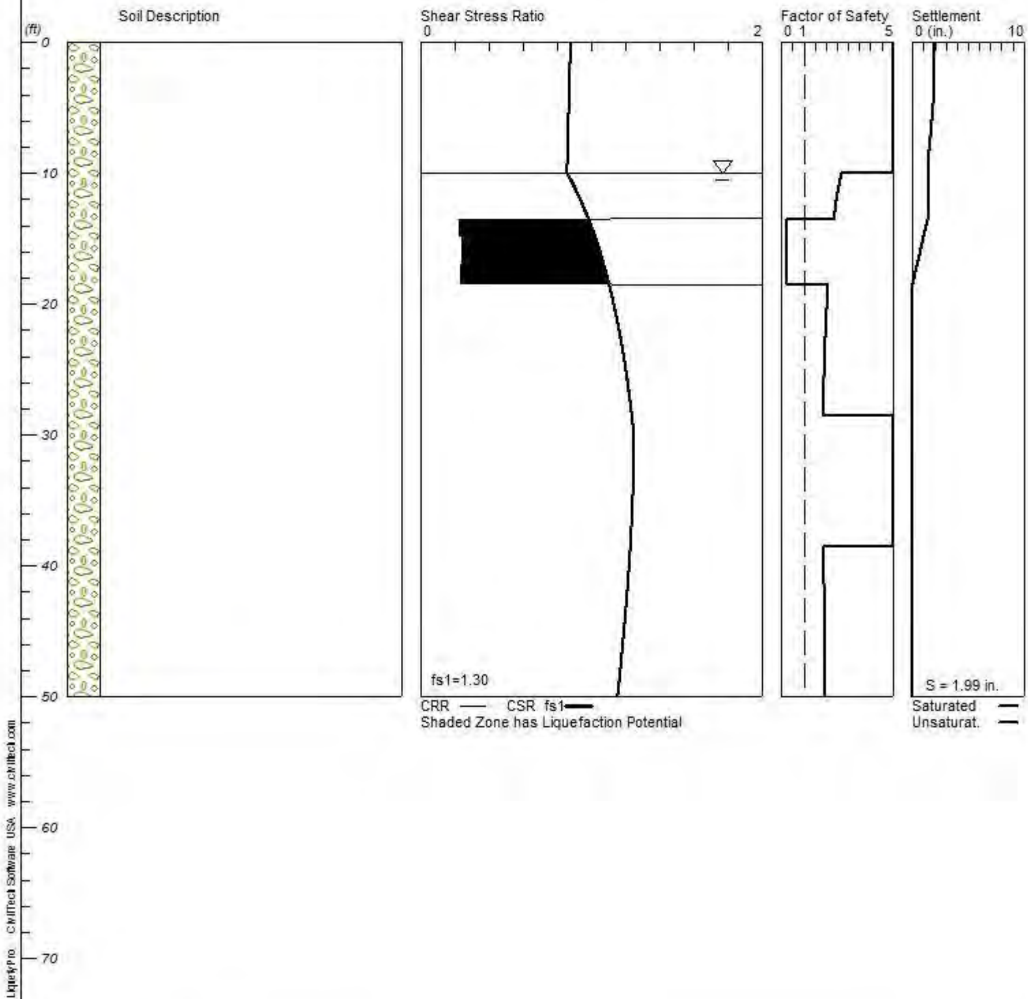
APPENDIX D

RESULTS OF LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSIS

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=B-1 Water Depth=10 ft ***Magnitude=7.08*** ***Acceleration=1.04g***



Moore Twining Associates, Inc. Relocatable Classrooms

Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS
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Input File Name: F:\ENG\Geotech\E83701.02 San Juan School Relocatable Classrooms\Liquefy\UNTITLED.liq
Title: San Juan School
Subtitle: Relocatable Classrooms

Input Data:

Surface Elev.=
Hole No.=B-1
Depth of Hole=50.00 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 14.00 ft
Max. Acceleration=1.04 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.5
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	15.00	120.00	NoLiq
3.50	11.00	120.00	47.50
8.50	43.00	120.00	12.60
13.50	9.00	120.00	12.60
18.50	15.00	120.00	37.10
23.50	29.00	120.00	37.10
28.50	11.00	120.00	NoLiq
38.50	24.00	120.00	26.40
43.50	61.00	120.00	26.40
50.00	46.00	120.00	26.40

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.04g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	120.00	0.000	120.00	0.000	1.00	0.000	1.040	0.68	1.30	0.88
1.00	120.00	0.057	120.00	0.057	1.00	0.000	1.040	0.67	1.30	0.88
2.00	120.00	0.113	120.00	0.113	1.00	0.000	1.040	0.67	1.30	0.87
3.00	120.00	0.170	120.00	0.170	0.99	0.000	1.040	0.67	1.30	0.87
4.00	120.00	0.227	120.00	0.227	0.99	0.000	1.040	0.67	1.30	0.87
5.00	120.00	0.284	120.00	0.284	0.99	0.000	1.040	0.67	1.30	0.87
6.00	120.00	0.340	120.00	0.340	0.99	0.000	1.040	0.67	1.30	0.87

7.00	120.00	0.397	120.00	0.397	0.98	0.000	1.040	0.66	1.30	0.86
8.00	120.00	0.454	120.00	0.454	0.98	0.000	1.040	0.66	1.30	0.86
9.00	120.00	0.510	120.00	0.510	0.98	0.000	1.040	0.66	1.30	0.86
10.00	120.00	0.567	57.60	0.567	0.98	0.000	1.040	0.66	1.30	0.86
11.00	120.00	0.624	57.60	0.594	0.97	0.000	1.040	0.69	1.30	0.90
12.00	120.00	0.680	57.60	0.622	0.97	0.000	1.040	0.72	1.30	0.94
13.00	120.00	0.737	57.60	0.649	0.97	0.000	1.040	0.74	1.30	0.97
14.00	120.00	0.794	57.60	0.676	0.97	0.000	1.040	0.77	1.30	1.00
15.00	120.00	0.851	57.60	0.703	0.97	0.000	1.040	0.79	1.30	1.03
16.00	120.00	0.907	57.60	0.730	0.96	0.000	1.040	0.81	1.30	1.05
17.00	120.00	0.964	57.60	0.758	0.96	0.000	1.040	0.83	1.30	1.07
18.00	120.00	1.021	57.60	0.785	0.96	0.000	1.040	0.84	1.30	1.09
19.00	120.00	1.077	57.60	0.812	0.96	0.000	1.040	0.86	1.30	1.11
20.00	120.00	1.134	57.60	0.839	0.95	0.000	1.040	0.87	1.30	1.13
21.00	120.00	1.191	57.60	0.866	0.95	0.000	1.040	0.88	1.30	1.15
22.00	120.00	1.248	57.60	0.894	0.95	0.000	1.040	0.90	1.30	1.16
23.00	120.00	1.304	57.60	0.921	0.95	0.000	1.040	0.91	1.30	1.18
24.00	120.00	1.361	57.60	0.948	0.94	0.000	1.040	0.92	1.30	1.19
25.00	120.00	1.418	57.60	0.975	0.94	0.000	1.040	0.93	1.30	1.20
26.00	120.00	1.474	57.60	1.003	0.94	0.000	1.040	0.93	1.30	1.21
27.00	120.00	1.531	57.60	1.030	0.94	0.000	1.040	0.94	1.30	1.22
28.00	120.00	1.588	57.60	1.057	0.93	0.000	1.040	0.95	1.30	1.23
29.00	120.00	1.644	57.60	1.084	0.93	0.000	1.040	0.96	1.30	1.24
30.00	120.00	1.701	57.60	1.111	0.93	0.000	1.040	0.96	1.30	1.25
31.00	120.00	1.758	57.60	1.139	0.92	0.000	1.040	0.96	1.30	1.25
32.00	120.00	1.815	57.60	1.166	0.91	0.000	1.040	0.96	1.30	1.25
33.00	120.00	1.871	57.60	1.193	0.91	0.000	1.040	0.96	1.30	1.25
34.00	120.00	1.928	57.60	1.220	0.90	0.000	1.040	0.96	1.30	1.25
35.00	120.00	1.985	57.60	1.248	0.89	0.000	1.040	0.96	1.30	1.24
36.00	120.00	2.041	57.60	1.275	0.88	0.000	1.040	0.95	1.30	1.24
37.00	120.00	2.098	57.60	1.302	0.87	0.000	1.040	0.95	1.30	1.24
38.00	120.00	2.155	57.60	1.329	0.86	0.000	1.040	0.95	1.30	1.23
39.00	120.00	2.212	57.60	1.356	0.86	0.000	1.040	0.94	1.30	1.23
40.00	120.00	2.268	57.60	1.384	0.85	0.000	1.040	0.94	1.30	1.22
41.00	120.00	2.325	57.60	1.411	0.84	0.000	1.040	0.94	1.30	1.22
42.00	120.00	2.382	57.60	1.438	0.83	0.000	1.040	0.93	1.30	1.21
43.00	120.00	2.438	57.60	1.465	0.82	0.000	1.040	0.93	1.30	1.21
44.00	120.00	2.495	57.60	1.492	0.82	0.000	1.040	0.92	1.30	1.20
45.00	120.00	2.552	57.60	1.520	0.81	0.000	1.040	0.92	1.30	1.19
46.00	120.00	2.608	57.60	1.547	0.80	0.000	1.040	0.91	1.30	1.18
47.00	120.00	2.665	57.60	1.574	0.79	0.000	1.040	0.91	1.30	1.18
48.00	120.00	2.722	57.60	1.601	0.78	0.000	1.040	0.90	1.30	1.17
49.00	120.00	2.779	57.60	1.629	0.78	0.000	1.040	0.89	1.30	1.16
50.00	120.00	2.835	57.60	1.656	0.77	0.000	1.040	0.89	1.30	1.15

CSR is based on water table at 10.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	15.00	1.80	0.75	0.000	1.70	34.43	NoLiq	11.89	46.31	2.00
1.00	15.00	1.80	0.75	0.057	1.70	34.43	NoLiq	11.89	46.31	2.00
2.00	15.00	1.80	0.75	0.113	1.70	34.43	NoLiq	11.89	46.31	2.00
3.00	15.00	1.80	0.75	0.170	1.70	34.43	NoLiq	11.89	46.31	2.00
4.00	11.00	1.80	0.75	0.227	1.70	25.25	47.50	10.05	35.29	2.00
5.00	11.00	1.80	0.75	0.284	1.70	25.25	47.50	10.05	35.29	2.00
6.00	11.00	1.80	0.75	0.340	1.70	25.25	47.50	10.05	35.29	2.00
7.00	11.00	1.80	0.75	0.397	1.59	23.57	47.50	9.71	33.28	2.00
8.00	11.00	1.80	0.75	0.454	1.48	22.05	47.50	9.41	31.46	2.00
9.00	43.00	1.80	0.85	0.510	1.40	92.09	12.60	4.95	97.05	2.00
10.00	43.00	1.80	0.85	0.567	1.33	87.37	12.60	4.79	92.16	2.00
11.00	43.00	1.80	0.85	0.624	1.27	83.30	12.60	4.65	87.95	2.00
12.00	43.00	1.80	0.85	0.680	1.21	79.75	12.60	4.53	84.28	2.00
13.00	43.00	1.80	0.85	0.737	1.16	76.63	12.60	4.42	81.04	2.00
14.00	9.00	1.80	0.85	0.794	1.12	15.45	12.60	2.29	17.75	0.19
15.00	9.00	1.80	0.95	0.821	1.10	16.98	12.60	2.35	19.33	0.21
16.00	9.00	1.80	0.95	0.848	1.09	16.71	12.60	2.34	19.05	0.21

17.00	9.00	1.80	0.95	0.876	1.07	16.45	12.60	2.33	18.77	0.20
18.00	9.00	1.80	0.95	0.903	1.05	16.20	12.60	2.32	18.52	0.20
19.00	15.00	1.80	0.95	0.930	1.04	26.60	37.10	10.32	36.92	2.00
20.00	15.00	1.80	0.95	0.957	1.02	26.22	37.10	10.24	36.46	2.00
21.00	15.00	1.80	0.95	0.984	1.01	25.85	37.10	10.17	36.02	2.00
22.00	15.00	1.80	0.95	1.012	0.99	25.50	37.10	10.10	35.60	2.00
23.00	15.00	1.80	0.95	1.039	0.98	25.17	37.10	10.03	35.20	2.00
24.00	29.00	1.80	0.95	1.066	0.97	48.03	37.10	14.61	62.63	2.00
25.00	29.00	1.80	0.95	1.093	0.96	47.43	37.10	14.49	61.91	2.00
26.00	29.00	1.80	0.95	1.121	0.94	46.85	37.10	14.37	61.22	2.00
27.00	29.00	1.80	0.95	1.148	0.93	46.29	37.10	14.26	60.55	2.00
28.00	29.00	1.80	1.00	1.175	0.92	48.16	37.10	14.63	62.79	2.00
29.00	11.00	1.80	1.00	1.202	0.91	18.06	NoLiq	8.61	26.67	0.31
30.00	11.00	1.80	1.00	1.229	0.90	17.86	NoLiq	8.57	26.43	0.31
31.00	11.00	1.80	1.00	1.257	0.89	17.66	NoLiq	8.53	26.20	0.30
32.00	11.00	1.80	1.00	1.284	0.88	17.47	NoLiq	8.49	25.97	0.30
33.00	11.00	1.80	1.00	1.311	0.87	17.29	NoLiq	8.46	25.75	0.30
34.00	11.00	1.80	1.00	1.338	0.86	17.12	NoLiq	8.42	25.54	0.29
35.00	11.00	1.80	1.00	1.365	0.86	16.94	NoLiq	8.39	25.33	0.29
36.00	11.00	1.80	1.00	1.393	0.85	16.78	NoLiq	8.36	25.13	0.28
37.00	11.00	1.80	1.00	1.420	0.84	16.62	NoLiq	8.32	24.94	0.28
38.00	11.00	1.80	1.00	1.447	0.83	16.46	NoLiq	8.29	24.75	0.28
39.00	24.00	1.80	1.00	1.474	0.82	35.58	26.40	8.90	44.47	2.00
40.00	24.00	1.80	1.00	1.502	0.82	35.25	26.40	8.86	44.11	2.00
41.00	24.00	1.80	1.00	1.529	0.81	34.94	26.40	8.82	43.75	2.00
42.00	24.00	1.80	1.00	1.556	0.80	34.63	26.40	8.78	43.41	2.00
43.00	24.00	1.80	1.00	1.583	0.79	34.33	26.40	8.74	43.07	2.00
44.00	61.00	1.80	1.00	1.610	0.79	86.52	26.40	15.30	101.82	2.00
45.00	61.00	1.80	1.00	1.638	0.78	85.80	26.40	15.21	101.01	2.00
46.00	61.00	1.80	1.00	1.665	0.78	85.10	26.40	15.12	100.21	2.00
47.00	61.00	1.80	1.00	1.692	0.77	84.41	26.40	15.03	99.44	2.00
48.00	61.00	1.80	1.00	1.719	0.76	83.74	26.40	14.95	98.69	2.00
49.00	61.00	1.80	1.00	1.747	0.76	83.08	26.40	14.86	97.95	2.00
50.00	61.00	1.80	1.00	1.774	0.75	82.44	26.40	14.78	97.23	2.00

CRR is based on water table at 14.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.00	1.00	2.00	1.16	2.00	0.88	5.00 ^
1.00	0.04	2.00	1.00	2.00	1.16	2.00	0.88	5.00 ^
2.00	0.07	2.00	1.00	2.00	1.16	2.00	0.87	5.00 ^
3.00	0.11	2.00	1.00	2.00	1.16	2.00	0.87	5.00 ^
4.00	0.15	2.00	1.00	2.00	1.16	2.32	0.87	5.00
5.00	0.18	2.00	1.00	2.00	1.16	2.32	0.87	5.00
6.00	0.22	2.00	1.00	2.00	1.16	2.32	0.87	5.00
7.00	0.26	2.00	1.00	2.00	1.16	2.32	0.86	5.00
8.00	0.29	2.00	1.00	2.00	1.16	2.32	0.86	5.00
9.00	0.33	2.00	1.00	2.00	1.16	2.32	0.86	5.00
10.00	0.37	2.00	1.00	2.00	1.16	2.32	0.86	2.70
11.00	0.41	2.00	1.00	2.00	1.16	2.32	0.90	2.58
12.00	0.44	2.00	1.00	2.00	1.16	2.32	0.94	2.48
13.00	0.48	2.00	1.00	2.00	1.16	2.32	0.97	2.39
14.00	0.52	0.19	1.00	0.19	1.16	0.22	1.00	0.22 *
15.00	0.53	0.21	1.00	0.21	1.16	0.24	1.03	0.24 *
16.00	0.55	0.21	1.00	0.21	1.16	0.24	1.05	0.23 *
17.00	0.57	0.20	1.00	0.20	1.16	0.23	1.07	0.22 *
18.00	0.59	0.20	1.00	0.20	1.16	0.23	1.09	0.21 *
19.00	0.60	2.00	1.00	2.00	1.16	2.32	1.11	2.08
20.00	0.62	2.00	1.00	2.00	1.16	2.32	1.13	2.05
21.00	0.64	2.00	1.00	2.00	1.16	2.32	1.15	2.02
22.00	0.66	2.00	1.00	2.00	1.16	2.32	1.16	1.99
23.00	0.68	2.00	1.00	2.00	1.16	2.32	1.18	1.97
24.00	0.69	2.00	1.00	2.00	1.16	2.32	1.19	1.95
25.00	0.71	2.00	1.00	2.00	1.16	2.32	1.20	1.93
26.00	0.73	2.00	1.00	2.00	1.16	2.32	1.21	1.91

27.00	0.75	2.00	1.00	2.00	1.16	2.32	1.22	1.89
28.00	0.76	2.00	1.00	2.00	1.16	2.32	1.23	1.88
29.00	0.78	0.31	1.00	0.31	1.16	2.00	1.24	5.00 ^
30.00	0.80	0.31	1.00	0.31	1.16	2.00	1.25	5.00 ^
31.00	0.82	0.30	1.00	0.30	1.16	2.00	1.25	5.00 ^
32.00	0.83	0.30	1.00	0.30	1.16	2.00	1.25	5.00 ^
33.00	0.85	0.30	1.00	0.30	1.16	2.00	1.25	5.00 ^
34.00	0.87	0.29	1.00	0.29	1.16	2.00	1.25	5.00 ^
35.00	0.89	0.29	1.00	0.29	1.16	2.00	1.24	5.00 ^
36.00	0.91	0.28	1.00	0.28	1.16	2.00	1.24	5.00 ^
37.00	0.92	0.28	1.00	0.28	1.16	2.00	1.24	5.00 ^
38.00	0.94	0.28	1.00	0.28	1.16	2.00	1.23	5.00 ^
39.00	0.96	2.00	1.00	2.00	1.16	2.32	1.23	1.89
40.00	0.98	2.00	1.00	2.00	1.16	2.32	1.22	1.90
41.00	0.99	2.00	1.00	2.00	1.16	2.32	1.22	1.90
42.00	1.01	2.00	1.00	2.01	1.16	2.33	1.21	1.92
43.00	1.03	2.00	1.00	2.00	1.16	2.32	1.21	1.93
44.00	1.05	2.00	1.00	2.00	1.16	2.31	1.20	1.93
45.00	1.06	2.00	1.00	1.99	1.16	2.31	1.19	1.94
46.00	1.08	2.00	0.99	1.99	1.16	2.30	1.18	1.94
47.00	1.10	2.00	0.99	1.98	1.16	2.30	1.18	1.95
48.00	1.12	2.00	0.99	1.98	1.16	2.29	1.17	1.96
49.00	1.14	2.00	0.99	1.97	1.16	2.28	1.16	1.96
50.00	1.15	2.00	0.98	1.96	1.16	2.28	1.15	1.97

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	46.31	NoLiq	0.00	46.31
1.00	-	-	-	46.31	NoLiq	0.00	46.31
2.00	-	-	-	46.31	NoLiq	0.00	46.31
3.00	-	-	-	46.31	NoLiq	0.00	46.31
4.00	-	-	-	35.29	47.50	0.00	35.29
5.00	-	-	-	35.29	47.50	0.00	35.29
6.00	-	-	-	35.29	47.50	0.00	35.29
7.00	-	-	-	33.28	47.50	0.00	33.28
8.00	-	-	-	31.46	47.50	0.00	31.46
9.00	-	-	-	97.05	12.60	0.00	97.05
10.00	-	-	-	92.16	12.60	0.00	92.16
11.00	-	-	-	87.95	12.60	0.00	87.95
12.00	-	-	-	84.28	12.60	0.00	84.28
13.00	-	-	-	81.04	12.60	0.00	81.04
14.00	-	-	-	17.75	12.60	0.00	17.75
15.00	-	-	-	19.33	12.60	0.00	19.33
16.00	-	-	-	19.05	12.60	0.00	19.05
17.00	-	-	-	18.77	12.60	0.00	18.77
18.00	-	-	-	18.52	12.60	0.00	18.52
19.00	-	-	-	36.92	37.10	0.00	36.92
20.00	-	-	-	36.46	37.10	0.00	36.46
21.00	-	-	-	36.02	37.10	0.00	36.02
22.00	-	-	-	35.60	37.10	0.00	35.60
23.00	-	-	-	35.20	37.10	0.00	35.20
24.00	-	-	-	62.63	37.10	0.00	62.63
25.00	-	-	-	61.91	37.10	0.00	61.91
26.00	-	-	-	61.22	37.10	0.00	61.22
27.00	-	-	-	60.55	37.10	0.00	60.55
28.00	-	-	-	62.79	37.10	0.00	62.79
29.00	-	-	-	26.67	NoLiq	0.00	26.67
30.00	-	-	-	26.43	NoLiq	0.00	26.43
31.00	-	-	-	26.20	NoLiq	0.00	26.20
32.00	-	-	-	25.97	NoLiq	0.00	25.97

33.00	-	-	-	25.75	NoLiq	0.00	25.75
34.00	-	-	-	25.54	NoLiq	0.00	25.54
35.00	-	-	-	25.33	NoLiq	0.00	25.33
36.00	-	-	-	25.13	NoLiq	0.00	25.13
37.00	-	-	-	24.94	NoLiq	0.00	24.94
38.00	-	-	-	24.75	NoLiq	0.00	24.75
39.00	-	-	-	44.47	26.40	0.00	44.47
40.00	-	-	-	44.11	26.40	0.00	44.11
41.00	-	-	-	43.75	26.40	0.00	43.75
42.00	-	-	-	43.41	26.40	0.00	43.41
43.00	-	-	-	43.07	26.40	0.00	43.07
44.00	-	-	-	100.00	26.40	0.00	100.00
45.00	-	-	-	100.00	26.40	0.00	100.00
46.00	-	-	-	100.00	26.40	0.00	100.00
47.00	-	-	-	99.44	26.40	0.00	99.44
48.00	-	-	-	98.69	26.40	0.00	98.69
49.00	-	-	-	97.95	26.40	0.00	97.95
50.00	-	-	-	97.23	26.40	0.00	97.23

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
49.95	1.15	1.00	1.15	1.97	26.40	97.26	100.00	0.000	0.0E0	0.000	0.000
49.00	1.16	1.00	1.16	1.96	26.40	97.95	100.00	0.000	0.0E0	0.000	0.000
48.00	1.17	1.00	1.17	1.96	26.40	98.69	100.00	0.000	0.0E0	0.000	0.000
47.00	1.18	1.00	1.18	1.95	26.40	99.44	100.00	0.000	0.0E0	0.000	0.000
46.00	1.18	1.00	1.18	1.94	26.40	100.00	100.00	0.000	0.0E0	0.000	0.000
45.00	1.19	1.00	1.19	1.94	26.40	100.00	100.00	0.000	0.0E0	0.000	0.000
44.00	1.20	1.00	1.20	1.93	26.40	100.00	100.00	0.000	0.0E0	0.000	0.000
43.00	1.21	1.00	1.21	1.93	26.40	43.07	100.00	0.000	0.0E0	0.000	0.000
42.00	1.21	1.00	1.21	1.92	26.40	43.41	100.00	0.000	0.0E0	0.000	0.000
41.00	1.22	1.00	1.22	1.90	26.40	43.75	100.00	0.000	0.0E0	0.000	0.000
40.00	1.22	1.00	1.22	1.90	26.40	44.11	100.00	0.000	0.0E0	0.000	0.000
39.00	1.23	1.00	1.23	1.89	26.40	44.47	100.00	0.000	0.0E0	0.000	0.000
38.00	1.23	1.00	1.23	5.00	NoLiq	24.75	79.24	0.000	0.0E0	0.000	0.000
37.00	1.24	1.00	1.24	5.00	NoLiq	24.94	79.60	0.000	0.0E0	0.000	0.000
36.00	1.24	1.00	1.24	5.00	NoLiq	25.13	79.97	0.000	0.0E0	0.000	0.000
35.00	1.24	1.00	1.24	5.00	NoLiq	25.33	80.36	0.000	0.0E0	0.000	0.000
34.00	1.25	1.00	1.25	5.00	NoLiq	25.54	80.76	0.000	0.0E0	0.000	0.000
33.00	1.25	1.00	1.25	5.00	NoLiq	25.75	81.17	0.000	0.0E0	0.000	0.000
32.00	1.25	1.00	1.25	5.00	NoLiq	25.97	81.60	0.000	0.0E0	0.000	0.000
31.00	1.25	1.00	1.25	5.00	NoLiq	26.20	82.04	0.000	0.0E0	0.000	0.000
30.00	1.25	1.00	1.25	5.00	NoLiq	26.43	82.50	0.000	0.0E0	0.000	0.000
29.00	1.24	1.00	1.24	5.00	NoLiq	26.67	82.99	0.000	0.0E0	0.000	0.000
28.00	1.23	1.00	1.23	1.88	37.10	62.79	100.00	0.000	0.0E0	0.000	0.000
27.00	1.22	1.00	1.22	1.89	37.10	60.55	100.00	0.000	0.0E0	0.000	0.000
26.00	1.21	1.00	1.21	1.91	37.10	61.22	100.00	0.000	0.0E0	0.000	0.000
25.00	1.20	1.00	1.20	1.93	37.10	61.91	100.00	0.000	0.0E0	0.000	0.000
24.00	1.19	1.00	1.19	1.95	37.10	62.63	100.00	0.000	0.0E0	0.000	0.000
23.00	1.18	1.00	1.18	1.97	37.10	35.20	100.00	0.000	0.0E0	0.000	0.000
22.00	1.16	1.00	1.16	1.99	37.10	35.60	100.00	0.000	0.0E0	0.000	0.000
21.00	1.15	1.00	1.15	2.02	37.10	36.02	100.00	0.000	0.0E0	0.000	0.000
20.00	1.13	1.00	1.13	2.05	37.10	36.46	100.00	0.000	0.0E0	0.000	0.000
19.00	1.11	1.00	1.11	2.08	37.10	36.92	100.00	0.000	0.0E0	0.000	0.000
18.00	1.09	1.00	1.09	0.21	12.60	18.52	67.86	2.326	1.4E-2	0.140	0.140
17.00	1.07	1.00	1.07	0.22	12.60	18.77	68.33	2.298	1.4E-2	0.277	0.417
16.00	1.05	1.00	1.05	0.23	12.60	19.05	68.82	2.268	1.4E-2	0.274	0.691
15.00	1.03	1.00	1.03	0.24	12.60	19.33	69.33	2.236	1.3E-2	0.270	0.961
14.00	1.00	1.00	1.00	0.22	12.60	17.75	66.46	2.411	1.4E-2	0.286	1.247
13.00	0.97	1.00	0.97	2.39	12.60	81.04	100.00	0.000	0.0E0	0.144	1.391
12.00	0.94	1.00	0.94	2.48	12.60	84.28	100.00	0.000	0.0E0	0.000	1.391
11.00	0.90	1.00	0.90	2.58	12.60	87.95	100.00	0.000	0.0E0	0.000	1.391
10.00	0.86	1.00	0.86	2.70	12.60	92.16	100.00	0.000	0.0E0	0.000	1.391

Settlement of Saturated Sands=1.391 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.
9.95	0.56	0.37	92.38	0.86	1222.48	4.0E-4	0.2686	0.0849	0.95	0.0808	9.69E-4	0.001	0.001
9.00	0.51	0.33	97.05	0.86	1181.88	3.7E-4	1.0000	0.3162	0.95	0.3007	3.61E-3	0.044	0.045
8.00	0.45	0.29	31.46	0.86	765.73	5.1E-4	1.0000	0.5281	0.95	0.5023	6.03E-3	0.092	0.137
7.00	0.40	0.26	33.28	0.86	729.87	4.7E-4	1.0000	0.4795	0.95	0.4560	5.47E-3	0.115	0.252
6.00	0.34	0.22	35.29	0.87	689.05	4.3E-4	1.0000	0.4284	0.95	0.4074	4.89E-3	0.103	0.355
5.00	0.28	0.18	35.29	0.87	629.02	3.9E-4	1.0000	0.4284	0.95	0.4074	4.89E-3	0.098	0.453
4.00	0.23	0.15	35.29	0.87	562.61	3.5E-4	1.0000	0.4284	0.95	0.4074	4.89E-3	0.098	0.551
3.00	0.17	0.11	46.31	0.87	533.37	2.8E-4	1.0000	0.3162	0.95	0.3007	0.00E0	0.044	0.595
2.00	0.11	0.07	46.31	0.87	435.50	2.3E-4	0.4416	0.1397	0.95	0.1328	0.00E0	0.000	0.595
1.00	0.06	0.04	46.31	0.88	307.96	1.6E-4	0.0336	0.0106	0.95	0.0101	0.00E0	0.000	0.595
0.00	0.00	0.00	46.31	0.88	4.09	2.1E-6	0.0010	0.0003	0.95	0.0003	0.00E0	0.000	0.595

Settlement of Unsaturated Sands=0.595 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.986 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake

CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center,
Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

APPENDIX E

FAULT RUPTURE HAZARD UPDATE REPORT PREPARED BY FUGRO LAND USA

Proposed building site, April 8, 2020

Fault Rupture Hazard Update for San Juan School

Draft Report | San Juan Bautista, California

04.00163622-PR-001 02 | April 29, 2020

Final

Moore Twining Associates, Inc.

Document Control

Document Information

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Client	Moore Twining Associates, Inc.
Client Address	2527 Fresno Street, Fresno, CA 93721 2527 Fresno Street, Fresno, California 93721
Client Contact	Ken Clark

Revision History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Approved By
01	April 27, 2020	Draft	For client review	JS	DW	MM
02	April 29, 2020	Final	For use	JS	DW	MM

Project Team

Initials	Name	Role
JS	Janet Sowers	Project Manager and Technical Lead
DW	Donald Wells	Technical Reviewer
MM	Mohamed Mekkawy	Commercial Project Manager
MS	Mindan Srisabaranjan	GIS Geologist

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Moore Twining Associates, Inc
2527 Fresno Street
Fresno, California 93721

April 29, 2020

Dear Mr. Clark,

Fugro is pleased to present this fault rupture hazard report for San Juan School in San Juan Bautista, California. The purpose of this study was to assess the proximity of active traces of the San Andreas fault to the planned site of two new relocatable classrooms at the northern end of the school campus. The report builds on and updates the fault rupture hazard study Fugro conducted for the school in 2012. The fault rupture hazard evaluation is required because San Juan School is located within a State of California Special Studies Zone (SSZ) associated with the San Andreas fault, and because the California Code of Regulations (CCR) Title 14 and the. California Administrative Code (CCR Title 24 Part 1 Section 4-317e) specify that for building sites within an SSZ, investigations must be performed to show that new school buildings will not be constructed within 50 feet of the trace of an active fault.

This report focusses on evaluation of an area at the northeast end of the campus where two new relocatable classrooms are proposed for construction. Our scope of work includes a literature/data review and field reconnaissance to specifically address the hazard of fault rupture at the proposed building site. We understand that this report will contribute to an updated geologic hazard report that Moore Twining is preparing.

We have enjoyed working with you on this interesting project. Please do not hesitate to contact us if you have questions or need further assistance.

Sincerely,

Janet M. Sowers, PhD, PG
Principal Geologist

REGISTERED GEOLOGIST
JANET M. SOWERS
No. 5614
Exp. 4/30/2022
STATE OF CALIFORNIA

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Contents

Figures in the Main Text

1. Introduction

San Juan School is located within a State of California Special Studies Zone associated with the San Andreas fault. For proposed projects within a Special Studies Zone, California Administrative Code (CAC) CCR Title 1 Part 24 Section 4-317(e) specifies that new school buildings shall not be constructed within 50 feet of the trace of an active fault. The purpose of this study is to assess the proximity of active faults to the project site.

The Aromas-San Juan School District (District) plans to place two relocatable classrooms on the pavement in the northeast portion of the campus (**Figure 2.1**). The proposed building location is approximately 165 feet from the mapped main trace of the fault. A geohazard report is required for these buildings per the requirements of the CAC and the Division of the State Architect (DSA) (IR A.4-13, rev 10-11-2016). Moore Twining Associates, Inc. (MTA) is preparing the geohazard report and has engaged Fugro to provide an evaluation of fault rupture hazard for inclusion in the 2020 geohazard report.

In 2012, Fugro worked with MTA at the San Juan School site to conduct a fault rupture hazard investigation, in preparation for seismic upgrades to several buildings and construction of a multiuse building on the campus. For that study, we conducted literature review and collaborated with MTA to log and interpret two fault trenches. Fugro prepared and submitted a report, "Surface-Fault Rupture Hazard Investigation, San Juan School Site" dated December 13, 2012, which was included in MTA's comprehensive 2012 report. This 2012 report is found as **Appendix F** of the MTA 2020 report.

In this report, which will be **Appendix E** of the MTA 2020 report, we update the 2012 fault rupture hazard study for San Juan School with focus on the proposed building site. Information from the previous investigation is incorporated as appropriate, with reference to the complete 2012 report found in **Appendix F** of the MTA 2020 report.

2. Data Review

Fugro conducted a general literature search and found no studies conducted after 2012 that update the location or characteristics of the San Andreas fault in the San Juan Bautista area, except for a study of fault slip behavior in the San Juan Bautista area published by Taira et al. (2014). This study examines seismicity records to better understand the spatial and temporal distribution of fault slip along the creeping section of the fault near San Juan Bautista and does not include any new information regarding the location of potential rupture along the fault.

As part of the data review, we contacted Jennifer Thornburg and Ron Rubin of the California Geological Survey, and Belle Philibosian of the U.S. Geological Survey and asked if they were aware of any recent research on this segment of the San Andreas fault. In 2012, Ms. Thornburg and Mr. Rubin visited and reviewed Trenches A and B at San Juan School. All three of these research geologists replied that they were not aware of any new studies of the San Andreas fault in the San Juan Bautista area.

In addition, we re-examined the previous geologic and geotechnical reports that had been prepared for the school. These reports documented investigations by Cleary Consultants, Inc. (Cleary) in 1987, which explored the open property on the north side of the creek for a proposed middle school facility; by D&M Consulting Engineers, Inc. (D&M) in 2002 who studied an area on the southeast side of the property for a proposed addition to the kindergarten building; and by Moore Twining Associates, Inc. and Fugro Consultants, Inc. (MTA-FC) (2012) who studied the main campus for a proposed seismic rehabilitation project. The MTA-FC report is included in its entirety as **Appendix F.**

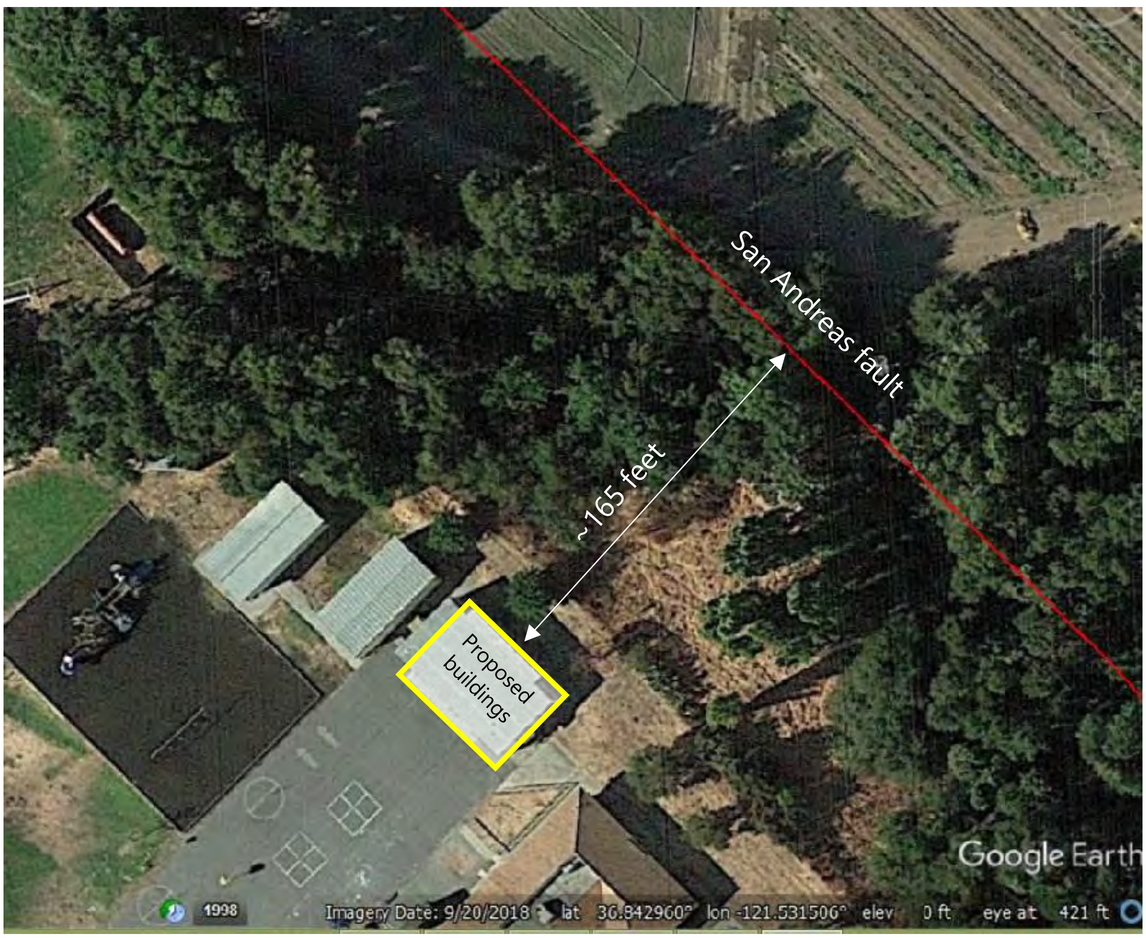


Figure 2.1: Areal Map of Proposed Buildings

Area of proposed buildings showing distance from the trace of the San Andreas fault, as mapped by the USGS and CGS, Quaternary Fault and Fold Database. Base imagery from Google Earth. The existing building shown on the imagery within the yellow rectangle has been removed.

Both the 1987 and 2002 studies included fault trenching to look for possible fault splays that might intersect the new developments as proposed at that time. The locations of Cleary trenches

(ET-1 and ET-2) and the D&M trench are shown on **Figure 3.1**. All three trenches exposed planar-bedded alluvial silts, sands, and gravels with clear bedding contacts that demonstrated the absence of shear zones or offsets indicative of faulting.

For the Cleary (1987) study, the trenches were sited on a lower and younger alluvial terrace inset into the higher and older terrace that the main school buildings occupy. These trenches, especially ET-2 located in the lowest area of the terrace, exposed alluvial sediments that were less consolidated, less cohesive, and wetter relative to the sediments exposed in the trenches on the higher terrace. Trench ET-2 encountered groundwater flows from a clean coarse sand bed at 4 to 5 feet depth, and a portion of the trench experienced caving such that the western 65 feet of the total 215-foot length of the trench had to be abandoned. Trench ET-1 was sited at a slightly higher position and only encountered groundwater at its far eastern end where the elevation was similar to ET-2. This trench clearly exposed the onlap (inset) relationship between the younger terrace alluvium and the older terrace alluvium.

The MTA-FC (2012) trenches A and B similarly exposed bedded alluvial sediments. Trench A exposed the sediments of the older terrace. Although bedding was not displaced, this trench revealed a gentle upwarping of the beds at the northeastern end, interpreted as tectonic deformation. Trench B, located at the margin of the inset terrace, exposed somewhat younger bedded alluvial sediments, which showed no faulting, offset, or warping of the alluvial bedding.

Based on existing trenching information for the site and review of existing fault mapping, no data suggest the presence of a fault or fault splay in the vicinity of the proposed new buildings. Trenches ET-2 and Trench A are located similarly close to the San Andreas fault, at distances of 200 to 300 feet on the north and south sides of the building site (**Figure 3.1**). Each exposes strata that are unbroken by faulting, indicating that no active faults extend through the immediate area of the trenches or extend parallel to the mapped trace of the San Andreas fault in the area between the two trenches. However, because of the relatively long distance between the two trenches, field reconnaissance was conducted to gather additional evidence regarding the potential presence of active faults near the proposed building site.

3. Field Reconnaissance

Field reconnaissance was conducted to examine the proposed building site and document any geomorphic evidence that may bear on the presence or absence of previously unrecognized fault splays at or within 50 feet of the proposed building locations and extending to the mapped trace of the fault. Geologists Janet Sowers and Donald Wells visited the school on April 8, 2020 and conducted three traverses. The visit was coordinated with Dan Carrillo of the District.

Traverse 1 took place on the school grounds and was guided by Gabriel, an employee of the school. We visited the area where the new buildings are to be constructed (**Figure 2.1, and**

fronticepiece). It is a vacant site where two older temporary structures had been located. According to Gabriel, these two structures were torn down in August of 2019. The first structure had been placed on an asphalt pad. The second structure had been placed on gravel northeast of the first. A third structure, the farthest northeast, remains standing. All three structures are visible in the air photo in **Figure 2.1**.

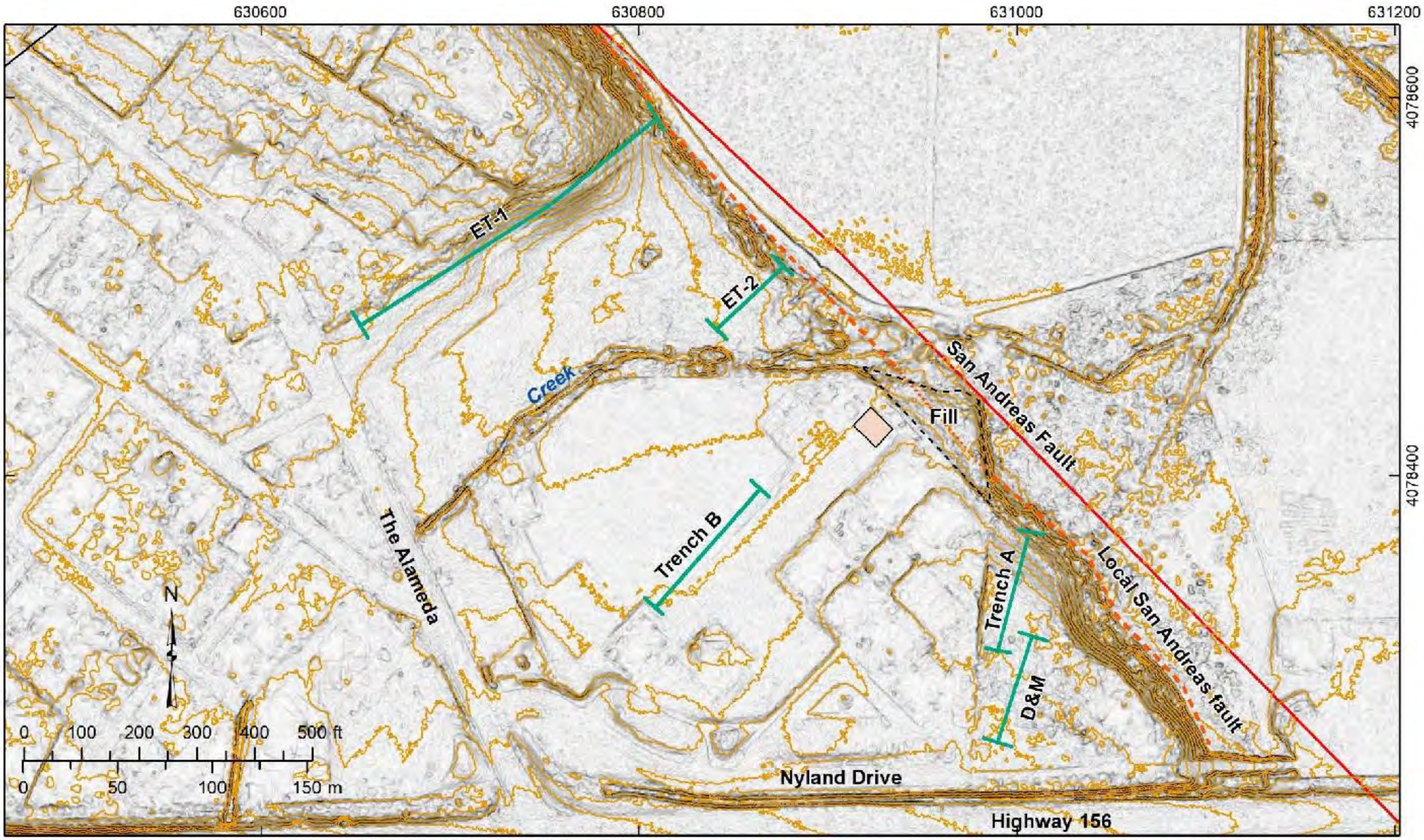
On April 3, 2012, MTA drilled two borings in the asphalt pad. The borings were clearly marked by a black asphalt plug. We speculated that the pad was on some thickness of fill, based on the presence of coarse construction sand as spoils around one of the borings.

In Traverse 2, we entered the private property adjoining the southeast side of the school, walked along the line of former Trench A to the top of the scarp, and descended the scarp. Our purpose was to examine the scarp and the mapped trace of the fault and look for evidence of the presence of a fault splay. At this location, the San Andreas fault is mapped across a marshy flat about 80 feet beyond the base of the scarp (USGS and CGS). The slope was overgrown with thick vegetation including blackberries, English ivy, and willows, thus ground features were difficult to discern. A slash line of cleared vegetation beneath the power lines afforded some views.

As exposed by the slash line, we were able to locate a north-south-trending scarp that showed clearly in the lidar topographic data. This scarp seems unlikely to be a stream cut, as the slope is relatively even and gentle, and its orientation makes it unlikely to be a fault scarp in consideration of the un-faulted sediments in Trench A, directly south of the scarp. Our interpretation is that the scarp is the margin of a body of fill, probably a road embankment for a farm road that descended northward from the terrace to the fields as shown on a historical topographic map from 1955 (U.S. Geological Survey San Juan Bautista, CA 7.5′ quadrangle, scale 1:24,000). Additional fill may be present west of the road embankment, possibly pushed out as waste from grading during school construction. The area is covered with grass and non-native poplar trees that do not occur on the rest of the slope, so were probably planted to cover the fill. The interpreted extent of this fill is shown on **Figure 3.1**.

We walked up the slope to view the proposed building site across the fence, then walked back along the fence line, completing Traverse 2.

In Traverse 3 we walked the perimeter of the mowed field on the north side of the creek extending along the northeast side of the school property to observe the locations of the Cleary Consultants (1987) trenches ET-1 and ET-2 (**Figure 3.1**). This area is underlain by younger stream terrace deposits which are inset into the higher and older stream terrace deposits which underlie the main school buildings and the town. The younger stream terrace is vertically displaced along an east-facing escarpment that parallels the mapped trace of the San Andreas fault. This scarp is in good alignment with the main northwest-trending scarp east of Trench A.



Base Map: Slope map and contours derived from lidar data, USGS lidar 2019

Legend

Trench Location — Elevation contour, 2 ft. interval — Proposed building site

Trench	Reference
ET-1	Clearly Consultants, 1987
ET-2	Clearly Consultants, 1987
D&M	D&M Consulting Engineers, 2002
Trench A	MTA-FC, 2012
Trench B	MTA-FC, 2012

Figure 3.1: Site Map Showing Fault Hazard Investigations

Examination of the lidar topographic data in ArcGIS shows that on the north side of the creek, the elevation of the inset terrace drops about 6 feet across the scarp to the agricultural fields below. The terrace surface steepens as it approaches the scarp, possibly indicating drag on the uplifted block.

4. Discussion and Conclusions

Based on our data review and field reconnaissance, two issues will be addressed relative to surface-fault rupture hazard at the site of the proposed relocatable buildings. First is the hazard of a secondary fault splay passing through the proposed site. The second is the possibility that the published trace of the San Andreas fault is imprecisely located and actually is closer relative to the building site. These issues are addressed separately below.

Based on examination of geomorphic features and on review of existing fault trenching data, the likelihood of secondary fault splay through the proposed building site is judged to be low. We identified no geomorphic evidence from field reconnaissance or from high resolution topographic data that would indicate the presence of a secondary fault splay that would extend closer to the school than the base of the scarp (shown as the dashed orange line on **Figure 3.1**). Although grading from school construction may have destroyed any potential fault scarp extending across the main scarp and higher terrace surface, the location and overlapping ground coverage of the previous trenches at and near the school site as shown on **Figure 3.1**, provide a strong framework to assess the potential for fault rupture at the proposed new building site. Specifically, these trenching studies (Cleary, 1987, Dames & Moore, Moore-Twining, 2012) consistently demonstrate a lack of fault displacement in alluvial sediments exposed in the six trenches dug on and near the school property. Trenches ET-2 and Trench A are located at a similar distance from the main trace of the fault as the proposed site, and any sub-parallel fault splay that would intersect the site should have been observed in one of these two trenches. Considering the possibility that a splay fault extends westwards at an angle of greater than about 20° to 30° from the main trace of the San Andreas fault near the site, there is no evidence to suggest such a fault is present based on the absence of active faults in the nearby trenches and the absence of any splay faults mapped at such an angle to the main trace of the San Andreas fault in the area of San Juan Bautista. **Appendix F** includes the original reports and logs for all six trenches.

The prominent linear scarp, assumed to represent the trace of the San Andreas fault northeast of the campus, does not coincide well with the trace of the San Andreas fault as mapped by the California Geological Survey and shown on the Quaternary fault and fold database (USGS/CGS). The base of the linear scarp along the northeast side of the school is 50 to 85 feet west of the mapped trace (**Figure 3.1**), significantly closer to the school. Our interpretation is that the discrepancy falls within the margin of error of the original fault mapping. The original mapping of the fault was compiled at a scale of 1:24,000, prior to public availability of high-resolution topographic data. An error of 80 feet would represent a mere 0.04 inches (1 mm) on a 1:24,000 scale map. This mapping should not be considered accurate at a local scale and for this site, may not be appropriate for measuring fault setbacks. On **Figure 3.1** we have mapped an alternate fault location, labeled "Local San Andreas fault," which tracks the base of the scarp adjacent to the school.

Assuming the base of the escarpment adjacent to the school (Local San Andreas fault on **Figure 3.1**) most closely represents the location of the primary trace of the San Andreas fault, the nearest edge of the proposed buildings is located 75 to 85 feet away from the surface trace of the fault, thus, proposed site for the buildings meets the State of California 50-foot setback requirement.

In conclusion, we judge the proposed site to have an adequate setback from the main trace of the San Andreas fault, and that there is no evidence to indicate any splay faults extend westward from the main trace closer to the building site. No further investigations are recommended.

5. References

California Geological Survey (2019). Note 48 – Checklist for the review of engineering geology and seismology reports for California public schools, hospitals, and essential services buildings, dated November 2019, 2 p.

California Geological Survey (2002). Note 49 – Guidelines for evaluating the hazard of surface fault rupture, 4 p.

Cleary Consultants, Inc. (1987). Fault location investigation, San Juan Junior High School additions, San Juan Bautista, California: unpublished technical report, 14 p.

D&M Consultants, Inc. (2002). Geologic, seismic and fault hazards assessment report, proposed kindergarten building addition, San Juan Elementary School, 100 Nyland Drive, San Juan Bautista, California: unpublished technical report, 14 p.

Moore Twining Associates, Inc. (2012). Surface-Fault Rupture Hazard, Geotechnical Engineering and Geologic/Seismic Hazard Investigation: consultant report prepared for the Aromas-San Juan School District, dated December 24.

State of California (1974). Special Studies Zones, San Juan Bautista Quadrangle, Official Map, dated July 1, 1974.

United States Geological Survey (USGS) and California Geological Survey (CGS), Quaternary fault & fold database for the United States, accessed April 13, 2020, at: https://www.usgs.gov/natural-hazards/earthquake-hazards/faults.

APPENDIX F

SURFACE FAULT RUPTURE HAZARD, GEOTECHNICAL ENGINEERING AND GEOLOGIC/SEISMIC HAZARD INVESTIGATION REPORT, PREPARED BY MOORE TWINING FOR FORMERLY PROPOSED CAMPUS IMPROVEMENTS

MOORE TWINING

Since 1898

SURFACE-FAULT RUPTURE HAZARD, GEOTECHNICAL ENGINEERING, AND GEOLOGIC/SEISMIC HAZARD INVESTIGATION PROPOSED SEISMIC REHABILITATION OF SIX EXISTING BUILDINGS AND CONSTRUCTION OF A NEW MULTI-PURPOSE BUILDING SAN JUAN SCHOOL, 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA

Project Number: E83701.01

For:

Aromas-San Juan Unified School District
2320 San Juan Highway
San Juan Bautista, CA 95045

December 24, 2012

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FX: 559.268.7126
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MOORE TWINING

Since 1898

December 24, 2012 E83701.01

Mr. Bill Rupert
Director Maintenance, Operations & Transportation
Aromas-San Juan Unified School District
2320 San Juan Highway
San Juan Bautista, CA 95045

Subject: Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation
Proposed Seismic Rehabilitation of Six Existing Buildings
And Construction of a New Multi-Purpose Building
San Juan School, 100 Nyland Drive
San Juan Bautista, California

Dear Mr. Rupert:

We are pleased to submit this Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic Seismic Hazard investigation report prepared for improvements proposed at San Juan School. The contents of this report include the purpose of the investigation, scope of services, background information, investigative procedures, our findings, evaluation, conclusions, and recommendations.

We recommend that those portions of the plans and specifications that pertain to earthwork, pavements, and foundations be reviewed by Moore Twining Associates, Inc. (Moore Twining) to determine if they are consistent with our recommendations. This service is not a part of this current contractual agreement, however, the client should provide these documents for our review prior to their issuance for construction bidding purposes.

We appreciate the opportunity to be of service to the Aromas-San Juan Unified School District. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience at (800) 268-7021.

Sincerely,

MOORE TWINING ASSOCIATES, INC.

Kenneth J. Clark, CEG
Senior Engineering Geologist

REGISTERED GEOLOGIST
KENNETH JAMES CLARK
No. EG 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

EXECUTIVE SUMMARY

This Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard investigation report was prepared for improvements proposed at San Juan School, located at 100 Nyland Drive in San Juan Bautista, California. The improvements include seismic upgrades to six (6) existing school buildings, and a new multi-purpose building. San Juan School is located near the mapped trace of the San Andreas fault.

The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California, as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act. According to the Special Studies Zone official map, San Juan Bautista Quadrangle, the existing school buildings to be seismically upgraded are located about 150 to 450 feet southwest of the trace of the active San Andreas Fault and the new multi-purpose building location is proposed approximately 450 feet southwest of the trace of the fault.

The purpose of our investigation was to provide geotechnical engineering parameters for use in design of foundations, slabs-on-grade, and preparation of related construction documents. The intent of the investigation was also to evaluate potential geologic/seismic hazards, including surface-fault rupture hazards.

The existing six buildings to be rehabilitated include five classrooms and an office constructed with precast tilt-up concrete shear walls with flexible floor and roof diaphragms. The buildings range from about 2,700 square feet to about 5,475 square feet in plan dimensions. Based on our discussions with Mr. Luis Vargus (Kasavan Architects), the building foundations are comprised of approximate four foot square and two foot deep footings at each building corner and pilaster. It is also our understanding that the buildings have no perimeter foundations between the isolated footings.

It is our understanding that plans for the seismic upgrades have not been developed, but the rehabilitation tentatively includes new 24-inch by 24-inch grade beams connecting between the existing four foot square by two foot deep spread footings, located at approximately 15 feet on center around the perimeter of each building.

It is also our understanding that the construction type proposed for the new multi-purpose building is not known. However, based on discussions with Mr. Luis Vargus (Kasavan Architects) it is anticipated that the new multi-purpose building will include structural steel or wood framing systems or CMU walls and shallow spread foundations, and a concrete slab-on-grade floor.

Appurtenant construction is anticipated to include concrete flatwork, underground utilities and landscaping. Basements and retaining walls are not anticipated for this project.

EXECUTIVE SUMMARY (continued)

The project, comprising seismic upgrades to six (6) of the existing buildings and construction of a new multi-purpose building, is subject to the California Administrative Code CCR Title 1 Part 1 which states that no new school buildings shall be constructed, rehabilitated, reconstructed or relocated within 50 feet of the trace of an active fault (fault displacement having occurred within the last 11,000 years). Accordingly, a surface-fault rupture hazard investigation was conducted to assess the presence or absence of active fault splays as related to the seismic upgrades and proposed new multi-purpose building. The fault rupture hazard investigation was conducted in October and November 2012 and included review of fault hazard reports previously prepared by others for portions of the school site, excavating two (2) exploratory trenches (477 total feet of trench), exposing pre-Holocene soils, and assessing whether faulting (ground displacement) was exhibited in the soils exposed by the trenching. The surface-fault rupture hazard investigation report is included in Appendix E of this report and states: *"No active faults were documented in the trench exposures and the sediment layers, and continuous marker horizons provide positive evidence for the absence of fault offset. These findings, in conjunction with the findings of the previous investigations (D&M Consulting Engineers, Inc. 2002, and Cleary Consultants, Inc., 1987) indicate that the surface-fault rupture hazard within the proposed improvement area of the San Juan School site is low."* The surface-fault rupture hazard investigation report also concludes that the potential for permanent ground deformation (tilting or folding) is considered low.

The potential for hazards due to landslides, flooding, volcanic activity, seiches, and tsunamis at the site is also low.

On November 21, 2012, ten (10) borings were drilled near the perimeters of the subject campus buildings, and at the location of the proposed new multi-purpose building. Borings B-1 and B-2 were drilled at the location of the proposed new multi-purpose building to depths of 21½ and 51½ feet below site grade (BSG) using a CME-75 drilling rig equipped with 6⅝-inch outside diameter (O.D.) hollow-stem augers. The remaining eight (8) borings were drilled near the perimeters of the subject existing buildings using a 4-inch diameter hand auger barrel and a 2-man power auger with 6-inch diameter auger. Auger refusal was encountered in all of the hand auger borings at depths of about 3½ to 5¼ feet BSG, due to soil layers with abundant gravels.

The near surface soils encountered at the multi-purpose building location, at and directly below the anticipated foundation depths, comprised medium stiff fat clays with "medium" expansion potential. The near surface soil conditions encountered near the perimeters of the existing school buildings were predominantly clayey or silty sand fill soils fill soils which appeared to be medium dense. Silty sand with gravel, which appeared to be medium dense to dense, was the predominant native soil type encountered near the perimeters of the existing school buildings.

Groundwater was encountered at boring B-1 at a depth of 25 feet BSG during drilling and measured in the open borehole at 14 feet BSG about 2 hours after termination of drilling. Groundwater was encountered at boring B-2 at a depth of 14½ feet BSG during drilling and measured in the open borehole at 14 feet BSG about 15 minutes later, after termination of drilling.

EXECUTIVE SUMMARY (continued)

The site is located along the western margin of the San Juan Valley, about 1,300 feet northeast of the range front. The rise of the water levels within the test borings indicates that the groundwater is under a semi-confined condition in the sand units and the clayey units are acting as aquitards. Groundwater was also encountered seeping into the bottom of Trench A, at a location about 100 feet east of the campus. A few inches of water was noted to be in the bottom of Trench A, within about 10 feet of the northeast end. It is estimated that the elevation of the ponded water in Trench A corresponds to a depth of about 15 feet below the ground surface at the proposed location of the multi-purpose building.

Groundwater level history information was not available for this site. A high groundwater table depth of 10 feet BSG was used for the liquefaction analysis and to estimate a design seismic settlement for this project.

The site is considered suitable for support of the proposed improvements relative to potential geologic hazards, provided the recommendations contained in this report are followed. From a geotechnical standpoint, the site, is suitable for the proposed seismic upgrades and new multi-purpose building construction with regard to support of the structures on shallow spread foundations and the use of concrete slabs-on-grade, provided the recommendations contained in the report are followed.

To reduce the potential for excessive differential static settlement, the new foundations for the multi-purpose building should be supported on compacted engineered fill prepared as recommended in this report.

Grade beams or continuous foundations used for the seismic rehabilitation may be supported directly on the native or fill soils.

New foundations should be designed and reinforced for the anticipated differential settlements and heave. A structural engineer experienced in foundation design should recommend the thickness, design details and concrete specifications for the foundations. Assuming the subgrade soils are prepared as recommended in this report, the new foundation design should be based on a total static settlement of 1 inch, a differential static settlement of ½ inch in 40 feet, a differential seismic settlement of ¼ inch in 40 feet, and heave of up to 1 inch total and ½ inch differential in 40 feet should also be anticipated in design.

The near surface soils encountered are considered expansive. Mitigation measures due to expansive soils, such as placement of non-expansive import soils below new slabs-on-grade, are provided in the “Recommendations” section of this report.

Chemical testing of soil samples indicated the soils exhibit a “moderately corrosive” corrosion potential. The analytical results of soil sample analyses also indicate a “negligible” potential for sulfate attack on reinforced concrete placed in the near-surface soils.

This Executive Summary should not be used for design or construction and should be reviewed in conjunction with the attached report.

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SURFACE-FAULT RUPTURE HAZARD, GEOTECHNICAL ENGINEERING, AND GEOLOGIC/SEISMIC HAZARD INVESTIGATION PROPOSED SEISMIC REHABILITATION OF SIX EXISTING BUILDINGS AND CONSTRUCTION OF A NEW MULTI-PURPOSE BUILDING SAN JUAN SCHOOL, 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA

Project No. E83701.01

1.0 INTRODUCTION

This report presents the results of a surface-fault rupture hazard investigation, geotechnical engineering investigation, and geologic/seismic hazard investigation for improvements planned at San Juan School, located at 100 Nyland Drive, San Juan Bautista, California. The improvements include seismic upgrades to six (6) existing school buildings, and a new multi-purpose building. Moore Twining Associates, Inc. (Moore Twining) was authorized by written agreement with the Aromas-San Juan Unified School District to conduct the aforementioned investigations.

The contents of this report include the purpose of the investigation and the scope of services provided. The existing site features, site history, previous studies, and existing and anticipated construction are discussed. In addition, a description of the investigative procedures used and the subsequent findings are presented. Finally, the report provides an evaluation of the findings, general conclusions, and related recommendations. The report appendices contain the drawings (Appendix A); the logs of borings (Appendix B); the results of laboratory tests (Appendix C); liquefaction and seismic settlement analyses (Appendix D), the fault hazard report prepared for this study titled "Surface-Fault Rupture Hazard Investigation" (Appendix E), two (2) fault investigation reports previously prepared by others for San Juan School (Appendix F), and photographs (Appendix G).

The Geotechnical Engineering Division of Moore Twining, headquartered in Fresno, California, performed the investigation. Moore Twining contracted with Fugro Consultants, Inc. geologists to assist with the fault rupture hazard investigation and prepare the surface-fault rupture hazard investigation report (contained in Appendix E of this report).

2.0 PURPOSE AND SCOPE OF INVESTIGATION

2.1 Purpose of Geotechnical Engineering and Geologic/Seismic Hazard Investigations: The purpose of our investigation was to provide geotechnical engineering recommendations for use in design and preparation of related construction documents. The intent of the investigation was also to evaluate potential geologic/seismic hazards, including surface-fault rupture hazards. The scope of the investigation presented in this report included conducting field exploration and a laboratory testing program, evaluating the data collected during the field exploration and laboratory testing portions of the investigation, and providing the following:

2.1.1 Geotechnical parameters for use in design of foundations and slabs on grade;

2.1.2 Recommendations for site preparation including placement, conditioning, and compaction of engineered fill soils;

2.1.3 Descriptions of potential geologic / seismic hazards in accordance with the requirements of the 2010 California Building Code and California Geological Survey Note 48;

2.1.4 Conclusions regarding the potential for liquefaction and magnitude of seismic settlement;

2.1.5 Conclusions regarding the potential for surface fault rupture and seismic induced surface deformation (tilting or folding);

2.1.6 Conclusions regarding the potential for other geologic hazards including volcanic eruption/ash flow, seismic induced landslides, etc.;

2.1.7 Recommendations for 2010 California Building Code seismic coefficients and earthquake spectral response acceleration values;

2.1.8 Recommendations for temporary excavations and utility trench backfill; and

2.1.9 Conclusions regarding soil corrosion potential.

The project, comprising seismic upgrades to six (6) of the existing buildings and construction of a new multi-purpose building, is subject to the California Administrative Code CCR Title 1 Part 1 which states that no new school buildings shall be constructed, rehabilitated, reconstructed or relocated within 50 feet of the trace of an active fault (fault displacement having occurred within the last 11,000 years). Accordingly, a surface-fault rupture hazard investigation was conducted to assess the presence or absence of active fault splays as related to the seismic upgrades and proposed new multi-purpose building. The fault rupture hazard investigation included excavating two (2) exploratory trenches (477 total feet of trench), exposing pre-Holocene soils, and assessing whether faulting (ground displacement) was exhibited in the soils exposed by the trenching. The results of the surface-fault rupture hazard investigation are summarized in the body of this report and the report, in its entirety, is contained in Appendix E of this report. Appendix F contains two (2) fault investigation reports previously prepared by others for San Juan School, which are referenced in the surface-fault rupture hazard investigation report.

This report is provided specifically for the proposed improvements described in the "Existing and Anticipated Construction" section of this report. This investigation did not include an environmental investigation, or an environmental audit.

2.2 **<u>Scope</u>:** Our proposal, dated September 6, 2012 (MTP 4112-0350), outlined the scope of our services. The actions undertaken during the investigation are summarized as follows:

2.2.1 The Site Plan, Sheet A1.1, dated August 10, 2011, prepared by Kasavan Architects, was reviewed.

2.2.2 A visual site reconnaissance was conducted.

2.2.3 Aerial photographs, topographic maps, and Light Detection and Ranging (LiDAR) remote sensing data were reviewed.

2.2.4 A report titled: "Geotechnical Investigation, Proposed Kindergarten Building Addition, San Juan Elementary School...," prepared by D & M Consulting Engineers, Inc., dated November 27, 2002, was reviewed.

2.2.5 A report titled: "Geologic, Seismic and Fault Hazards Assessment Report, Proposed Kindergarten Building Addition, San Juan Elementary School...," prepared by D & M Consulting Engineers, Inc., dated November 12, 2002, was reviewed.

2.2.6 A report titled: "Fault Location Investigation, San Juan Junior High School Additions...," prepared by Cleary Consultants, Inc., dated April 30, 1987, was reviewed.

2.2.7 The Division of the State Architect (DSA) was contacted to obtain geotechnical and geologic documents pertinent to the site, and documents were reviewed at the DSA Oakland office.

2.2.8 Select available published geologic data and reports pertinent to the project, were reviewed and are cited in this report.

2.2.9 Subsurface exploration, including trenching and test borings was conducted.

2.2.10 Laboratory tests were conducted to determine selected physical and engineering properties of the subsurface soils.

2.2.11 Mr. Bill Rupert (Director Maintenance, Operations & Transportation, Aromas-San Juan Unified School District), Mr. Luis Vargus (Kasavan Architects), Ms. Jennifer Thornburg (California Geological Survey), and Mr. Ron Rubin (California Geological Survey) were consulted during the investigation.

2.2.12 The data obtained from the investigation were evaluated to develop an understanding of the subsurface soil conditions and engineering properties of the subsurface soils.

2.2.13 This report was prepared to present the purpose and scope, background information, field exploration procedures, findings, evaluation, conclusions, and recommendations.

3.0 BACKGROUND

The site history, previous studies, existing site features, and the anticipated construction are summarized in the following subsections.

3.1 Site Description: The project site is located at the existing San Juan School campus. San Juan School is located at 100 Nyland Drive in San Juan Bautista, San Benito County, California. A site location map is presented on Drawing No. 1 in Appendix A. The site area is relatively flat with the elevation of the proposed new multi-purpose building area a few feet lower than the existing school buildings. According to the 7½ minute series topographic map (San Juan Bautista Quadrangle, 2012), produced by the United States Geological Survey (USGS), the average elevation of the site is roughly 205 feet above mean sea level and the site is located at roughly 36.842 degrees latitude and -121.532 degrees longitude.

The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California, as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act. According to the Special Studies Zone official map, San Juan Bautista Quadrangle, the existing school buildings to be seismically upgraded are located about 150 to 450 feet southwest of the trace of the active San Andreas Fault and the new multi-purpose building location is approximately 450 feet southwest of the trace of the fault.

The visible exterior portions of the subject school buildings and flatwork were observed on October 11, 2012 and November 21, 2012. The exterior of the building walls observed appeared to be painted concrete. During our site reconnaissance, signs of distress indicative of excessive differential foundation movement were not observed in the exterior walls of the buildings, nor in the Portland cement concrete flatwork adjacent to the buildings.

The locations of the existing school buildings (Buildings A, B, C, D, E, and G), where seismic upgrades are proposed, and the proposed multi-purpose building are shown on Drawing No. 2. Buildings A, B, C, D, E, and G are single-story slab-on-grade structures ranging in plan dimensions from about 2,700 square feet to about 5,475 square feet in plan dimensions.

The areas adjacent to buildings A, B, C, D, E, and G include unimproved (soil covered), landscape vegetated, and Portland cement concrete walkways. The area of the proposed multi-purpose building was covered with an asphaltic concrete play court. The new building site is bound to the north by a grass covered play ground; to the east by existing classrooms (subject buildings); to the south by a campus parking lot and Nyland Drive beyond; and the west by a gymnasium building and grass covered fields. Photographs of the existing campus are included as photograph nos. 1 through 6, in Appendix G of this report.

3.2 **<u>Site History</u>:** It is our understanding that the school campus was originally constructed about 1968. Prior to construction of the existing school campus, it is our understanding that the area of the existing school campus was primarily utilized for agricultural purposes or was vacant open land.

3.3 **<u>Previous Studies</u>:** A geotechnical investigation report, prepared by D&M Consulting Engineers, Inc., for the kindergarten building addition, dated November 27, 2002, was obtained from DSA through a records request. The report included a geologic and seismic hazard study and was prepared for design of the existing 1,400 square foot kindergarten building addition. Four (4) test borings were drilled to depths of 5 to 41½ feet BSG. The report describes the soils encountered as stiff to very stiff medium plastic lean clay underlain by medium dense to dense silty sands at depths of about 6 to 7 feet, with underlying stiff clay, silty and clayey sand deposits.

The report states:

> *Groundwater was first encountered at a depth of 28 feet below the ground surface at the time of our exploratory drilling (October 2002). With the use of rotary wash (mud rotary) drill techniques, we were unable to determine a stabilized depth to groundwater.*
>
> *The site was found to have a low potential for liquefaction related hazards due to the relatively dense alluvium and the age of the alluvium encountered beneath the design groundwater level.*
>
> *The potential for lateral spreading is low based on our finding that the liquefaction potential is low.*
>
> *The hazard due to the proposed improvements as a result of landsliding is considered to be negligible.*
>
> *There is a low hazard associated with expansive soils.*
>
> *The Kindergarten Building Addition site is outside the 100-year flood inundation zone but may experience flooding of less than one-foot in depth with a 100-year event.*

The report recommended: *"footings be on and should be placed neat against undisturbed native soils and/or engineered fill. Continuous footings should be reinforced with at least two Number 4 steel reinforcing bars at the top and bottom to provide structural continuity and permit spanning of local irregularities in soil conditions exposed at the base of the footing excavations. The footings should be embedded a minimum of 24 inches below pad grade or lowest adjacent finished grade, whichever provides a deeper embedment for perimeter strip foundations and exterior columns, and at least 18 inches below pad grade (top of pad prior to placement of the sand and gravel section discussed below in Section 4.5.2) for interior footings... Footings may be designed for a net allowable bearing pressure of 2,500 pounds per square foot due to dead plus live loads, with a one-third increase when including transient loads such as seismic or wind."*

Based on our discussions with Mr. Bill Rupert, and our review of documents at DSA Oakland office, it is our understanding that no other geotechnical engineering reports prepared for the San Juan School are available. It should be noted that the surface-fault rupture hazard investigation report (Appendix E) references two (2) previous fault investigation reports conducted by others for the San Juan school. If other reports become available, these reports should be provided for our review and consideration for this project.

3.4 Existing and Anticipated Construction: The anticipated improvements include seismic rehabilitation of six (6) existing buildings and construction of a new multi-purpose building. The existing six buildings to be rehabilitated include five classrooms and an office constructed with precast tilt-up concrete shear walls with flexible floor and roof diaphragms. Photographs of the existing campus buildings are included as photograph nos. 1 through 6, in Appendix G of this report. The buildings range from about 2,700 square feet to about 5,475 square feet in plan dimensions. Based on our discussions with Mr. Luis Vargus (Kasavan Architects), the building foundations are comprised of approximate four foot square and two foot deep footings at each building corner and pilaster. It is also our understanding that the buildings have no perimeter foundations between the isolated footings.

It is our understanding that plans for the seismic upgrades have not been developed, but the rehabilitation tentatively includes new 24-inch by 24-inch grade beams connecting between the existing 4 foot square by 2 foot deep spread footings located at approximately 15 feet on center around the perimeter of each building. A maximum seismic load of 4 kips per foot was assumed as possible vertical loading on the grade beams. In the event the actual design loads vary from those assumed, or if loads the seismic rehabilitation design relies on additional loads to the existing foundations, these loads should be provided to Moore Twining for review prior to final design.

It is also our understanding that the multi-purpose building is proposed to be approximately 8,000 square feet in plan dimensions and the construction type for the building has not been determined. However, based on discussions with Mr. Luis Vargus (Kasavan Architects) it is anticipated that the new multi-purpose building will include structural steel or wood framing systems or CMU walls and shallow spread foundations, and a concrete slab-on-grade floor. Maximum static loads for column and continuous foundations of 70 kips and 3 kips per foot, respectively, are anticipated. In the event the actual design loads for the multi-purpose building vary from those assumed, these loads should be provided to Moore Twining for review prior to final design. Photographs of the proposed location of the multi-purpose building, on the existing asphaltic concrete playcourt, are included as photograph nos. 5 and 6, in Appendix G of this report.

Appurtenant construction is anticipated to include concrete flatwork, underground utilities and landscaping. Basements and retaining walls are not anticipated for this project.

Site grading is not anticipated for the foundations and grade beams proposed for the seismic upgrades. Grading plans were not available for the multi-purpose building at the time this report was prepared. However, given the relatively flat nature of the site, it is anticipated that cuts and fills of up to about one foot may be required to achieve the proposed site grades.

4.0 INVESTIGATIVE PROCEDURES

The field exploration and laboratory testing program conducted for the geotechnical and geologic seismic hazard investigations are summarized in the following subsections.

4.1 Field Exploration: The field exploration for the geotechnical/geological hazards portion of the project consisted of a site reconnaissance, drilling test borings, soil sampling, and standard penetration tests. Details of the investigative procedures for the Surface-Fault Rupture Hazard investigation are included in Appendix E of this report.

4.1.1 Site Reconnaissance: The site reconnaissance consisted of walking the site and noting visible surface features. The reconnaissance was conducted by Mr. Ken Clark, Moore Twining engineering geologist, on October 11, 2012 and November 21, 2012. The features noted are described in the “Background” and “Visible Surface Indicators of Surface Fault Rupture” sections of this report.

4.1.2 Drilling Test Borings: The approximate locations of the test borings and the depths of the borings were selected based on the type of construction, the depth of influence of anticipated foundation loads, equipment access considerations, and subsurface soil conditions.

On November 21, 2012, ten (10) borings were drilled near the perimeters of the subject campus buildings, and at the location of the proposed new multi-purpose building. Borings B-1 and B-2 were drilled at the location of the proposed new multi-purpose building to depths of 21½ and 51½ feet BSG using a CME-75 drilling rig equipped with 6⅝-inch outside diameter (O.D.) hollow-stem augers. Eight (8) shallow borings were drilled near the perimeters of the subject existing buildings using a 4-inch diameter hand auger and a 2-man, power auger with a 6-inch diameter auger. Auger refusal was encountered in all of the hand auger borings at depths of about 3½ to 5¼ feet BSG, due to soil layers with abundant gravels. The approximate locations of the borings are depicted on Drawing No. 2 in Appendix A of this report.

The soils encountered in the test borings were logged by a geologist or engineer. The field soil classification was in accordance with the Unified Soil Classification System and consisted of particle size, color, and other distinguishing features of the soil.

The presence and elevation of free water, if any, in the borings were noted and recorded during drilling and immediately following completion of the test borings.

Test boring locations were determined by tape measurement with reference to the existing site features. The locations, as described, should be considered accurate to within about 5 feet.

4.1.3 **<u>Backfilling of Test Borings and Fault Exploration Trenches</u>:** The boreholes (approximately 4 to 7 inches in diameter) were loosely backfilled with materials excavated during the drilling operations. Due to the loose nature of the test boring backfill, some settlement of the backfill should be anticipated. The fault exploration trenches (Trench A and Trench B) were backfilled with the soils excavated. Soils were moisture conditioned, then placed into the trenches and spread to approximate 8 inch thick lifts and compacted using a backhoe-mounted sheep's foot wheel compactor. The results of compaction testing conducted by our firm indicate that the trenches were backfilled with soils compacted to at least 90 percent of the maximum relative compaction per ASTM D1557.

4.1.4 **<u>Hand Excavated Pit</u>:** A shallow pit was hand excavated adjacent to the perimeter of Building D, at the northeast corner of the building, to investigate the existing foundation depths. The approximate location of the pit is shown on Drawing No. 2, Appendix A.

4.1.5 **<u>Soil Sampling:</u>** During drilling of the hollow-stem auger borings, standard penetration tests were conducted, and both disturbed and relatively undisturbed soil samples were obtained.

The standard penetration resistance, N-value, is defined as the number of blows required to drive a standard split barrel sampler into the soil. The standard split barrel sampler has a 2-inch O.D. and a 1⅜ inch inside diameter (I.D.). The sampler is driven by a 140-pound weight free falling 30 inches. The sampler is lowered to the bottom of the bore hole and set by driving it an initial 6 inches. It is then driven an additional 12 inches, or portion thereof, and the number of blows required to advance the sampler an additional 12 inches, or portion thereof, is recorded as the N-value.

Relatively undisturbed soil samples for laboratory tests were obtained by pushing or driving a California modified split barrel ring sampler into the soil. The soil was retained in brass rings, 2.5 inches O.D. and 1-inch in height. The lower 6-inch portion of the samples were placed in close-fitting, plastic, airtight containers which, in turn, were placed in cushioned boxes for transport to the laboratory. Soil samples obtained were taken to Moore Twining's laboratory for classification and testing. In addition, bulk samples of soil were obtained for laboratory testing.

4.2 **Laboratory Testing**: The laboratory testing was programmed to determine selected physical and engineering properties of the soils sampled and tested. The tests were conducted on disturbed and relatively undisturbed samples considered representative of the subsurface materials encountered.

The results of laboratory tests on samples obtained from the test borings are summarized on the figures in Appendix C. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

5.0 FINDINGS AND RESULTS

The findings and results of the field exploration and laboratory testing are summarized in the following subsections.

5.1 **Visible Surface Indicators of Surface Fault Rupture:** Aerial photographs and LiDAR data were reviewed as part of the surface-fault rupture hazard investigation (see report Appendix E). The surface-fault rupture hazard investigation report indicates geomorphic indicators suggestive of active faulting were not noted on, or adjacent to, the school site in the areas investigated. Signs of distress indicative of excessive foundation settlement or fault displacement were not observed in the exterior walls of the buildings, nor in the Portland cement concrete exterior flatwork adjacent to the buildings.

5.2 **General Geologic Conditions:** The site is located near the western margin of the San Juan Valley. Based on our review of several geologic maps including the Preliminary Geologic Map of the San Juan Bautista Quadrangle, San Benito and Monterey Counties, California (Dibblee, Nilsen, and Brabb, 1979), the site is underlain by Quaternary alluvium. The Geologic Map of California, Santa Cruz Sheet (third printing, 1971), indicates the site area is underlain by Quaternary terrace deposits (see Drawing No. 3). According to Division of Mines Bulletin 133, Geology of the San Juan Bautista Quadrangle, California (Allen, 1946), the site area is mapped as Quaternary (Upper Pleistocene) terrace deposits, and cross sections indicate that the terrace deposits are underlain by San Juan Bautista Formation (later termed the San Lorenzo formation by Dibblee et al., 1979) described as *"as much as 1,500 feet of poorly bedded, fine-grained, fossiliferous, argillaceous and calcareous sandstones, carbonaceous grits often containing numerous wood fragments, and shales."* The cross sections also indicate that the San Juan Bautista Formation is underlain by Santa Lucia Quartz Diorite. Based on our review of published geologic information, review of the aforementioned Geologic, Seismic and Fault Hazards Assessment Report prepared by D&M Consulting, Inc. (2002), and our test boring B-1 drilled at the proposed location of the multi-use building, the alluvium at the campus extends deeper than 51½ feet below site grade. A site geologic map and soil profile cross section are is presented as Drawing Nos. 4 and 5, Appendix A.

5.3 **<u>Soil Profile</u>:** The following is a general summary of the soil conditions encountered in the borings drilled for this investigation. Detailed descriptions of the soils encountered at each location are presented on the logs of borings in Appendix B. The stratification lines shown on the logs represent the approximate boundary between soil types; the actual in-situ transition may be gradual.

Multi-Purpose Building: Asphaltic concrete, about 4 inches thick, was encountered at the surface at borings B-1 and B-2, which was underlain by about 3½ to 4 inches of aggregate base. In general, the near surface soils in the area of the proposed new multi-purpose building (borings B-1 and B-2) comprised fat clays extending from below the aggregate base section to about 4½ to 5 feet BSG. Silty and clayey sands were encountered below the near surface fat clays, extending to depths of about 8½ to 10 feet BSG. The soils below a depth of 10 feet, were lean clays and clayey sand interbedded with layers of poorly graded sand with silt to the maximum depth explored of 51½ feet BSG.

Existing School Buildings: The near surface soil conditions encountered at the existing school buildings included fill soils, which were underlain by native soils that varied from the native soils encountered at the location of the multi-purpose building. Near surface soils revealed in hand auger borings HA-1 through HA-8, drilled near the perimeters of the existing buildings, comprised clayey or silty sand fill soils. The fill soils were identified in seven (7) of the eight (8) borings, extending from the ground surface to depths of less than 1, to about 3½ feet BSG. In most of the borings the near surface soils were underlain by native silty sand with gravel encountered to the maximum depth explored of about 5¼ feet BSG. In the remainder of the borings the near surface soils were underlain by native clayey sands or sandy lean clays with gravels. Auger refusal was encountered in all of the hand auger borings at depths of about 3½ to 5¼ feet BSG due to soil layers with abundant gravels.

5.4 **<u>Soil Engineering Properties:</u>**

Multi-Purpose Building: The near surface fat clay soils in the area of the proposed new multi-purpose building (borings B-1 and B-2) were described as medium stiff, as determined by standard penetration resistance, N-values, of 6 to 7 blows per foot. Testing of one (1) fat clay soil sample revealed a moisture content of 21.5 percent. An expansion index test performed on one sample indicated a “medium” expansion index of 72. A consolidation test conducted on the near surface fat clays indicated about 9.6 percent consolidation under a load of 16 kips per square foot and a swell of about 0.7 percent at a load of 500 pounds per square foot.

The silty sands, and poorly graded sand with silt below the fat clay soils were described as medium dense, as determined by standard penetration resistance, N-values, of 14 to 16 blows per foot. These soils had a trace of fine gravel. Testing revealed that the sandy soils were non-plastic with a moisture content of about 5 percent.

Loose to medium dense clayey sands (N-values of 6 to 26 blows per foot) were encountered below the fat clays and silty sands and poorly graded sands. Test results indicate these soils have about 22 to 42 percent fines (passing the #200 screen). The results of a direct shear test indicate an angle of internal friction of 34 degrees with a cohesion of 410 pounds per square foot. These soils also had a trace of fine to coarse gravel.

Lean clays were encountered below the silty sands and poorly graded sands, at depths below 10 and 20 feet BSG. The lean clays were described as soft to very stiff, as determined by standard penetration resistance, N-values, of 2 to 16 blows per foot. These soils had a trace of fine gravel. Testing of the lean clay samples revealed moisture contents of about 16 to 19 percent.

Poorly graded sands with silt were encountered below a depth of 40 feet BSG, extending to the maximum depth explored of 51½ feet BSG. The poorly graded sands with silt were described as dense to very dense, as determined by standard penetration resistance, N-values, of 31 to 63 blows per foot. Testing revealed that the soils had a moisture content of about 14 percent.

Existing School Buildings: The clayey and silty sand fill soils encountered near the perimeters of the existing school buildings appeared to be medium dense. Testing of the clayey and silty sand samples revealed moisture contents of about 7 to 13 percent.

The native silty sand with gravel and clayey sands or sandy lean clays with gravels encountered below the fill soils appeared to be very dense or very stiff. The native soils were described as damp or moist and testing of the native soil samples revealed moisture contents of about 4 to 15 percent. An expansion index test performed on one sample of clayey sand samples indicated a "low" expansion index of 41, and an Atterberg limits test result indicated a plasticity index of 24 with a liquid limit value of 41.

Chemical testing of two (2) near surface soil samples collected from the proposed new building area and the area of the existing buildings indicated pH values of 8.4 and 8.3, with minimum resistivity values of 5,000 and 6,100 ohms-centimeter. The test results also indicated "none-detected" (<0.00060 percent by weight) concentrations of chloride in the samples and 0.0029 and 0.00073 percent by weight concentrations of sulfate for the samples collected from the new building area and the area of the existing buildings, respectively.

5.5 <u>Groundwater Conditions</u>: Groundwater was encountered in test borings drilled with the CME-75 drill rig and hollow-stem auger. At boring B-1 (multi-purpose building), groundwater was encountered at 25 feet BSG during drilling and measured in the open borehole at 14 feet BSG about 2 hours after termination of drilling. At boring B-2 (multi-purpose building), groundwater was encountered at 14½ feet BSG during drilling and measured in the open borehole at 14 feet BSG about 15 minutes later, after termination of drilling. Groundwater was also encountered seeping into the bottom of Trench A. A few inches of water ponded in the bottom of the trench, within about 10 feet of the northeast end. It is estimated that the elevation of the ponded water in Trench A corresponds to a depth of about 15 feet below the ground surface at the proposed location of the multi-purpose building.

Groundwater was encountered at a depth of 28 feet below the ground surface during the 2002 geologic/seismic and fault hazards assessment for the kindergarten building assessment (D&M Consulting Engineers, Inc.). However, because the consultant used rotary wash (mud rotary) drill techniques, they were unable to determine a stabilized depth to groundwater in the borehole.

The site is located along the western margin of the San Juan Valley, about 1,300 feet northeast of the range front. The rise of the water levels within the test borings indicates that the groundwater is under a semi-confined condition in the sand units and the clayey units are acting as aquitards. Groundwater level history information was not available for this site. Considering the depth to groundwater noted in Trench A and the water level depths measured in borings B-1 and B-2 of about 14 feet, a high groundwater table depth of 10 feet BSG was estimated for this project.

It should be recognized, that water table elevations fluctuate with time, since they are dependent upon seasonal precipitation, irrigation, land use, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered both during the construction phase and the design life of the project. The evaluation of such factors was beyond the scope of this investigation and report.

5.6 **<u>Results of Hand-Excavated Pit</u>:** A hand-excavated pit was excavated adjacent to the northeast corner of the perimeter of Building D (see Drawing No. 2 for pit location). The pit revealed a 7-inch thick concrete slab at a depth of about 8 inches below site grade, adjacent to the wall and pilaster. The slab extended out about 24 inches from the wall, or about 17 inches out from the edge of the corner pilaster. A gravelly sand or base rock material was located under the slab. Due to the buried slab, we could not excavate deep enough to encounter the foundation at the pilaster.

6.0 TECTONICS AND SEISMICITY

Numerous active and potentially active faults are located in the site region and contribute to design seismic ground motion estimates. An "active fault" is defined, for the purpose of this evaluation, as a fault that has had surface displacement within Holocene time (about the last 11,000 years). A widely accepted definition of a potentially active is a fault showing evidence of displacement older than 11,000 years and younger than 1.6 million years (Pleistocene). Faults showing evidence of displacement older than 1.6 million years are usually classified as "inactive."

Major active faults occur to the east, west, south, and north of the project site. The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act. The mapped trace of the San Andreas Fault Zone is located about 150 feet northeast of the easternmost school buildings. Numerous other active and potentially active faults also occur in the site region. The Zayante-Vergeles is located about 3 miles southwest of the site and the Calaveras fault is located about 7 miles east of the site. The location of the San Juan School site, relative to known nearby fault systems within 100 miles, is depicted on Drawing No. 6 in Appendix A of this report.

The following subsections briefly describe the major fault systems contributing to the seismic ground motion estimates for the site area. Historic seismicity and probabilistic derived seismic ground motion parameters for design are described in sections 7.2.2.1 and 7.2.2.2 of this report, respectively.

6.1 **<u>San Andreas Fault</u>:** The mapped trace of the San Andreas fault is located less than 0.1 miles (0.16 kilometers) east of the San Juan School campus. The San Andreas Fault zone defines the boundary between the North American and Pacific earth tectonic plates and accommodates most of the horizontal strike-slip motion between the plates. A portion of the school campus is located on a fault-parallel ridge and a prominent linear escarpment is located roughly 150 feet northeast of the existing campus buildings. The base of the escarpment coincides with the mapped trace of the San Andreas fault. The fault-parallel ridge may be a result of compressional tectonics occurring near the fault (see the Surface-Fault Rupture Hazard Investigation report, Appendix E).

The San Andreas fault is associated with two of the largest earthquakes that have occurred in California during historic time: the 1857 Fort Tejon earthquake (magnitude 8.3) which occurred in southeast Monterey County (near Parkfield) and the 1906 San Francisco earthquake (magnitude 8.3) which occurred near San Francisco. Due in part to the length of the fault, approximately 625 miles (1,000 kilometers), various portions (segments) of the San Andreas Fault can be characterized by distinctly different seismic behavior related to rupture location, length, and expected repeat time (Wallace, 1970; Allen, 1968; Sieh and Jahns, 1984). San Juan Bautista lies near the south end of the Santa Cruz Mountains segment and the north end of the creeping segment, which extends about 60 miles to the southeast. Within the creeping section of the San Andreas fault the fault slips aseismically and produces numerous small earthquakes (mostly M=5 and smaller), but no large ones (http://earthquake.usgs.gov/research/parkfield/geology.php).

Earthquakes occurring on various segments of the San Andreas Fault near the site, and combinations of segments rupturing during a single event, have been assigned magnitudes ranging from 6.2 to 7.9 and slip rates of 0.06 to 34 mm/yr (Cao et al., 2003).

6.2 **<u>Zayante-Vergeles Fault</u>**: The Zayante-Vergeles is a major right-lateral reverse-oblique-slip fault with late Pleistocene and possibly Holocene displacement located about 2.7 miles southwest of the site. The fault is a major northwest structural element of the Santa Cruz Mountains, likely accommodates tectonic displacement at bend in the San Andreas fault zone, and has a complex junction with the San Andreas fault about 4½ miles southeast of Hollister. The Zayante-Vergeles fault is has been assigned a magnitude of 7.0 and a slip rate of 0.1 mm/yr (Cao et al., 2003).

6.3 **Calaveras Fault**: The Calaveras Fault is considered active over a distance of more than 80 miles from Danville on the north to Hollister on the south. Tectonic creep also occurs episodically along the fault, mainly from Coyote Lake to Hollister.

Seismic activity along the Calaveras Fault (M6.2) in the vicinity of Morgan Hill has been felt in the central San Joaquin Valley as recently as April 1984.

It is estimated that the surface trace of the Calaveras Fault lies about 7 miles east of the site. Several segments located within about 11 miles of the site are assigned magnitudes of 5.73 to 6.93, with slip rates ranging from 11 to 15 mm/yr (Cao et al., 2003).

6.4 **Rinconada Fault**: The Rinconada fault and related faults constitute a major structural element known regionally as the Salinas Valley. The fault extends about 140 miles from near King City southeast to the Big Pine Fault. It is estimated that the surface trace of the Rinconada fault lies about 17 miles southwest of the site. The Rinconada fault has been assigned a magnitude of 7.5 and a slip rate of 1.0 mm/yr (Cao et al., 2003).

6.5 **Monterey Bay- Tularcitos Fault Zone**: The Monterey Bay-Tularcitos fault zone is located about 24½ miles southwest of the site. The Monterey Bay-Tularcitos fault zone is a complex zone of northwest-striking high-angle faults up to 15 km wide, which includes several active (Holocene) and potentially active (Quaternary) faults. The Monterey Bay-Tularcitos fault zone has been assigned a magnitude of 7.3 and a slip rate of 0.5 mm/yr (Cao et al., 2003).

6.6 **Ortigalita Fault**: The Ortigalita fault zone, located about 26 miles northeast of the site, is a major Holocene right-lateral strike slip fault (eastern part of the San Andreas fault system). The fault extends from about 12 miles northwest of the San Luis Reservoir southeast to the vicinity of Panoche Valley. The Ortigalita fault zone is characterized by en echelon fault traces separated by pull-apart basins. The Ortigalita fault has been assigned a magnitude of 7.1 and a slip rate of 1.0 mm/yr (Cao et al., 2003).

7.0 EVALUATION

The data and methodology used to develop conclusions and recommendations for project design and preparation of construction specifications are summarized in the following subsections. The evaluation was based upon the subsurface soil conditions determined from the field exploration and laboratory testing program and our understanding of the proposed construction. The conclusions obtained from the results of our evaluations are described in the "Conclusions" section of this report.

7.1 Geologic Hazards: The potential geologic hazards of flooding, landslides, and volcanic activity are described in the following subsections.

7.1.1 Flooding: Based on the Flood Insurance Rate Map, Community Panel number 06069C0158D, revised on April 16 2009, distributed by the Federal Emergency Management Agency, the existing school buildings A, B, C, D, E, and G and the majority of the proposed location for the multi-purpose building are located in Zone X. According to the Flood Insurance Rate Map Zone X is defined as areas outside the 0.2 percent annual chance flood plain. A portion of the northwest corner of the location for the multi-purpose building appears to be near or within "Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood. The Safety Element of the San Juan Bautista General Plan states: *"During a 100 year storm, the Salinas Grade tributary to San Juan Creek could flood Alameda Plaza, San Juan Inn, part of the School, and homes along The Alameda south of 156."*

According to the San Benito County General Plan Update, August 19, 2010: *"San Benito County could be affected by dam failure inundation from a few, relatively small dams and reservoirs, including the San Justo Reservoir located three miles southwest of Hollister and the Leroy Anderson Dam, which is located in Santa Clara County but has a dam inundation zone that covers a part of San Benito County."* The Safety Element of the San Juan Bautista General Plan does not identify any dams that would pose an inundation hazard to the school site.

7.1.2 Landslides: Due to the relatively flat relief of the school site, landslide hazard is not anticipated to be a factor for the project.

7.1.3 Volcanic Activity: California includes six volcanic regions that include volcanoes that have erupted within the last 100,000 years and are considered potential volcanic hazard sources (Miller, 1989). The subject site is not located in any of these six volcanic regions and the closest areas of Quaternary volcanism are the Mono Lake- Long Valley and Clear Lake areas located about 140 miles north and 150 miles east of the site. Considering no known areas of Quaternary volcanism are present within 100 miles of the site, the prospect for lava flows or significant ash falls at the site during the design life of the development is considered low.

7.2 Seismic Hazards: The potential for groundshaking, the potential for ground rupture, the seismic coefficients and earthquake spectral response acceleration design values, seiches, tsunamis, and the potential for liquefaction and seismic settlement are described in the following subsections.

7.2.1 Faulting and Ground Rupture: Earthquakes are caused by the sudden displacement of earth along faults with a consequent release of stored strain energy. The fault slippage can often extend to the ground surface where it manifests in abrupt relative ground displacement. Damage resulting directly from fault rupture ground displacement occurs only where structures are located astride the fault traces that move.

The locations of active and potentially active faults in the site region were established using the fault mapping portion of the computer program FRISKSP (Blake, 2002), as well as our review of the on-line 2010 Fault Activity Map of California: California Geological Survey, Geologic Data Map No. 6 (Jennings and Bryant), the U.S.G.S. Quaternary fault database, and the Special Studies Zone official map, San Juan Bautista Quadrangle. Segmentation of faults, slip rates, and maximum moment magnitudes for faults are based on "The Revised California Probabilistic Seismic Hazard Maps, June 2003, prepared by the California Geological Survey (Cao, et al., 2003). The distances from the site to the faults, fault slip rates, and maximum moment magnitude earthquake for each fault or fault segment are listed in Table No. 1.

TABLE No. 1
Active and Potentially Active Faults Located Near the Subject Site
(Within about 30 miles/50 kilometers)

FAULT NAME [Includes faults and fault segments delineated in the CGS database (Cao et al., 2003)]	Site to Fault Distance		Slip Rate (millimeters per year)	Maximum Moment Magnitude
	miles	kilometers		
SAN ANDREAS (FLOATING)	<0.10	<0.16	0.06	6.90
SAN ANDREAS (Santa Cruz Mtns+Peninsula)	<0.10	<0.16	17.0	7.42
SAN ANDREAS (Santa Cruz Mtns)	<0.10	<0.16	17.0	7.03
SAN ANDREAS (Santa Cruz Mtns+Peninsula+North Coast+Offshore)	<0.10	<0.16	20.0	7.90
SAN ANDREAS (Santa Cruz Mtns+Peninsula+North Coast)	<0.10	<0.16	20.0	7.76
ZAYANTE-VERGELES	2.7	4.4	0.1	7.00
SAN ANDREAS (Creeping)	3.7	6.0	34.0	6.20
CALAVERAS (Southern)	6.7	10.8	15.0	5.79
CALAVERAS (Southern+Central+Floating)	6.7	10.8	15.0	6.36
CALAVERAS (Southern+Central)	6.7	10.8	15.0	6.36
CALAVERAS (Southern, Central, and North)	6.7	10.8	11.0	6.93
CALAVERAS (Floating)	6.7	10.8	11.0	6.20

FAULT NAME [Includes faults and fault segments delineated in the CGS database (Cao et al., 2003)]	Site to Fault Distance		Slip Rate (millimeters per year)	Maximum Moment Magnitude
	miles	kilometers		
CALAVERAS (Central)	10.8	17.4	15.0	5.73
CALAVERAS (Central and North)	10.8	17.4	11.0	6.23
QUIEN SABE	10.9	17.5	1.0	6.40
RINCONADA	16.9	27.2	1.0	7.50
MONTEREY BAY - TULARCITOS	24.5	39.4	0.5	7.30
ORTIGALITA	26.2	42.2	1.0	7.10
MONTE VISTA-SHANNON	29.0	46.7	0.40	6.70

Note: Seismic ruptures can occur on different fault segments, and on multiple segments. These various potential rupture scenarios are included in the fault/seismicity model used for probabilistic ground motion hazard analyses. The "floating" segment is simply a specific magnitude event with a specific rupture length (based on the historical record) which is modeled as occurring on the fault at locations other than those defined by the listed segments.

The school campus is located in an Alquist-Priolo Earthquake Fault Zone for the San Andreas fault zone. The mapped trace of the San Andreas fault is located less than 0.1 miles (0.16 kilometers) east of the San Juan School campus. The Surface-Fault Rupture Hazard Investigation report (Appendix E of this report) states: *"No active faults were documented in the trench exposures and the sediment layers, and continuous marker horizons provide positive evidence for the absence of fault offset. These findings, in conjunction with the findings of the previous investigations (D&M Consulting Engineers, Inc. 2002, and Cleary Consultants, Inc., 1987) indicate that the surface-fault rupture hazard within the proposed improvement area of the San Juan School site is low."* The surface-fault rupture hazard investigation report also concludes that the potential for permanent ground deformation (tilting or folding) is considered low. Photographs of the fault investigation trenches are shown in Appendix G of this report (photograph nos. 7 through 17).

7.2.2 **<u>Groundshaking</u>**: For any given earthquake, the rock in the immediate vicinity will respond with a certain maximum acceleration and with a predominant period that depends on the nature of the rock and the source mechanism. Away from the focus of the earthquake, the shock waves begin to attenuate. The way in which the earthquake wave is altered depends to a great degree on source characteristics and to a lesser degree on the travel path.

A summary of our review of historic seismic activity relative to the site is included below.

7.2.2.1 **<u>Historic Seismic Activity</u>**: As with the seismically active California region, the general area of the site (within 100 miles) has historically experienced recurring seismic activity. Based on historical earthquake catalogs published by the California Division of Mines and Geology, and supplemental data from Townley and Allen (1939) and the U.S. Geological Survey's earthquake database system, approximately 741 historical earthquakes with magnitude 4.0 or greater have been recorded from 1900 through December 2, 2012 within a 100 mile (160 kilometer) radius of the site. A map showing the location of the project site with relation to the approximate historical earthquake epicenter locations is presented on Drawing No. 7 in Appendix A. This analysis was performed using a computer program titled EQSEARCH (1989) with updated earthquake database through the year 2005 provided by Mr. Thomas Blake with Computer Services & Software, and earthquake data from 2005 to December 2, 2012 obtained from the USGS on-line earthquake USGS database: "Circular Area Earthquake Search" (http://earthquake.usgs.gov/earthquakes/eqarchives/epic/epic_circ.php).

The nearest earthquake event (estimated magnitude = 4.1, estimated peak ground acceleration = 0.15g) found during the search occurred on November 23, 1950, approximately 1.6 miles (2.6 kilometers) southeast of the site. The largest magnitude earthquake identified in the 100 mile radius search was the 8.25 magnitude Great Earthquake of San Francisco which occurred on April 18, 1906, approximately 80 miles (128 kilometers) northwest of the site. The maximum estimated peak horizontal acceleration of 0.211g occurred at the site resulting from an earthquake occurring on June 24, 1939, about 5.4 miles (8.6 kilometers) southeast of the site.

Several large earthquakes occurred near San Juan Bautista during the 1800's. Toppozada et al. describe numerous earthquakes of likely greater than magnitude 6.0 in the San Juan Bautista region occurring during 1840 and 1841 "one of the most seismically active historical periods in the San Juan Bautista vicinity"). Toppozada suggests that the high seismicity was aftershock activity occurring near the rupture end of the 1838 earthquake (a approximate M=7.0 earthquake with 60 km rupture length extending north of the Loma Prieta rupture). A number of earthquakes of magnitude 5.0 or greater also occurred within about 12 miles of San Juan Bautista between 1883 and 1910.

7.2.2.2 **<u>Design Seismic Ground Motion Parameters and Site Class:</u>** Seismic coefficients and spectral response acceleration values were developed for building design as required by the 2010 California Building Code (CBC). The CBC methodology for determining design ground motion values is based on U.S. Geological Survey seismic hazard maps, which incorporate both probabilistic and deterministic seismic ground motion.

A table providing the recommended seismic coefficient and earthquake spectral response acceleration values for the project site is included in the foundation recommendations (section 9.5.7 of this report). The site is classified as a stiff soil (D) site with standard penetration resistance, N-values averaging between 15 and 50 blows per foot for the upper 100 feet BSG. Based on the 2010 CBC and considering a five percent damped design spectral response acceleration for short period (S_{DS}) of 1.490, the design horizontal ground acceleration for liquefaction evaluation, resulting from the maximum considered earthquake as defined by the CBC, was estimated to be 0.60g. Based on the results of a hazard deaggregation analysis, the modal magnitude earthquake event is a 8.0 magnitude event occurring on the San Andreas fault at a distance of about 0.1 miles (0.16 kilometers) from the site.

7.2.3 **<u>Seiches and Tsunamis</u>**: A seiche is a wave generated by the periodic oscillation of a body of water whose period is a function of the resonant characteristics of the containing basin as controlled by its physical dimensions. These periods generally range from a few minutes to an hour or more. The site is not near any large bodies of water, so seiches are not considered a significant hazard at the site.

Tsunamis are waves generated in oceans from seismic activity. Due to the inland location of the site, tsunamis are not considered a significant hazard for the site.

7.2.4 **<u>Liquefaction and Seismic Settlement</u>:** Liquefaction and seismic settlement are conditions that can occur under seismic shaking from earthquake events. Liquefaction describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movements of the soil mass, combined with loss of bearing usually results. Fine, well sorted, loose sand, shallow groundwater conditions, higher intensity earthquakes, and particularly long duration of ground shaking are the requisite conditions for liquefaction.

Groundwater was encountered in test borings drilled with the CME-75 drill rig at depths of 25 and 14½ feet BSG, in borings B-1 and B-2, respectively. At boring B-1, groundwater levels were measured at 15 feet BSG at termination of boring and 14 feet BSG about 2 hours after termination of boring. At boring B-2, the groundwater level was measured at 14 feet BSG at termination of the boring.

The subject site is located in an area that has **not** been mapped by the California Geological Survey for liquefaction hazards. However, liquefaction and seismic settlement analyses were conducted based on soil properties revealed by test borings B-1 and B-2, and the results of laboratory testing. Liquefaction and seismic settlement analyses were conducted using the standard penetration resistance (SPT) N-value data from the hollow-stem auger boring. The computer program LiquefyPro, developed by CivilTech Software, was used in the analysis. A horizontal ground acceleration of 0.60g was used in the analysis based on the S_{DS} value in accordance with the 2010 California Building Code. A predominant earthquake magnitude of 8.0 was also used for the evaluation based on the results of deaggregation of the probabilistic ground motion hazard assessment using the USGS online calculator (http://eqint.cr.usgs.gov/deaggint/2008/index.php). A modal source-to-site distance of 0.3 kilometers was also indicated by the USGS online calculator. Soil unit weight and fines contents determined from laboratory testing were also included in the analysis input. Considering the groundwater level data summarized in section 5.5 of this report, a high groundwater level of 10 feet BSG was used for the liquefaction and seismic settlement analyses.

The results of the analysis indicate that liquefaction would not occur in the majority of the sandy soils due to the relatively high N-values obtained for those soils. As detailed in the surface-fault rupture hazard investigation (Appendix E of this report), the soils present below the high groundwater level are Pleistocene age. The analysis indicates seismic settlements of up to about ¼ inch could occur as a result of the design level seismic event. Tabular results of the liquefaction and seismic settlement analyses (spreadsheet) are included in Appendix D.

7.2.5 **<u>Conditional Geologic Assessment</u>**: The following addresses potential hazards listed in CGS Note 48 under "Conditional Geologic Assessment" not previously addressed. Our review of a database maintained by the Department of Health Services (DHS), last updated May 4, 2010, indicates only 1 of 27 radon tests conducted reported a level of radon gas exceeding 4 picocuries per liter. The U.S. EPA recommends that individuals avoid long-term exposures to radon concentrations above 4 picocuries per liter. Based on our review of the geologic conditions at the site and the referenced data reported by the DHS, it is our opinion that the potential for radon gas levels in buildings constructed at the site to exceed 4 picocuries per liter is low.

Asbestos occurs in soil and rock naturally in certain geologic settings in California. Review of the referenced Open-File Report 2000-19, titled *A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos,* prepared by State of California Department of Conservation, Division of Mines and Geology, dated August, 2000, does not indicate the occurrence of ultramafic rock within 10 miles of the subject site. Ultramafic rocks were not observed on the site, in test borings, or in samples collected from the test borings and are not common to the geologic environment of the site. Based on the cited literature and our site observations, it is our opinion that the potential to encounter naturally occurring asbestos containing rock in the near surface soil and rock materials at the site is low.

The site region is not subject to regional subsidence, thus, subsidence is not a concern for the project.

7.3 **<u>Geotechnical Engineering</u>**: A description of the geotechnical engineering evaluations for the project are described below.

7.3.1 **<u>Subsurface Conditions</u>:** The primary geotechnical engineering concerns for design and construction of the proposed project are: 1) the expansive nature of the near surface soils; 2) the potential for wet, unstable soils to be encountered during earthwork, and 3) the special attention that should be given to temporary excavations and foundation monitoring where new foundations or grade beams are excavated at the existing school buildings.

7.3.2 <u>Expansive Soils</u>: One of the potential geotechnical hazards evaluated is the expansion potential of the near surface soils. Over time, expansive soils will experience cyclic drying and wetting as the dry and wet seasons pass. Expansive soils experience volumetric changes (shrink/swell) as the moisture content of the clayey soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade when not designed for the anticipated expansive soil pressures. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction. The potential for damage to slabs-on-grade and foundations supported on expansive soils can be reduced by placing non-expansive fill below slabs-on-grade and extending perimeter foundations or thickened slab edges continuously to a sufficient depth where moisture changes are limited.

In evaluation of the expansive soils potential at the site, expansion index testing was performed on representative samples of the near surface soils which are anticipated to be within the zone of influence of the planned improvements. The expansion tests were performed in accordance with ASTM D4829 and the result is summarized in Appendix C of this report. The result of expansion index tests indicated that the near surface fat and lean clay soils have medium to low expansion potential, with expansion index values of 72 and 41, respectively. Consistent with these results, the near surface soils encountered in the area of the proposed multi-use building had a higher expansion potential than the near surface soils encountered in the area of the existing school buildings.

Based on the expansion potential of the near surface soils, this report recommends support of new slabs-on-grade on an imported, non-expansive fill to reduce the potential for excessive heave of slabs on grade. Chemical treatment (i.e., lime treatment) of the on-site soils could also be evaluated for use as a potential non-expansive fill below the slabs-on-grade. However, laboratory suitability testing, including compressive strength determinations, etc. would be required. In addition to placement of a non-expansive fill below slabs on grade, continuous thickened edges or perimeter foundations should be included in the building design to form a moisture cutoff as recommended in this report.

7.3.3 <u>Wet Weather Conditions and Unstable Soils</u>: Due to the fine grained nature of the soils, stabilization of the bottom of excavations may be necessary if the earthwork is conducted in wet weather conditions. Thus, special stabilization measures (i.e., placement of geotextile fabric and rock, chemical treatment, etc.) should be anticipated during earthwork for these conditions. It should be noted that stabilization by placement of geotextile fabric and rock will require additional excavation be conducted below the over-excavation depths recommended in this report. A specification for chemical treatment of soil is included in Appendix E of this report, if this method of stabilization is considered.

7.3.4 <u>Temporary Excavations and Foundation Monitoring</u>: Special attention should be given to temporary excavations and foundation monitoring where new foundations or grade beams are excavated at the existing school buildings to be seismically upgraded. Depending on the depth of existing foundations and/or improvements to be removed, and the depth of new foundations, temporary excavations adjacent to the existing adjacent foundation systems or utilities may require shoring. Excavations for the new construction should not be conducted below a 1.5(H) to1(V) line extending from the top of the existing foundations, slabs-on-grade, etc. unless those portions of the structure adjacent to the excavation are underpinned, shored or if the excavations are conducted in limited widths (i.e., slots) adjacent to existing foundations. Excavations too close to existing slabs and foundations could undermine foundation support and damage the existing buildings. Existing improvements, foundations, etc. within influence of the construction, such as temporary excavations, should be monitored by level surveys.

It is recommended the existing buildings and improvements be inspected prior to and after construction of the seismic upgrades, and any cracks and related distress should be repaired prior to completion of the project.

7.3.5 <u>Static Settlements and Bearing Capacity of Shallow Foundations:</u> The potential for excessive total and differential static settlement of foundations and slabs-on-grade was evaluated for the proposed structure based on the assumed loads given in the “Anticipated Construction” of this report. The increases in effective stress to underlying soils which can occur from new foundations and structures, placement of fill, withdrawal of groundwater, etc. can cause vertical deformation of the soils, which can result in damage to the overlying structures and improvements. The differential component of the settlement is often the most damaging. In addition, the allowable bearing pressures of the soils supporting the foundations should be evaluated for shear and punching type failure of the soils resulting from the imposed foundation loads.

Based on our evaluations, the near surface soils will not provide adequate direct support for foundations and slabs-on-grade for the proposed multi-purpose building due to the potential for excessive differential settlement. Based on the results of our evaluations, recommendations for compaction / preparation of the building pad subgrade (multi-purpose building) is included in the “Recommendations” section of this report to limit static settlements to 1 inch total and ½ inch differential in 40 feet by support of foundations on engineered fill. The static settlements for the multi-purpose building are based upon a net allowable soil bearing pressure of 2,500 pounds per square foot, for dead-plus-live loads, with a one-third increase for transient loads such as wind or seismic.

The net allowable soil bearing pressure is the additional contact pressure at the base of the foundations caused by the structure. The weight of the soil backfill and weight of the footing may be neglected. The net allowable soil bearing pressure presented was selected to satisfy both the static settlement criteria and Terzaghi bearing capacity equations for spread foundations. A factor of safety of 3.0 was used to determine the allowable bearing capacity based on Terzaghi equations. Schmertmann's method was used to estimate foundation settlements. If the actual maximum loads are other than those indicated in the "Existing and Anticipated Construction" section of this report, these loads should be provided to Moore Twining to evaluate the anticipated settlements.

7.3.6 **Corrosion Protection:** The risk of corrosion of construction materials relates to the potential for soil-induced chemical reaction. Corrosion is a naturally occurring process whereby the surface of a metallic structure is oxidized or reduced to a corrosion product such as iron oxide (i.e., rust). The metallic surface is attacked through the migration of ions and loses its original strength by the thinning of the member. Corrosion can eventually damage or destroy a metallic object.

Soils make up a complex environment for potential metallic corrosion. The corrosion potential of a soil depends on soil resistivity, texture, acidity, field moisture and chemical concentrations. In order to evaluate the potential for corrosion of metallic objects in contact with the onsite soils, chemical testing of soil samples was performed by Moore Twining as part of this report. The test results are included in Appendix C of this report. Conclusions regarding the corrosion potential of the soil tested are included in the "Conclusions" section of this report. If piping or concrete are placed in contact with imported soils, these soils should be analyzed to evaluate the corrosion potential of these soils.

If the manufacturers or suppliers cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e., a corrosion engineer, with experience in corrosion protection should be consulted to provide design parameters. Moore Twining does not provide corrosion engineering services.

7.3.7 **Sulfate Attack of Concrete:** Degradation of concrete in contact with soils due to sulfate attack involves complex physical and chemical processes. When sulfate attack occurs, these processes can reduce the durability of concrete by altering the chemical and microstructural nature of the cement paste. Sulfate attack is dependent on a variety of conditions including concrete quality, exposure to sulfates in soil/groundwater and environmental factors. The standard practice for geotechnical engineers in evaluation of the soils anticipated to be in contact with concrete is to perform testing to determine the sulfates present in the soils. The test results are then compared with the provisions of ACI 318, section 4.3 to provide guidelines for concrete exposed to sulfate-containing solutions. Common methods used to resist the potential for degradation of concrete due to sulfate attack from soils include, but are not limited to the use of sulfate-resisting cements, air-entrainment and reduced water to cement ratios.

The soil corrosion data included in this report should be provided to the manufacturers or suppliers of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturers or suppliers cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e., a corrosion engineer, with experience in corrosion protection should be consulted to provide design parameters.

8.0 CONCLUSIONS

Based on the data collected during the field exploration and laboratory testing program, our geotechnical experience in the vicinity of the project site, and our understanding of the anticipated construction, the following general conclusions are presented.

8.1 The site is considered suitable for support of the proposed improvements relative to geotechnical and geologic hazards, provided the recommendations contained in this report are followed. It should be noted that the recommended design consultation and construction monitoring by Moore Twining are integral to this conclusion.

8.2 The near surface soils encountered at the multi-purpose building location comprised medium stiff fat clays with "medium" expansion potential. The near surface soil conditions encountered near the perimeters of the existing school buildings were predominantly clayey or silty sand fill soils which appeared to be medium dense.

8.3 Groundwater was encountered at boring B-1 (multi-purpose building), at 25 feet BSG during drilling and measured in the open borehole at 14 feet BSG about 2 hours after termination of drilling. At boring B-2 (multi-purpose building), groundwater was encountered at 14½ feet BSG during drilling and measured in the open borehole at 14 feet BSG about 15 minutes later, after termination of drilling. A few inches of water ponded in the bottom of the Trench A, at the northeast end. It is estimated that the elevation of the ponded water in Trench A corresponds to a depth of about 15 feet below the ground surface at the proposed location of the multi-purpose building.

8.4 The surface-fault rupture hazard investigation report (see report Appendix E) indicates geomorphic indicators suggestive of active faulting were not noted on or adjacent to the school site in the areas investigated. The surface-fault rupture hazard investigation report indicates the potential for fault rupture on the site is considered low.

8.5 The near surface native fat clays encountered at the location of the proposed multi-purpose building exhibited high compressibility characteristics. Settlement analyses for these soils indicate that new foundations should be supported on engineered fill to reduce the potential for excessive static settlement. New foundations supported on engineered fill placed and compacted as recommended in this report should be designed for static total and differential settlements of 1 inch and ½ inch in 40 feet, respectively. A net allowable static soil bearing pressure of 2,500 pounds per square foot (for dead-plus-live loads) may be used for design, with a one-third increase for transient loads such as wind or seismic.

8.6 The near surface fill and native clayey sand and silty sand soils encountered at the locations of the seismic rehabilitation appeared medium dense to very dense. Grade beams or continuous foundations used for the seismic rehabilitation may be supported directly on the native or fill soils. New foundations for the seismic rehabilitation (if any) should be designed for static total and differential settlements of 1 inch and ½ inch in 40 feet, respectively. A net allowable soil bearing pressure of 2,500 pounds per square foot (for dead-plus-live loads), may be used for design, with a one-third increase for transient loads such as wind or seismic.

8.7 The near surface soils encountered are considered expansive. Mitigation measures due to expansive soils are provided in the "Recommendations" section of this report.

9.7 The potential for hazards due to landslides, flooding, volcanic activity, seiches, and tsunamis at the site is low.

8.8 Chemical testing of soil samples indicated the soils exhibit a "moderately corrosive" corrosion potential.

8.9 The analytical results of a soil sample analysis indicate a "negligible" potential for sulfate attack on concrete placed in the near-surface soils (ACI 318).

9.0 RECOMMENDATIONS

Based on the evaluation of the field and laboratory data and our geotechnical experience in the vicinity of the project, we present the following recommendations for use in the project design and construction. However, this report should be considered in its entirety. When applying the recommendations for design, the background information, procedures used, findings, evaluation, and conclusions should be considered. The Contractor should be required to comply with the recommendations included in this report. The recommended design consultation and observation of clearing, demolition activities and earthwork operations by Moore Twining are integral to the proper application of the recommendations.

9.1 General

9.1.1 Moore Twining should be provided the opportunity to review preliminary and final grading and foundation plans before the plans are released for bidding purposes so that any relevant recommendations can be presented. If proposed foundation loading or the planned construction is different from that described in the "Existing and Anticipated Construction" section of this report, the recommendations in this report may not be appropriate. Moore Twining should be notified and requested to provide supplemental recommendations for the proposed construction if changes are planned.

9.1.2 A preconstruction meeting including, as a minimum, the owner, architect, general Contractor, contractor's surveyor, earthwork, foundation subcontractors, and Moore Twining should be scheduled by the general Contractor at least one week prior to the start of clearing and grubbing. The purpose of the meeting should be to discuss critical project issues, concerns and scheduling.

9.1.3 If any city, county, and/or state standards are cited on the plans or specifications, these standards should be in addition to the recommendations in this report.

9.1.4 The Contractor should be requested to include in the base bid the costs to perform the work required by this report, and the project plans and specifications, whichever is most stringent. After review of the aforementioned documents, the contractor(s) bidding on this project should determine if the data are sufficient for accurate bid purposes. If the data are not sufficient, the Contractor should conduct, or retain a qualified geotechnical engineer to conduct, supplemental studies and collect more data as required to prepare accurate bids.

9.1.5 All wells encountered which are to be removed should be abandoned per state and local requirements. The contractor should obtain an abandonment permit from the local environmental health department, and issue certificates of destruction to the owner upon completion.

9.1.6 Existing adjacent facilities should be protected from damage including but not limited to existing slabs-on-grade, pavements, utilities, buildings, etc.

9.1.7 A demolition plan should be prepared to identify existing improvements such as flatwork, underground utilities, etc. that are to be demolished and removed as part of the project.

9.1.8 Appropriate equipment such as low-pressure equipment, steel tracks, etc. should be used to achieve the required over-excavation, compaction and subgrade stabilization to minimize rutting and subgrade instability.

9.1.9 It may be possible to consider chemical treatment (i.e., lime treatment) of the on-site soils as an alternative to the use of imported non-expansive fill below slabs on grade to reduce the thickness of the imported, granular non-expansive materials recommended below slabs-on-grade in this report. However, lime suitability testing would need to be conducted in order to determine if the on-site clay soils are suitable for lime treatment for this use.

If lime suitability testing is desired, Moore Twining can develop an estimate for conducting lime suitability/mix design testing (i.e., plasticity index, lime optimization testing, compressive strength testing per CTM 373, etc.). The lime suitability/mix design testing typically takes approximately 3 weeks for sample preparation and testing.

9.2 Site Grading and Drainage

9.2.1 It is critical to develop and maintain site grades which will drain surface and roof runoff away from foundations and floor slabs - both during and after construction. Adjacent exterior finished grades should be sloped a minimum of two (2) percent for a distance of at least ten (10) feet away from the structure, or as necessary to preclude ponding of water adjacent to foundations, whichever is more stringent. Adjacent exterior grades which are paved should be sloped at least 1 percent away from the foundations.

9.2.2 Surface grades should be designed so that surface water drains positively away from the building foundations. Surface water must not be allowed to pond adjacent to the building foundations. To reduce the potential for negative drainage, it is recommended to provide rain gutters and direct all water from roof drains into closed conduits that are connected to an acceptable discharge area away from the building foundation, upon an impervious surface that will direct water away into a storm drain, or directly into the site storm drain system.

9.2.3 It is recommended that landscaped, planted areas, etc. not be placed directly adjacent to the building foundations. Trees should be setback from proposed structures at least 10 feet or a distance equal to the anticipated drip line radius of the mature tree. For example, if a tree has an anticipated drip-line diameter of 30 feet, the tree should be planted at least 15 feet away (radius) from proposed or existing buildings.

9.2.4 Landscape and planter areas should be irrigated using low flow irrigation (such as drip, bubblers or mist type emitters). The use of plants with minimal water requirements are recommended.

9.3 Site Preparation

9.3.1 All topsoil, vegetation, organics, and debris should be removed from all areas of planned improvements. The general depth of stripping should be sufficiently deep to remove all root systems and soils with organic contents of more than 3 percent by dry weight. The surface organic cover should not be disced into the soils. For estimating purposes, a minimum stripping depth of 6 inches should be used for landscape grass areas. The actual depth of stripping should be reviewed by Moore Twining at the time of construction. It is possible that deeper stripping may be required if any roots larger than ¼-inch are encountered during grading and in localized areas, such as low areas where water may pond, or at locations of previously existing trees. Stripping should extend laterally a minimum of 5 feet outside the limits of the new improvements (i.e., proposed buildings, slabs-on-grade, pavements, etc.), or to the edges of flatwork to remain. The organic-rich materials will not be suitable for use as engineered fill; however, stripped topsoil may be stockpiled and reused in landscape areas at the discretion of the owner and upon approval by the project architect and landscape architect.

9.3.2 Existing surface and subsurface improvements located within the limits of the proposed construction should be removed and backfilled with engineered fill. This includes the asphaltic concrete and underlying base rock at the multi-purpose building location. Over-excavation should extend a minimum of 12 inches below the bottom of the existing improvements to be removed, or to the depth required to remove all disturbed soils, whichever is greater. Utilities should be completely removed and disposed of off-site and should not be crushed and buried in-place. In addition, all trench backfill soils and materials should be removed and the excavations backfilled with engineered fill. Improvements such as utilities or subsurface structures encountered during grading which are not scheduled to remain should be removed in their entirety and all loose backfill should be over-excavated and backfilled as engineered fill. Prior to backfill, the bottom of the excavation should be scarified to a depth of 8 inches, moisture conditioned to slightly above optimum moisture content and compacted as engineered fill.

9.3.3 Following stripping and removal of surface and subsurface improvements, the area of the **multi-purpose building** should be over-excavated to a minimum depth of 12 inches below the bottom of existing improvements to be removed, to a minimum of 2 feet below preconstruction site grades, 2 feet below the bottom of the floor slab, to a depth of 1 foot below proposed foundations, or to the depth required to remove undocumented fills (if any encountered), whichever is greater.

The zone of the over-excavation should include the entire building pad preparation limits defined as the building footprint and extending laterally a minimum of five (5) feet beyond the building foundations, and 3 feet beyond adjacent proposed walkways, whichever is greater. Slot cutting only below foundations will not be allowed. Upon approval of the over-excavation limits by Moore Twining based on the survey data provided by the Contractor, the soils at the bottom of the excavation should be scarified to a minimum depth of 8 inches, moisture conditioned to within 1 to 4 percent over optimum moisture content and compacted as engineered fill. The resulting excavation should be backfilled to finished grades with engineered fill. The limits of over-excavation for the buildings should be shown on the project plans.

9.3.4 Following stripping and removal of surface and subsurface improvements, areas under, and within 2 feet laterally of new or replacement concrete door stoops or walkways located along the perimeters of the existing buildings where seismic rehabilitation occurs should be over-excavated to a minimum depth of 12 inches below the bottom of the new slab, 12 inches below existing improvements to be removed, whichever is greater. Imported non-expansive fill soils are recommended below new or replacement concrete door stoops or walkways located along the perimeters of the existing buildings.

9.3.5 Following stripping and removal of surface and subsurface improvements, areas to receive exterior slabs outside the building pad preparation limits, should be over-excavated to a depth of 12 inches below the existing improvements to be removed, to the bottom of the imported, non-expansive fill section, to 12 inches below preconstruction site grades, or to the depth required to remove existing undocumented fills (if any), whichever is greater. The zone of over-excavation should extend laterally a minimum of 3 feet outside the exterior slabs. The bottom of the excavation should be scarified to a minimum depth of 8 inches, moisture-conditioned to slightly over optimum moisture content, and compacted as engineered fill. The resulting excavation should be backfilled to finished grades with engineered fill.

9.3.6 Following stripping and removal of surface and subsurface improvements, areas of new asphaltic concrete play courts should be over-excavated to a depth of 12 inches below the existing improvements to be removed, to the bottom of the aggregate base section, to a depth of 12 inches below preconstruction site grades, or to the depth required to remove existing improvements or undocumented fills, whichever is greater. The zone of over-excavation should extend laterally a minimum of 3 feet outside the perimeters of new pavements. The bottom of the excavation should be scarified to a minimum depth of 12 inches, moisture-conditioned to with 1 to 4 percent over optimum moisture content, and compacted as engineered fill. The resulting excavation should be backfilled to finished grades with engineered fill.

9.3.7 It is recommended that extra care be taken by the Contractor to ensure that the horizontal and vertical extent of the over-excavation and compaction conform to the site preparation recommendations presented in this report.

Moore Twining is not responsible for surveying the horizontal or vertical extent of over-excavation and compaction. The Contractor should verify in writing to the owner that the horizontal and vertical over-excavation limits were completed in conformance with the recommendations of this report, the project plans, and the specifications (the most stringent applies) based on surveyed data. It is recommended this verification should be performed by a licensed surveyor including a plan showing the horizontal limits of the over-excavation and cross-sectional profiles showing the vertical extent of the over-excavation for each building pad. The licensed surveyor should indicate in writing that the over-excavation elevation and extent complied with this report. The verification should be provided prior to excavating for the foundations.

9.3.8 All fill required to bring the site to final grades should be placed as engineered fill. In addition, all native soils over-excavated should be compacted as engineered fill.

9.3.9 The moisture content and density of the compacted soils should be maintained until the placement of the imported non-expansive fill, aggregate base, vapor retarder and concrete slabs. If soft or unstable soils are encountered during excavation or compaction operations, our firm should be notified so the soils conditions can be examined and additional recommendations provided to address the pliant areas.

9.3.10 The Contractor is responsible for the disposal of concrete, asphaltic concrete, soil, spoils, etc. that must be exported from the site. Individuals, facilities, agencies, etc. may require analytical testing and other assessments of these materials to determine if these materials are acceptable for the intended use by the receiving party. The Contractor is responsible to perform the tests, assessments, etc. to determine the appropriate method of disposal. In addition, the Contractor is responsible for all costs to dispose of these materials in a legal manner.

9.4 Engineered Fill

9.4.1 The on-site near surface soils encountered in the area of the proposed multi-purpose building were fat clay soils. These soils are not considered suitable for use as engineered fill within the upper 24 inches below new concrete slabs-on-grade within the new building pad limits (i.e. interior building slabs and all concrete adjacent to the buildings). These soils are also not considered suitable within the upper 12 inches below new concrete slabs-on-grade outside the building pad limits. Engineered fill within the upper 24 inches below new concrete slabs-on-grade within the building pad limits and

12 inches below exterior slabs on grade should consist of imported, granular fill in accordance with sections 9.4.3 and 9.4.4 of this report. In addition, new asphaltic concrete playcourts should be underlain by at least 4 inches of aggregate base.

The on-site near surface soils encountered in the area of the existing building were predominantly a mixture of silty sands and lean clay soils. In the area along the perimeters of the **existing buildings** where seismic rehabilitation occurs, the native soils are not considered suitable for use as engineered fill within the upper 12 inches below new or replacement concrete door stoops or walkways, nor within 2 feet laterally of edges of these improvements. Imported non-expansive fill soils (see sections 9.4.3 and 9.4.4 of this report) are recommended below new or replacement concrete door stoops or walkways along the perimeters of the existing buildings.

Near surface native soils that are free of debris, roots greater than ¼ inch in diameter, particles greater than 3 inches in diameter, and debris, are considered suitable for use as engineered fill material below the imported, granular fill (and aggregate base underlying new playcourts), provided they are aerated or moisture conditioned in accordance with the recommendations of this report. If soils other than those considered in this report are encountered, Moore Twining should be notified to provide alternate recommendations.

9.4.2 The compactability of the native soils is dependent upon the moisture contents, subgrade conditions, degree of mixing, type of equipment, as well as other factors. The evaluation of such factors was beyond the scope of this report; therefore, they should be evaluated by the Contractor during preparation of bids and construction of the project.

9.4.3 Imported fill soil should be non-contaminated, non-corrosive, non-expansive and granular in nature and contain enough fine-grained material (binder) to allow cutting "neat" footing trenches with all of the following acceptance criteria recommended

Percent Passing 3-Inch Sieve	100
Percent Passing No. 4 Sieve	85 - 100
Percent Passing No. 200 Sieve	10 - 30
Expansion Index (ASTM D4829)	Less than 10
Organics	< 3% by weight
Sulfates	< 0.05 % by weight
Min. Resistivity	> 5,000 ohms-cm

9.4.4 Prior to importing fill, the Contractor shall submit test data that demonstrates that the proposed import complies with the recommended criteria for both geotechnical and environmental compliance. Also, prior to being transported to the site, the import material shall be certified by the Contractor and the supplier (to the satisfaction of the Owner and DSA) that the soils do not contain any environmental contaminates regulated by local, state or federal agencies having jurisdiction. This certification shall consist of, as a minimum, analytical data specific to the source of the import material in accordance with the Department of Toxic Substances Control, “Informational Advisory, Clean Imported Fill Material,” dated October 2001. The list of constituents to be tested for the fill source shall be submitted to the Owner for review and approval prior to the Contractor testing the fill.

9.4.5 Onsite clay soils should be placed in loose lifts approximately 8 inches thick or less, moisture-conditioned or air dried to within one (1) to four (4) percent above optimum moisture content, and compacted to a dry density of at least 90 percent of the maximum dry density but not more than 95 percent of the maximum dry density as determined by ASTM Test Method D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.4.6 Imported granular engineered fill soils should be placed in loose lifts approximately 8 inches thick or less, moisture-conditioned or air dried to between optimum and 3 percent above the optimum moisture content, and compacted to at least 92 percent of the maximum dry density as determined by ASTM D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.4.7 In-place density tests should be conducted in accordance with ASTM D6938 at a frequency of at least:

Area	Minimum Test Frequency
Building Pad Areas	1 test per 2,500 square feet per compacted lift
Utility Lines	1 test per 150 feet per compacted lift

9.4.8 Recycled materials (such as asphaltic concrete or Portland cement concrete) should not be used within 10 feet of any improvement without approval by the Owner. Contractors should not assume that recycled materials can be used in preparing bids for the project without approval by the owner, and the

Geotechnical Engineer. Recycled materials cannot be used in the proposed building pads.

9.4.9 Aggregate base shall comply with State of California Department of Transportation requirements for Caltrans Class 2 aggregate base, with the exception that aggregate base below the buildings shall not contain recycled materials. Documentation that the aggregate base to be used for the project meets the Class 2 material requirements (R-value, gradation, sand equivalent, durability, etc.) and is free of recycled materials, where planned below the building, should be provided to the Owner. All aggregate base should be compacted to a minimum of 95 percent relative compaction.

9.4.10 Open graded gravel and rock material such as ¾-inch crushed rock or ½-inch crushed rock should not be used as backfill including trench backfill. In the event gravel or rock is required by a regulatory agency for use as backfill, all open graded materials shall be fully encased in a geotextile filter fabric, such as Mirafi 140N, to prevent migration of fine grained soils into the porous material.

9.5 Shallow Spread Foundations

9.5.1 Shallow spread foundations for the proposed multi-purpose building should be supported on engineered fill prepared as recommended in the "Site Preparation" section of this report. Shallow spread foundations for the multi-purpose building, supported on engineered fill as recommended in this report, may be designed based on a maximum net allowable soil bearing pressure of 2,500 pounds per square foot for dead-plus-live loads, with a one-third increase for transient loads such as wind or seismic.

9.5.2 Grade beams or continuous foundations used for the seismic rehabilitation of existing buildings may be supported directly on the native or fill soils. A net allowable soil bearing pressure of 2,500 pounds per square foot (for dead-plus-live loads), may be used for design, with a one-third increase for transient loads such as wind or seismic.

9.5.3 Based on information reviewed as part of this investigation, the existing building foundations are comprised of approximate four foot square and two foot deep footings at each building corner and pilaster. It is also our understanding that the buildings have no perimeter foundations between the isolated footings. The foundation type for the seismic upgrades should be evaluated by the structural engineer relative to the existing foundation system and the estimated static and seismic settlements included in this report.

9.5.4 Perimeter footings for the multi-purpose building shall have a minimum depth of 30 inches below the lowest final adjacent site grade. The foundations should be continuous around the perimeter of all structures to reduce moisture migration beneath the structure. Continuous perimeter foundations should be extended through doorways and/or openings that are not needed for support of loads. Interior foundations for the multi-purpose building should have a minimum depth of 18 inches below the bottom of the slab on grade.

9.5.5 At a minimum, foundations and/or grade beams for seismic upgrades to the existing buildings should extend to the depths of the existing foundations, or to at least 18 inches below site grade, whichever is deeper. If the new foundations and/or grade beams exert static pressures on the subgrade, an additional settlement of the proximal existing foundations of ¼ inch should be anticpated. Once the structural plans and loads have been determined, this information should be provided to Moore Twining to assess whether any significant settlement to existing foundations would occur as a result of new foundation loads.

9.5.6 New foundations should be designed and reinforced for the anticipated differential settlements and heave. A structural engineer experienced in foundation design should recommend the thickness, design details and concrete specifications for the foundations based on a total static settlement of 1 inch, a differential static settlement of ½ inch in 40 feet, a differential seismic settlement of ¼ inch in 40 feet, and heave of up to 1 inch total and ½ inch differential in 40 feet should also be anticipated in design.

9.5.7 The following values were developed using the Ground Motion Parameter Calculator provided by United States Geological Survey (http://earthquake.usgs.gov/) in accordance with the 2010 CBC. The site is located at roughly 36.842 degrees latitude and -121.532 degrees longitude.

Item	CBC Value
Site Class	D
Spectral Response At Short Period (0.2 Second), Ss	2.235
Spectral Response At 1-Second Period, S_1	1.282
Site Coefficient, Fa	1.0
Site Coefficient, Fv	1.5
Maximum considered earthquake spectral response acceleration for short period, SM_S	2.235

Maximum considered earthquake spectral response acceleration for 1 second, SM_1	1.923
Five percent damped design spectral response acceleration for short period, SD_S	1.490
Five percent damped design spectral response acceleration at 1-second period, SD_1	1.282

9.5.8 Foundation excavations should be observed by Moore Twining prior to the placement of steel reinforcement and concrete to verify conformance with the intent of the recommendations of this report.

9.5.9 The moisture content of the footing excavations should be maintained at least one percent above the optimum moisture content of the native clays by the contractor until placement of concrete. If the excavations are allowed to dry, conditioning and remedial measures should be conducted to establish moisture contents of at least optimum moisture.

9.6 Frictional Coefficient and Passive Earth Pressure

9.6.1 The bottom surface area of concrete footings or concrete slabs in direct contact with engineered fill can be used to resist lateral loads. An allowable coefficient of friction of 0.30, can be used for design. In areas where slabs are underlain by a synthetic moisture barrier, an allowable coefficient of friction of 0.10, can be used for design.

9.6.2 The allowable passive resistance of the engineered fill may be assumed to be equal to the pressure developed by a fluid with a density of 300 pounds per cubic foot. The upper 6 inches of subgrade in landscape areas should be neglected in determining the total passive resistance.

9.6.3 This report does not include recommendations for retaining walls. Retaining walls are not anticipated for this project. If future plans require retaining walls, our firm should be contacted to provide recommendations for retaining walls.

9.7 Interior Concrete Slab-on-Grade

The slabs-on-grade on the project that should be prepared as interior slabs include: the floor slab of the multi-purpose building and any concrete flatwork directly adjacent to the building.

9.7.1 The recommendations provided herein are intended only for the design of interior concrete slabs-on-grade and their proposed uses, which do not include construction traffic (i.e., cranes, concrete trucks, and rock trucks, etc.). The building contractor should assess the slab section and determine its adequacy to support any proposed construction traffic.

9.7.2 A structural engineer experienced in slab-on-grade design should recommend the thickness, design details and concrete specifications for the proposed slabs-on-grade for a total static settlement of 1 inch, a differential static settlement of ½ inch in 40 feet, a differential seismic settlement of ¼ inch in 40 feet and heave of ½ inch, and heave of up to 1 inch total and ½ inch differential in 40 feet.

9.7.3 Interior slabs-on-grade should be placed on a minimum of 6 inches of non-recycled Class 2 aggregate base (compacted to a minimum of 95 percent relative compaction) placed over at least 18 inches of imported non-expansive fill soils meeting the recommendations under section 9.4 of this report.

9.7.4 The moisture content of the engineered fill below the imported non-expansive section should be verified to be within one (1) to four (4) percent above optimum moisture content prior to placing the imported non-expansive section.

9.7.5 The slabs and underlying subgrade should be constructed in accordance with current American Concrete Institute (ACI) standards.

9.7.6 ACI recommends that the interior slab-on-grade should be placed directly on a vapor retarder when the potential exists that the underlying subgrade or sand layer could be wet or saturated prior to placement of the slab-on-grade. It is recommended that Stegowrap 15 or equivalent should be used where floor coverings, such as carpet and tile, are anticipated or where moisture could permeate into the interior and create problems. The layer of Stegowrap 15 should overlay 6 inches of compacted AB. It should be noted that placing the PCC slab directly on the vapor barrier will increase the potential for cracking and curling; however, ACI recommends the placement of the vapor retarding membrane directly below the slab to reduce the amount vapor emission through the slab-on-grade. Based on discussions with Stego Industries, L.L.C. (telephone 949-493-5460), the Stegowrap can be placed directly on the AB and the concrete can be placed directly on the Stegowrap. It is recommended that the design professional obtain written confirmation from Stego Industries that this product is suitable for the specific project application. It is recommended that the slab be moist cured for a minimum of 7 days to reduce the potential for excessive cracking. The underslab membrane should have a high puncture resistance (minimum of approximately 2,400 grams of puncture resistance), high abrasion resistance, rot resistant, and mildew resistant. It is recommended that the membrane be selected in accordance with the current ASTM C 755, Standard Practice For Selection of Vapor Retarder For Thermal Insulation and conform to the current ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Waters, or as Ground Cover. It is recommended that the vapor barrier selection and installation conform to the current ACI Manual of Concrete Practice, Guide for Concrete Floor and Slab Construction (302.1R), Addendum, Vapor Retarder Location and current ASTM E 1643, Standard Practice for Installation of Water Vapor Retarders Used In Contact with Earth or Granular Fill Under Concrete Slabs. In addition, it is recommended that the manufacturer of the floor covering and floor covering adhesive be consulted to determine if the manufacturers have additional recommendations regarding the design and construction of the slab-on-grade, testing of the slab-on-grade, slab preparation, application of the adhesive, installation of the floor covering and maintenance requirements. It should be noted that the recommendations presented in this report are not intended to achieve a specific vapor emission rate.

9.7.7 The membrane should be installed so that there are no holes or uncovered areas. All seams should be overlapped and sealed with the manufacturer approved tape, continuously at the laps so they are vapor tight. All perimeter edges of the membrane, such as pipe penetrations, interior and exterior footings, joints, etc., should be sealed per manufacturer's recommendations.

9.7.8 Tears or punctures that may occur in the membrane should be repaired prior to placement of concrete per the manufacturer's recommendations. Once repaired, the membrane should be inspected by the Contractor and the owner to verify adequate compliance with manufacture's recommendations.

9.7.9 The manufacturer's requirements vary regarding the surface and cover material around the placed membrane. Vapor retarding membranes should be installed in accordance with the manufacturers' specifications.

9.7.10 The membrane is not required beneath exposed concrete floors provided that moisture intrusion into the strictures permissible for the design life of the structure.

9.7.11 Additional measures to reduce moisture migration should be implemented if moisture sensitive floor coverings (such as wood or vinyl) are used. These include: 1) constructing a less pervious concrete floor slab by maintaining a low water-cement ratio as recommended by ACI in the concrete for slabs-on-grade; 2) moist cure the slab for at least 7 days; 3) ensuring that all seams and utility protrusions are sealed with tape to create a "water tight" moisture retarding membrane; 4) placing concrete walkways or pavements adjacent to the structure; 5) locating lawns, planters and flower beds away from the structure; and 6) providing adequate drainage away from the structure sat a minimum two percent slope. In addition, water should not be allowed to pond adjacent to the structure.

9.7.12 It should be noted that the placement and compaction of the Class 2 AB, the vapor retarding membrane installation, protection, etc., and the placement, curing, etc. of concrete should be in accordance with the project geotechnical engineering report, applicable ACI requirements, the manufacturer's requirements, the project plans, the project specifications, whichever is most stringent.

9.7.13 The Contractor shall test the moisture vapor transmission through the slab, the pH, internal relative humidity, etc., at a frequency and methods as specified by the flooring manufacturer or as required by the plans and specifications, whichever is most stringent. The results of vapor transmission tests, pH tests, internal relative humidity tests, ambient building conditions, etc. should be within floor manufacturer's and adhesive manufacturer's specifications at the time the floor is placed. It is recommended that the floor manufacturer and subcontractor review and approve the test data prior to floor covering installation.

9.7.14 To reduce the potential for damaging slabs during construction the following recommendations are presented for the multi-purpose building: 1) design for a differential slab movement of ½ inch relative to interior columns; 2) provide at least 6 inches of compacted aggregate base below the slabs, 3) The loaded track and/or pad pressure of any crane or construction equipment which will operate on slabs should be evaluated by the contractor prior to loading the slab.

9.7.15 Backfill the zone above the top of footings at interior column locations, building perimeters, and below the bottom of slabs with an approved backfill and/or an aggregate base section as recommended herein for the area below interior slabs-on-grade. This procedure should provide more uniform support for the slabs which may reduce the potential for cracking.

9.8 <u>Exterior Slabs-On-Grade</u>

The recommendations for exterior slabs provided below are not intended for use for slabs subjected to vehicular traffic. The following recommendations are intended only for lightly loaded sidewalks, walkways and slabs for pedestrian traffic which are not located next to the buildings.

9.8.1 Exterior improvements that are planned directly adjacent to the multi-purpose building and exterior improvements that subject the subgrade soils to a sustained load greater than 150 pounds per square foot should be prepared in accordance with the recommendations presented in this report for the interior floor slabs (see under section 9.7). The concrete should be cast free from adjacent foundations or other non-heaving edge restraints using expansion joint material.

9.8.2 Exterior slabs outside the building pad preparation limits should be supported on a minimum of 12 inches of imported, non-expansive engineered fill, over subgrade soils prepared as recommended in the "Site Preparation" section of this report. If any city, county, and/or state standards are cited on the plans or specifications, these standards should be in addition to the recommendations in this report.

9.8.3 The moisture content of the engineered fill below the imported non-expansive section should be verified to be within one (1) to four (4) percent above optimum moisture content prior to placing the imported non-expansive section.

9.8.4 There is a potential for differential swell of slabs on grade to occur where interior slabs meet exterior slabs (such as door stoops, etc.) resulting from differing subgrade preparation and varying thicknesses of non-expansive fill. In order to reduce this potential, the lateral extent of the granular, imported fill recommended below the interior slab-on-grade at the multi-purpose building should include the concrete walks, stoops, etc. adjacent to the new building.

9.8.5 Due to the potential for differential swell of slabs on grade to occur where new and replacement door stoops and exterior walkways meet the interior slabs of the existing buildings to be seismically upgraded, site preparation should be conducted as recommended in section 9.3.4 of this report, and non-expansive soils (see sections 9.4.3 and 9.4.4 of this report) should be placed as engineered fill within the upper 12 inches below new or replacement concrete door stoops or walkways, and within 2 feet laterally of edges of these improvements.

9.8.6 The concrete slabs-on-grade outside the multi-purpose building pad preparation limits and the exterior slabs for new and replacement stoops and exterior walkways to be constructed in conjunction with the seismic upgrades of the existing buildings should be designed with thickened edges. The thickened edges should extend to the bottom of the non-expansive soil section below the slabs (min. 12 inches), or deeper as determined by the designer. This should reduce the potential for infiltration of water into the aggregate base below these slabs.

9.8.7 If the subgrade is prepared, and then disturbed by equipment workers, weather or other sources, we recommend that the exposed subgrade to receive slabs be tested to verify adequate compaction. If adequate compaction is not verified, the disturbed non-expansive subgrade should be over-excavated, scarified, and compacted as engineered fill.

9.8.8 Since exterior sidewalks, curbs, etc. are typically constructed at the end of the construction process, the moisture conditioning conducted during earthwork can revert to natural dry conditions. Placing concrete walks and finish work over dry or slightly moist subgrade should be avoided. It is recommended that the general Contractor notify Moore Twining Associates to conduct in-place moisture and density tests prior to placing aggregate base and concrete flatwork. Written test results indicating passing density and moisture tests should be in the general Contractor's possession prior to placing concrete for exterior flatwork.

9.9 Temporary Excavations

9.9.1 It is the responsibility of the Contractor to provide safe working conditions with respect to excavation slope stability. The Contractor is responsible for site slope safety, and classification of materials for excavation purposes, and maintaining slopes in a safe manner during construction. The grades classification and height recommendations presented for temporary slopes are for consideration in preparing budget estimates and evaluating construction procedures.

9.9.2 Temporary excavations should be constructed in accordance with CAL OSHA requirements. As a minimum, temporary cut slopes should not be steeper than 1½ to 1, horizontal to vertical, and flatter if possible. If excavations cannot meet these criteria, the temporary excavations should be shored.

9.9.3 Excavations adjacent to existing slabs and foundations could undermine foundation support and damage existing structures. However, excavations for the seismic upgrades will be required in several areas directly adjacent to existing foundations and slabs. Unsupported excavations shall not be conducted below a 1.5 horizontal to 1 vertical plane from the bottom of existing foundations, grade beams, or slabs unless the excavations are conducted in alternating, limited width slots. Thus, if the new foundations or grade beams for the seismic upgrades of the existing buildings require excavation below the 1.5 horizontal to 1 vertical plane, special procedures such as limited width slot cutting or temporary underpinning of existing foundations may be required by the contractor in order to install the foundations/grade beams. The maximum width of the alternating, limited width slots adjacent to existing foundations and slabs (width measurement is parallel with the existing building line adjacent to the excavation) should be determined by the structural engineer and included on the project plans. The contractor will need to determine the requirements for shoring, underpinning, and slot cutting, etc. based on the project plans and specifications and the recommendations of this report. The contractor should include in their bid the cost to slot cut (meeting the above limitations) or underpin.

9.9.4 Shoring systems, if used, should be designed by an engineer with experience in designing shoring systems and registered in the State of California. Shoring design should be based on the lateral earth pressures included in this report, temporary and permanent surcharge loads and hydrostatic pressures.

9.9.5 In no case should excavations extend below a 1.5H to 1V zone below existing utilities, foundations and/or floor slabs which are to remain after construction. Excavations which are required to be advanced below the 1.5H to 1V envelope should be shored to support the soils, foundations, and slabs.

9.9.6 Excavation stability should be monitored by the Contractor. Slope gradient estimates provided in this report do not relieve the Contractor of the responsibility for excavation safety. In the event that tension cracks or distress to the structure occurs, during or after excavation, the owners and Moore Twining should be notified immediately and the Contractor should take appropriate actions to prevent further damage or injury.

9.10 <u>Utility Trenches</u>

9.10.1 This report recommends non-expansive fill soil section below concrete slabs-on-grade within the building pad preparation limits and a non-expansive soil section below exterior concrete slabs. After trenching of utilities, the non-expansive sections should be re-established below the slabs to match the adjacent sections. In the event the excavated non-expansive soils are mixed with clayey soils, these materials will not be allowed as trench backfill within the non-expansive zone. The contractor is responsible to conduct the excavation and trench backfilling to meet the requirements of this report, including the upper portions of the trenches to reestablish the non-expansive sections to match the adjacent sections.

9.10.2 The utility trench subgrade should be prepared by excavation of a neat trench without disturbance to the bottom of the trench. If sidewalls are unstable, the Contractor shall either slope the excavation to create a stable sidewall or shore the excavation. All trench subgrade soils disturbed during excavation, such as by accidental over-excavation of the trench bottom, or by excavation equipment with cutting teeth, should be compacted to a minimum of 90 percent relative compaction prior to placement of bedding material. The Contractor is responsible for notifying Moore Twining when these conditions occur and arrange for Moore Twining to observe and test these areas prior to placement of pipe bedding. The Contractor shall use such equipment as necessary to achieve a smooth undisturbed native soil surface at the bottom of the trench with no loose material at the bottom of the trench. The Contractor shall either remove all loose soils or compact the loose soils as engineered fill prior to placement of bedding, pipe and backfill of the trench.

9.10.3 The trench width, type of pipe bedding, the type of initial backfill, and the compaction requirements of bedding and initial backfill material for utility trenches (storm drainage, sewer, water, electrical, gas, cable, phone, irrigation, etc.) should be specified by the project Civil Engineer or applicable design professional in compliance with the manufacturer's requirements, governing agency requirements and this report, whichever is more stringent. The contractor is responsible for contacting the governing agency to determine the requirements for pipe bedding, pipe zone and final backfill. The contractor is responsible for notifying the Owner and Moore Twining if the requirements of the agency and this report conflict, the most stringent applies. For flexible polyvinylchloride (PVC) pipes, these requirements should be in accordance with the manufacturer's requirements or ASTM D-2321, whichever is more stringent, assuming a hydraulic gradient exists (gravel, rock, crushed gravel, etc. cannot be used as backfill on the project). The width of the trench should provide a minimum clearance of 8 inches between the sidewalls of the pipe and the trench, or as necessary to provide a trench width that is 12 inches greater than 1.25 times the outside diameter of the pipe, whichever is greater. As a minimum, the pipe bedding should consist of 4 inches of compacted (92 percent relative compaction) select sand with a minimum sand equivalent of 30 and meeting the following requirements: 100 percent passing the 1/4 inch sieve, a minimum of 90 percent passing the No. 4 sieve and not more than 10 percent passing the No. 200 sieve. The bottom of the trench should be compacted as engineered fill prior to placement of the pipe bedding. The haunches and initial backfill (12 inches above the top of pipe) should consist of a select sand meeting these sand equivalent and gradation requirements that is placed in maximum 6-inch thick lifts and compacted to a minimum relative compaction of 92 percent using hand equipment. The final fill (12 inches above the pipe to the surface) may be on-site or imported, non-expansive materials moisture conditioned and compacted as engineered fill. The project civil engineer should take measures to control migration of moisture in the trenches such as slurry collars, etc.

9.10.4 Contractors should assume all bedding and initial backfill materials will need to consist of imported material that meets the recommendations provided in this report.

9.10.5 If ribbed or corrugated HDPE or metal pipes are used on the project, then the backfill should consist of select sand with a minimum sand equivalent of 30, 100 percent passing the 1/4 inch sieve, a minimum of 90 percent passing the No. 4 sieve and not more than 10 percent passing the No. 200 sieve. The sand shall be placed in maximum 6-inch thick lifts, extending to at least 1 foot above the top of pipe, and compacted to a minimum relative compaction of 92 percent using hand equipment. Prior to placement of the pipe, as a minimum, the pipe bedding should consist of 4 inches of compacted (92 percent relative compaction) sand meeting the above sand equivalent and gradation requirements for select sand bedding. The width of the trench should meet the requirements of ASTM D2321-00 listed in the table below (minimum manufacturer requirements). As an alternative to the trench width recommended above and the use of the select sand bedding, a lesser trench width for HDPE pipes may be used if the trench is backfilled with a 2-sack sand-cement slurry from the bottom of the trench to 1 foot above the top of the pipe.

Minimum Trench Widths for HDPE Pipe with Select Sand Backfill

Inside Diameter of HDPE Pipe (inches)	Outside Diameter of HDPE Pipe (inches)	Minimum Trench Width (inches) per ASTM D2321-00
12	14.2	30
18	21.5	39
24	28.4	48
36	41.4	64
48	55	80
60	67.3	96

9.10.6 Crushed gravel and rock for backfill is prohibited. Contractors should assume for the purpose of bid that no rock or gravel can be used for backfill on the project including utility trenches of any kind. In the event an open graded rock is required as backfill by a governing agency, the rock section should be fully encapsulated in an engineering filter fabric.

9.10.7 The contractor should use appropriate equipment and methods to avoid damage to utilities and/or structures during placement and compaction of the backfill materials.

9.10.8 Trench backfill should be placed, moisture conditioned, and compacted as engineered fill.

9.10.9 Jetting of trench backfill is not allowed to compact the backfill soils.

9.10.10 Storm drains and/or utility lines should be designed to be watertight. If encountered, leaks should be immediately repaired. Leaking storm drain and/or utility lines could result in trench failure, sloughing and/or soil heave causing damage to surface and subsurface structures, pavements, flatwork, etc. In addition, landscaping irrigation systems should be monitored for leaks. It is recommended that the pipelines be video inspected and pressure tested prior to placement of foundations, slabs-on-grade or pavements to verify that the pipelines are constructed properly and are watertight. The record of the video inspection along with a written description, prepared by the video inspection firm, of the condition of the pipe shall be provided to the Owner for review and approval.

9.10.11 Utility trenches should not be constructed within a zone defined by a line that extends at an inclination of 1.5 horizontal to 1 vertical downward from the bottom of building foundations (see section 9.9.3 of this report).

9.10.12 The project Civil Engineer should include slurry type cutoff collars along utility trenches at critical locations to prevent the migration of surface water into the trench and along the trench backfill material.

9.11 <u>Corrosion Protection</u>

9.11.1 Based on the ASTM Special Technical Publication 741 and the analytical results of sample analyses indicate the samples had resistivity values of 5,000 and 6,100 ohm-centimeters, with pH values of 8.4 and 8.3, respectively. Based on the resistivity values, the soils exhibit a “moderately corrosive” corrosion potential. Buried metal objects should be protected in accordance with the manufacturer's recommendations based on a “moderately corrosive” corrosion potential. The evaluation was limited to the effects of soils to metal objects; corrosion due to other potential sources, such as stray currents and groundwater, was not evaluated. If piping or concrete are placed in contact with deeper soils or engineered fill, these soils should be analyzed to evaluate the corrosion potential of these soils.

9.11.2 Corrosion of concrete due to sulfate attack is not anticipated based on the concentration of sulfates determined for the near-surface soils (0.0029 and 0.00073 percent by dry weight concentrations of sulfate). According to provisions of ACI 318, section 4.3 , the sulfate concentration falls in the negligible classification (0.00 to 0.10 percent by weight) for concrete. Therefore, no restrictions are required regarding the type, water-to-cement ratio, or strength of the concrete used for foundation and slabs are needed due to the sulfate content.

9.11.3 These soil corrosion data should be provided to the manufacturers or suppliers of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturers or suppliers cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e., a corrosion engineer, with experience in corrosion protection should be consulted to design parameters. Moore Twining is not a corrosion engineer; thus, cannot provide recommendations for mitigation of corrosive soil conditions. It is recommended that a corrosion engineer be consulted for the site specific conditions.

10.0 DESIGN CONSULTATION

10.1 Moore Twining should be provided the opportunity to review those portions of the contract drawings and specifications that pertain to earthwork and foundations prior to finalization to determine whether they are consistent with our recommendations. This service is not a part of this current contractual agreement.

10.2 It is the client's responsibility to provide plans and specification documents for our review prior to their issuance for construction bidding purposes.

10.3 If Moore Twining is not afforded the opportunity for review, we assume no liability for the misinterpretation of our conclusions and recommendations. This review should be documented by a formal plan/specification review report provided by Moore Twining Associates, Inc.

11.0 CONSTRUCTION MONITORING

11.1 It is recommended that Moore Twining be retained to conduct the necessary observation, field-testing services and provide results so that action necessary to remedy indicated deficiencies can be taken in accordance with the plans and specifications. Upon completion of the work, Moore Twining Associates, Inc. should provide a written summary of the observations, field testing and a final verified report with conclusions regarding the conformance of the completed work to the construction documents. This service is not, however, part of this current contractual agreement.

11.2 The construction monitoring is an integral part of this investigation. This phase of the work provides Moore Twining the opportunity to verify the subsurface conditions interpolated from the soil borings and make alternative recommendations if the conditions differ from those anticipated.

11.3 If the Moore Twining is not afforded the opportunity to provide engineering observation and field testing services during construction activities related to earthwork, foundations, pavements and trenches; then, Moore Twining will not be responsible for compliance of any aspect of the construction with our recommendations or performance of the structures or improvements if the recommendations of this report are not followed. We recommend that if a firm other than Moore Twining is selected to conduct these services that they provide evidence of professional liability insurance of at least $5,000,000 and review this report. After their review, the firm should, in writing, state that they understand and agree with the conclusions and recommendations of this report and agree to conduct sufficient observations and testing to ensure the construction complies with this report's recommendations. Moore Twining should be notified, in writing, if another firm is selected to conduct observations and field-testing services prior to construction.

11.4 Upon the completion of work, a final report should be prepared by Moore Twining. This report is essential to ensure that the recommendations presented are incorporated into the project construction, and to note any deviations from the project plans and specifications. The client should notify Moore Twining upon the completion of work to provide this report. This service is not, however, part of this current contractual agreement.

12.0 NOTIFICATION AND LIMITATIONS

12.1 The conclusions and recommendations presented in this report are based on the information provided regarding the proposed construction, and the results of the field and laboratory investigation, combined with interpolation of the subsurface conditions between boring locations.

12.2 The nature and extent of subsurface variations between borings may not become evident until construction.

12.3 If variations or undesirable conditions are encountered during construction, Moore Twining should be notified promptly so that these conditions can be reviewed and the recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

12.4 If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (more than 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

12.5 Changed site conditions, or relocation of proposed structures, may require additional field and laboratory investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

12.6 The conclusions and recommendations contained in this report are valid only for the project discussed in Section 3.4, “Existing and Anticipated Construction.” The use of the information and recommendations contained in this report for structures on this site not discussed herein or for structures on other sites not discussed in Section 3.1, “Site Description” is not recommended. The entity or entities that use or cause to use this report or any portion thereof for another structure or site not covered by this report shall hold Moore Twining, its officers and employees harmless from any and all claims and provide Moore Twining's defense in the event of a claim.

12.7 This report is issued with the understanding that it is the responsibility of the client to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

12.8 This report should not be construed as an environmental audit or study.

12.9 Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

12.10 This investigation report should not be used in the preparation of a Storm Water Pollution Prevention Plan (SWPPP). Use of this report or any data included in the report in preparation of an SWPPP would be at the owner's sole risk.

12.11 Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site are purchased by another party, the purchaser must obtain written authorization and sign an agreement with Moore Twining in order to rely upon the information provided in this report for design or construction of the project.

We appreciate the opportunity to be of service to Aromas-San Juan Unified School District. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Respectfully Submitted,

MOORE TWINING ASSOCIATES, INC.
Geotechnical Engineering Division

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STATE OF CALIFORNIA

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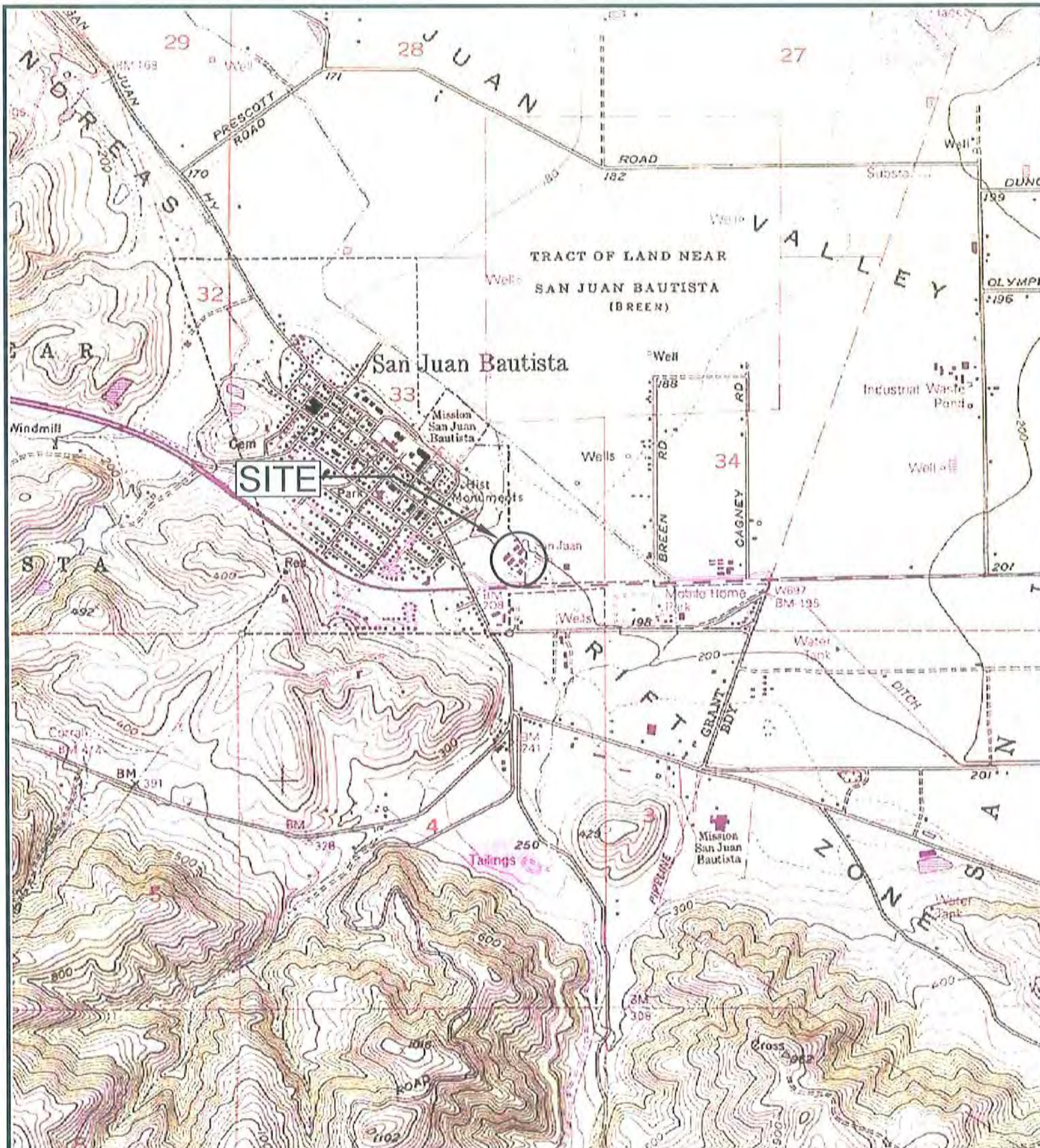
APPENDIX A

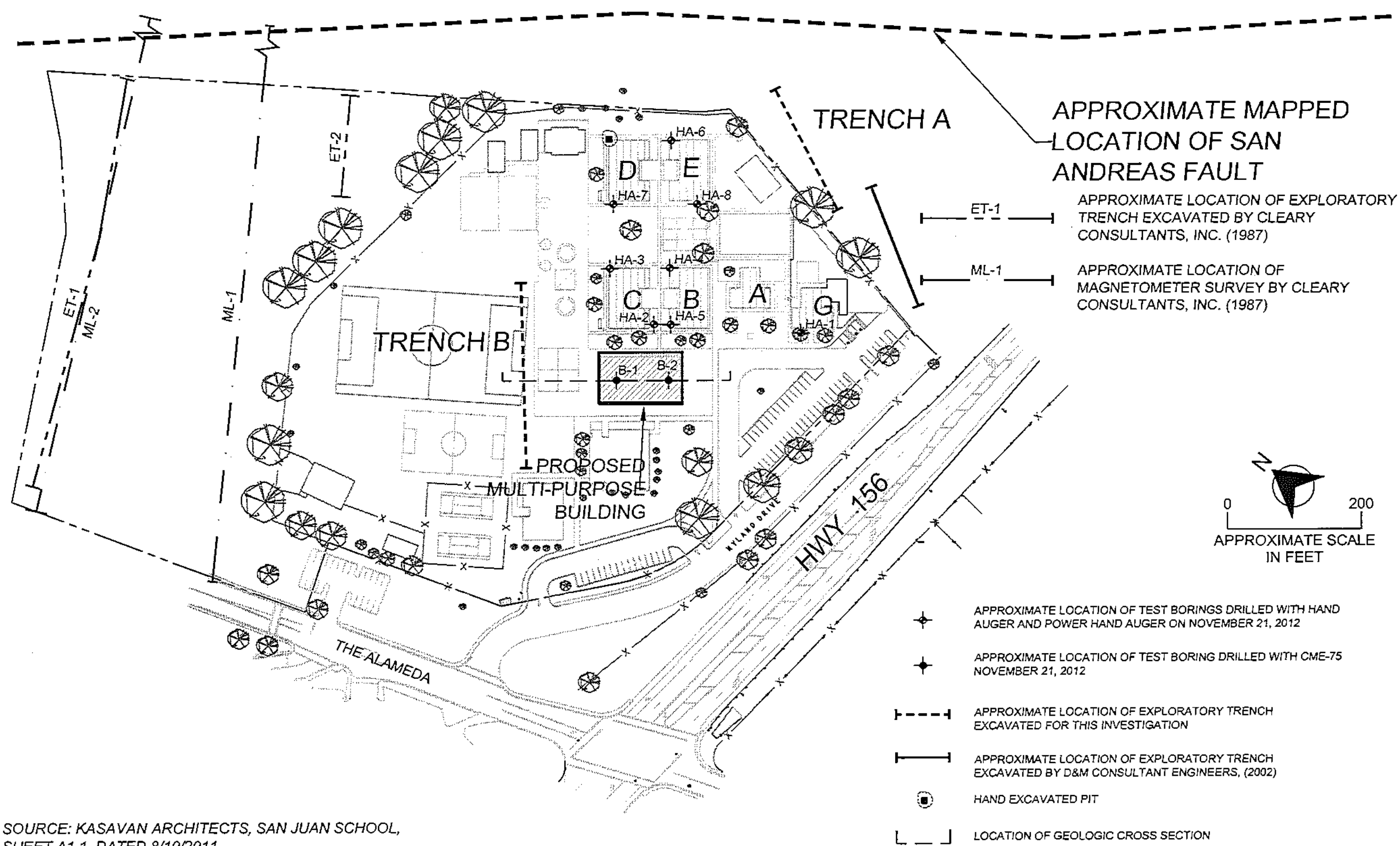
DRAWINGS



SOURCE: U.S.G.S. TOPOGRAPHIC MAP, 7 ½ MINUTE SERIES
SAN JUAN BAUTISTA, CALIFORNIA QUADRANGLE 1971, PHOTOREVISED 1993

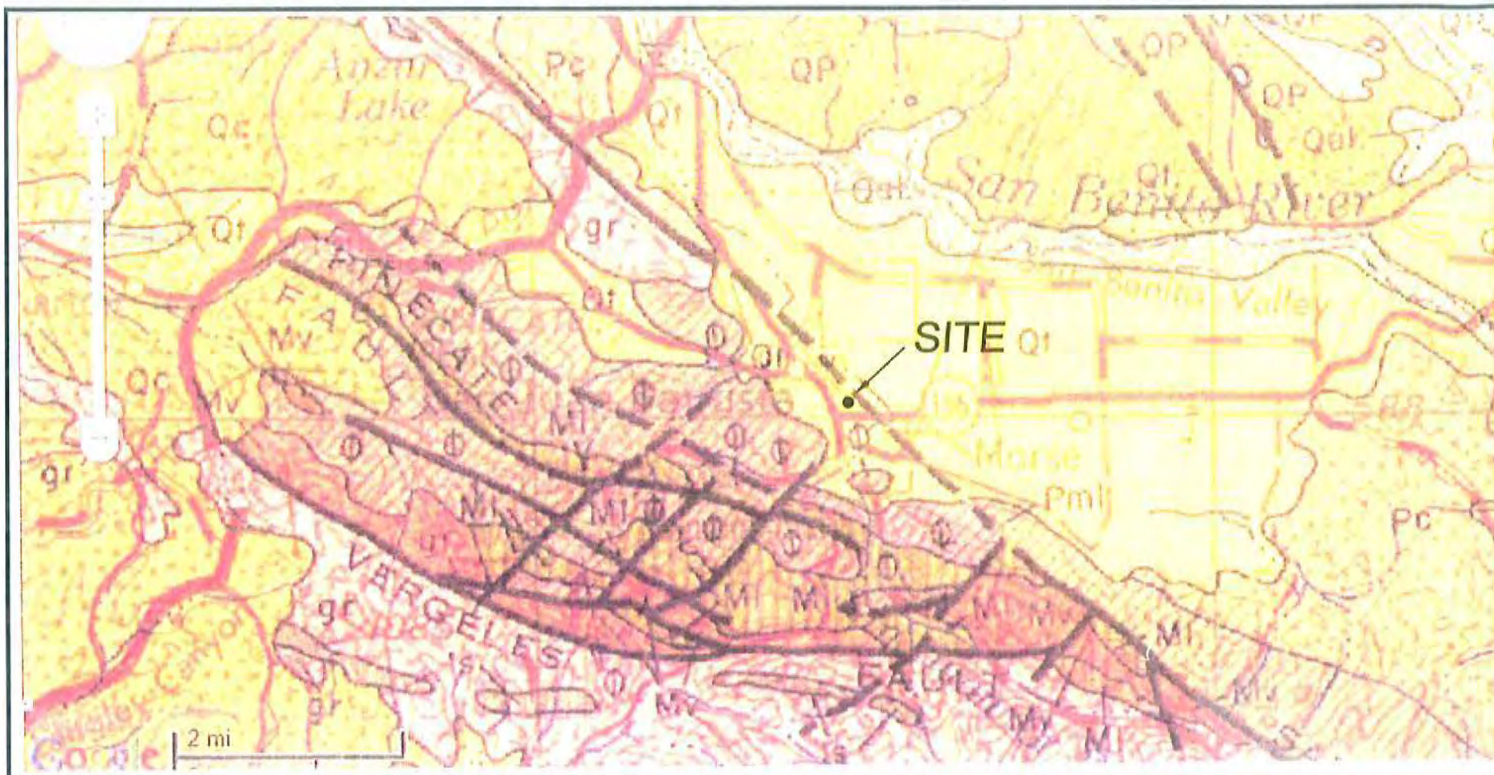
0 2000
APPROXIMATE SCALE IN FEET

SITE LOCATION MAP SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO.: 83701-01-01	DATE: 12/21/12	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.01	DRAWING NO. 1	



SOURCE: KASAVAN ARCHITECTS, SAN JUAN SCHOOL, SHEET A1.1, DATED 8/10/2011

SITE PLAN WITH TEST BORING AND FAULT TRENCH LOCATIONS SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-01-02	DATE DRAWN: 12/18/12	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY: [illegible]	
	PROJECT NO. E83701.01	DRAWING NO. 2	



GEOLOGIC ATLAS OF CALIFORNIA - SANTA CRUZ SHEET

California Geological Survey, Geologic Atlas of California Map No. 020, 1:250,000 scale

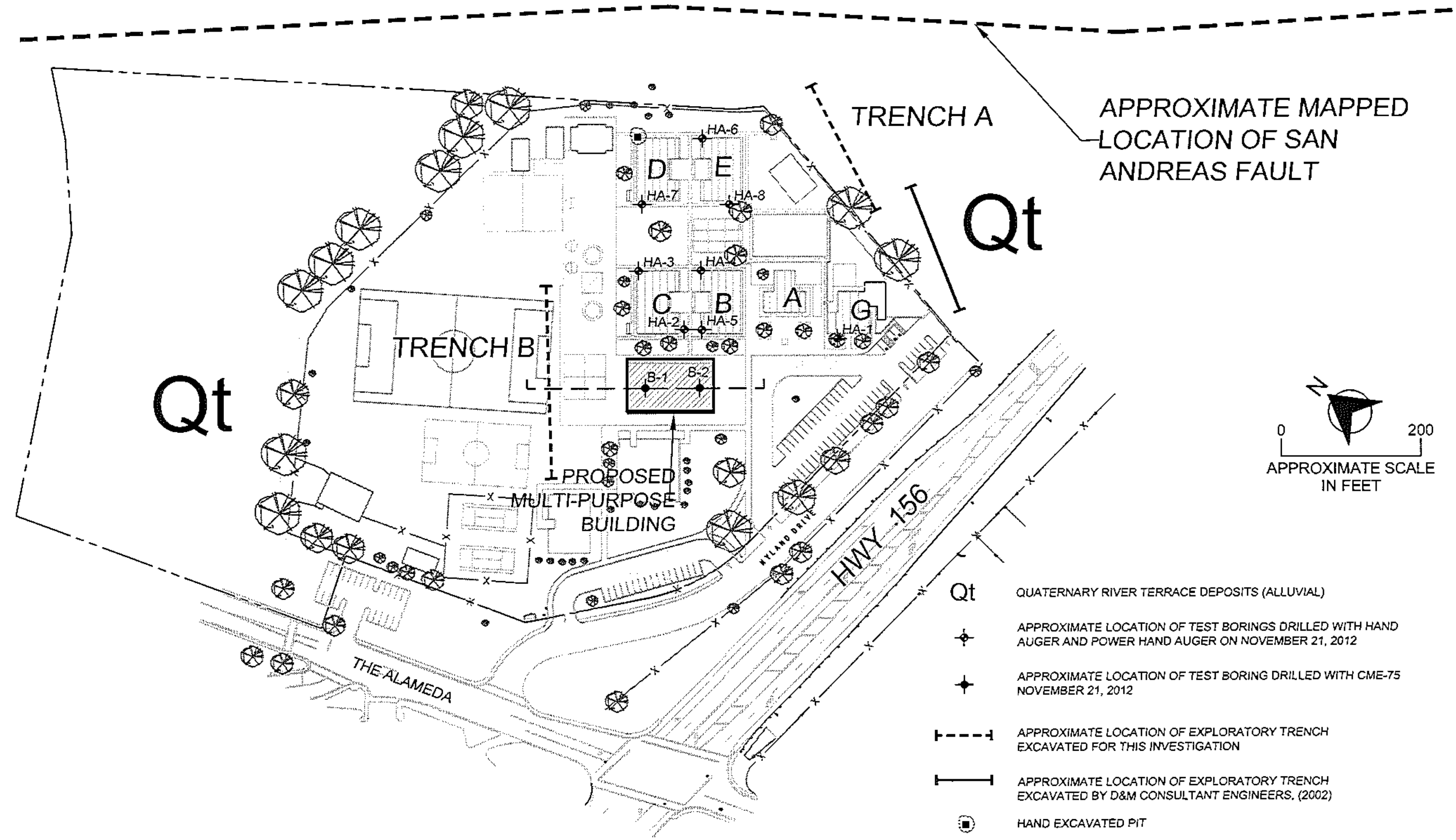
Compilation by: Charles W. Jennings and Rudolph G. Strand

1958

DESCRIPTION OF MAP UNITS

- Qs – Dune sand
- Qal – Alluvium
- Qsc – Stream channel deposits
- Qf – Fan deposits
- Qb – Basin deposits
- Qt – River terrace deposits
- Qm – Pleistocene marine and marine terrace deposits
- Qc – Pleistocene nonmarine
- QP – Plio-Pleistocene nonmarine
- Pc – Undivided Pliocene nonmarine
- Pu – Upper Pliocene marine
- Pmlc – Middle and/or lower Pliocene nonmarine
- Pml – Middle and/or lower Pliocene marine
- Muc – Upper Miocene nonmarine
- Mu – Upper Miocene marine
- Mmc – Middle Miocene nonmarine
- Mm – Middle Miocene marine
- Ml – Lower Miocene marine
- Mv – Miocene volcanic rocks: Mv[r]-rhyolite, Mv[a]-andesite, Mv[b]-basalt, Mv[p]-pyroclastic rocks
- Φc – Oligocene nonmarine
- Φ – Oligocene marine
- E – Eocene marine
- Ep – Paleocene marine
- Ti – Tertiary intrusive (hypabyssal) rocks: Ti[r]-rhyolite, Ti[a]-andesite, Ti[b]-basalt
- Ku – Upper Cretaceous marine
- Kl – Lower Cretaceous marine
- KJf – Franciscan group
- KJfv – Franciscan volcanic and metavolcanic rocks
- gr – Mesozoic granitic rocks
- ub – Mesozoic ultrabasic intrusive rocks
- ls – Pre-Cretaceous metamorphic rocks (ls=limestone)

REGIONAL GEOLOGIC MAP SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-01-02	DATE DRAWN: 12/18/12	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY: Vi	
	PROJECT NO. E83701.01	DRAWING NO. 3	



Qt QUATERNARY RIVER TERRACE DEPOSITS (ALLUVIAL)

APPROXIMATE LOCATION OF TEST BORINGS DRILLED WITH HAND AUGER AND POWER HAND AUGER ON NOVEMBER 21, 2012

APPROXIMATE LOCATION OF TEST BORING DRILLED WITH CME-75 NOVEMBER 21, 2012

APPROXIMATE LOCATION OF EXPLORATORY TRENCH EXCAVATED FOR THIS INVESTIGATION

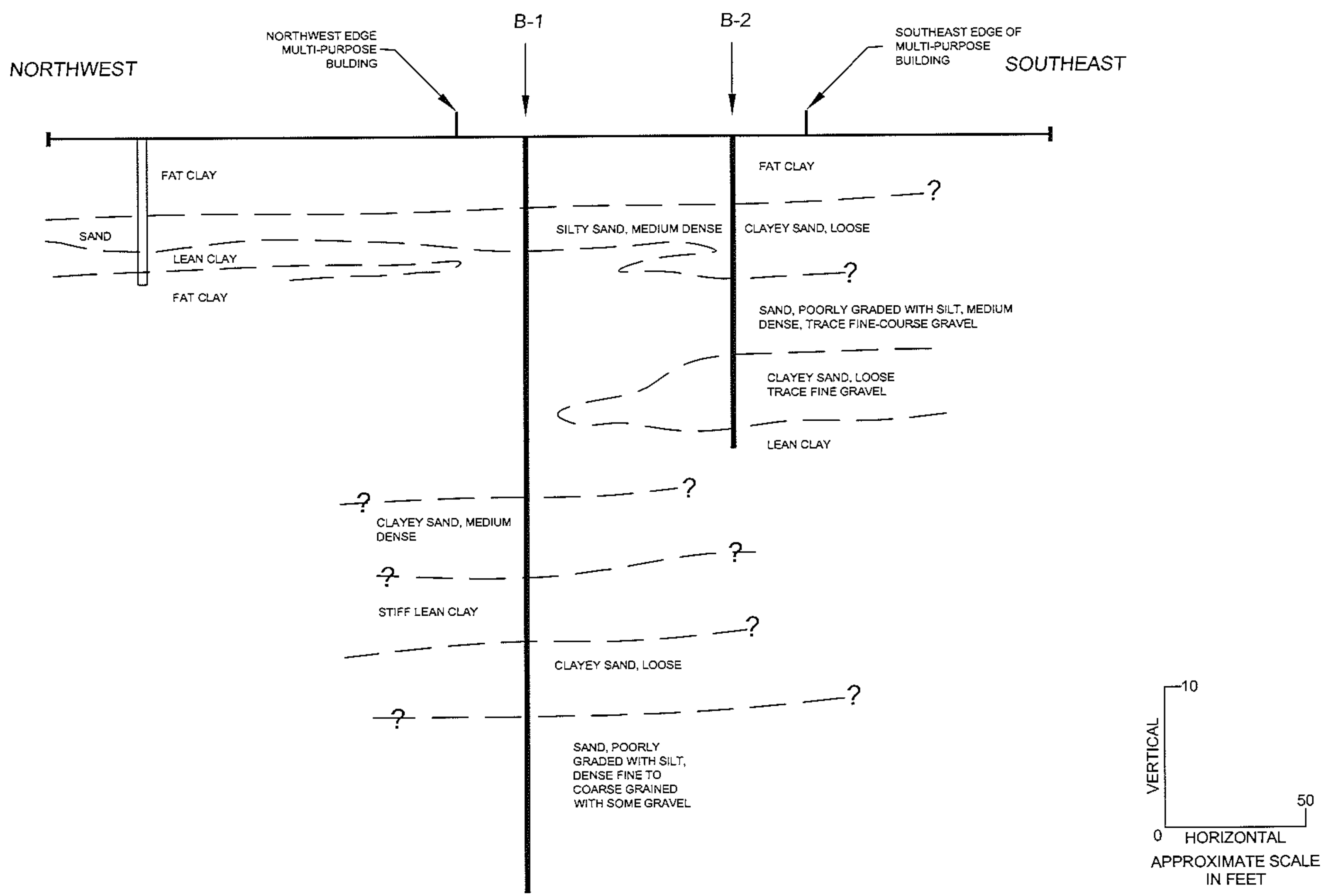
APPROXIMATE LOCATION OF EXPLORATORY TRENCH EXCAVATED BY D&M CONSULTANT ENGINEERS, (2002)

HAND EXCAVATED PIT

LOCATION OF GEOLOGIC CROSS SECTION

SOURCE: KASAVAN ARCHITECTS, SAN JUAN SCHOOL, SHEET A1.1, DATED 8/10/2011

SITE GEOLOGIC MAP SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-01-02	DATE DRAWN: 12/18/12	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY: KC	
	PROJECT NO. E83701.01	DRAWING NO. 4	



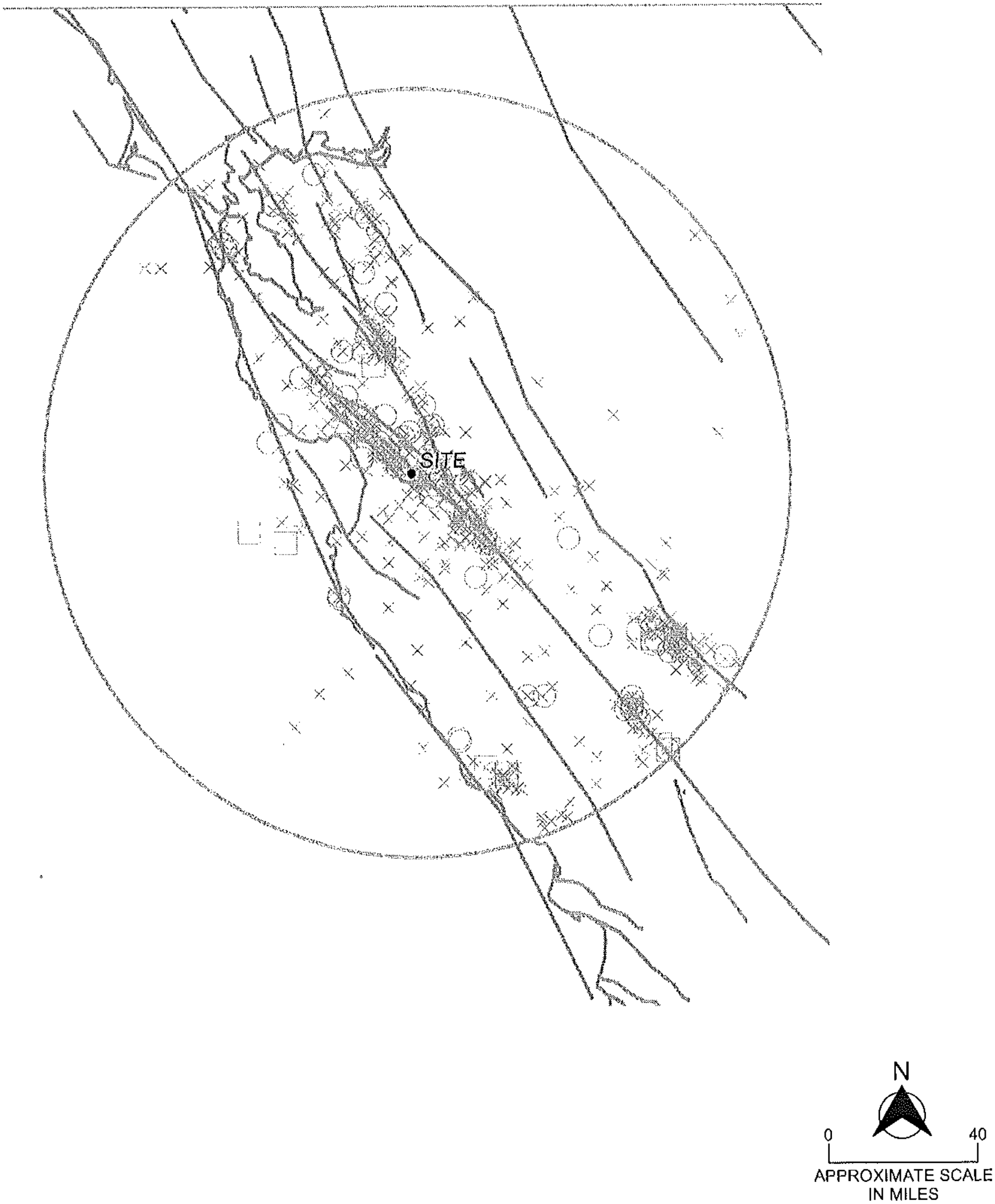
SOIL PROFILE CROSS -SECTION
SAN JUAN SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

FILE NO. 83701-01-02	DATE DRAWN: 12/18/12
DRAWN BY: RM	APPROVED BY: KE
PROJECT NO. E83701.01	DRAWING NO. 5

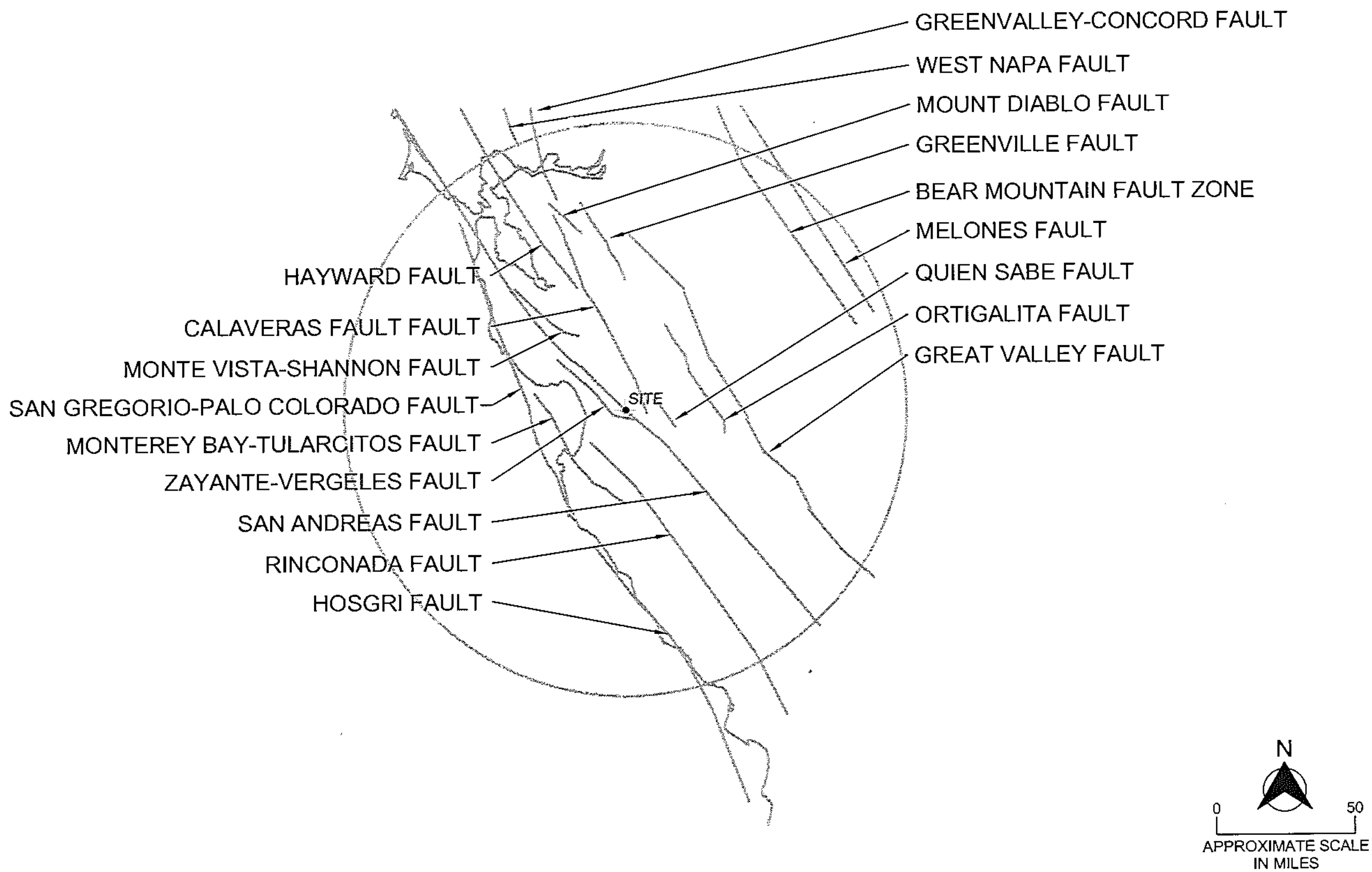
MOORE TWINING ASSOCIATES, INC.

EARTHQUAKE EPICENTER MAP

San Juan School



HISTORICAL EARTHQUAKE EPICENTER MAP SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-01-02	DATE DRAWN: 12/18/12	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY: RL	
	PROJECT NO. E83701.01	DRAWING NO. 6	



MAPS OF ACTIVE AND POTENTIALLY ACTIVE FAULTS RELATIVE TO SITE SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-01-02	DATE DRAWN: 12/21/12	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY: RC	
	PROJECT NO. E83701.01	DRAWING NO. 7	

APPENDIX B

LOGS OF BORINGS

This appendix contains the final logs of borings. These logs represent our interpretation of the contents of the field logs and the results of the field and laboratory tests.

The logs and related information depict subsurface conditions only at these locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these test boring locations. Also, the passage of time may result in changes in the soil conditions at these test boring locations.

In addition, an explanation of the abbreviations used in the preparation of the logs and a description of the Unified Soil Classification System are provided at the end of Appendix B.

MOORE TWINING ASSOCIATES, INC.

Test Boring: B-1

Project: San Juan School

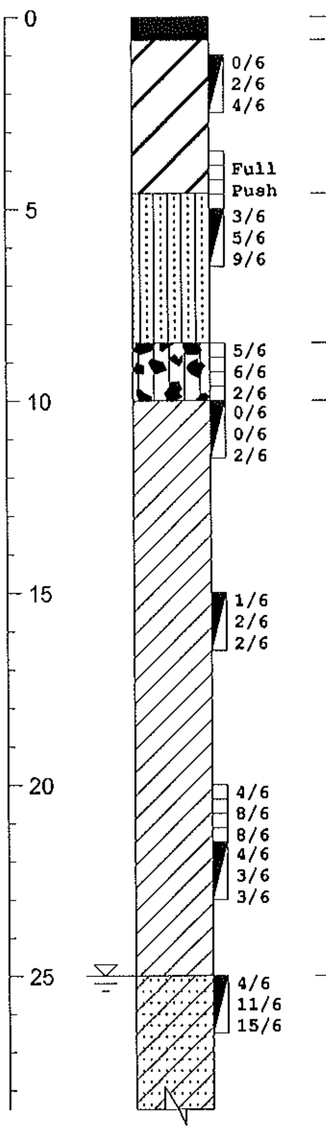
Project Number: E83701.01

Drilled By: JS | **Logged By:** AR

Drill Type: CME 75 | **Date:** 11/21/12

Auger Type: 6 5/8" O.D. | **Elevation:** NA

Hammer Type: 140 lb Trip | **Depth to Groundwater:** 25 Feet*



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		AC	Asphaltic Concrete = 4 inches over Aggregate Base = 3 inches			
	0/6 2/6 4/6	CH	FAT CLAY; Medium stiff, moist, high plasticity, dark brown to black	EI = 72 pH = 8.4 SR = 5000 ohms-cm cl = < 0.00060 SS = 0.0029 DD = 112.1 pcf Non-Plastic	6	21.5
	Full Push		Sandy, brown		--	7.6
5	3/6 5/6 9/6	SM	SAND, Silty; Medium dense, damp, fine to coarse grained, brown, trace fine gravel		14	5.1
	5/6 6/6 2/6	GM	GRAVEL, Silty, with Sand; Loose, damp, fine to coarse, brown		8	14.5
10	0/6 0/6 2/6	CL	LEAN CLAY, with Sand; Very soft, moist, low to medium plasticity, brown, trace fine gravel		2	19.0
15	1/6 2/6 2/6		Soft, no gravel		4	28.1
20	4/6 8/6 8/6		Medium stiff, sandy, olive	DD = 117.7 pcf LL = 47 PI = 28	16	16.4
	4/6 3/6 3/6				6	
25	4/6 11/6 15/6	SC	SAND, Clayey; Medium dense, wet, fine to coarse grained, brown, trace fine to coarse gravel		26	

Notes: ** Groundwater encountered at 25 feet BSG. Measured at 15 feet BSG approximately 2 hours after termination of boring.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: B-1

Project: San Juan School

Project Number: E83701.01

Drilled By: JS

Logged By: AR

Drill Type: CME 75

Date: 11/21/12

Auger Type: 6 5/8" O.D.

Elevation: NA

Hammer Type: 140 lb Trip

Depth to Groundwater: 25 Feet*

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
30	3/6 4/6 6/6	CL	LEAN CLAY, with Sand; Stiff, wet, low to medium plasticity, dark brown with red striping		10	
35	2/6 2/6 3/6	SC	SAND, Clayey; Loose, moist, fine to medium grained, brown	-200 = 42.2%	5	
40	18/6 22/6 41/6	SP-SM	SAND, Poorly Graded, with Silt; Dense, wet, fine to coarse grained, brown, trace fine gravel	DD = 119.8 pcf	63	14.4
	11/6 22/6 25/6				47	
45	11/6 22/6 34/6		Very dense		56	
50	10/6 14/6 17/6		Dense Gray		31	
			Bottom of boring at 51.5 feet BSG.			
55						

Notes: ** Groundwater encountered at 25 feet BSG. Measured at 15 feet BSG approximately 2 hours after termination of boring.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: B-2

Project: San Juan School

Project Number: E83701.01

Drilled By: JS

Logged By: AR

Drill Type: CME 75

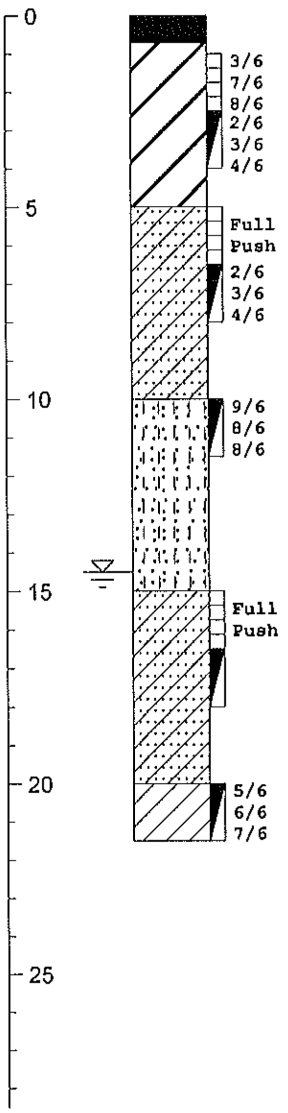
Date: 11/21/12

Auger Type: 6 5/8" O.D.

Elevation: NA

Hammer Type: 140 lb Trip

Depth to Groundwater: 14.5 Feet



ELEVATION/ DEPTH (feet)	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0	AC	Asphaltic Concrete = 4 inches over Aggregate Base = 2.5 inches			
	CH	FAT CLAY; Medium stiff, moist, high plasticity, dark brown to black Calcification		15 7	
5	SC	SAND, Clayey; Loose, moist, fine to medium grained, brown	ø = 34° c = 410 psf	-- 7	
10	SP-SM	SAND, Poorly Graded, with Silt; Medium dense, damp, fine to coarse grained, brown, trace fine to coarse gravel		16	
15	SC	SAND, Clayey; Loose, wet, fine to coarse grained, brown, trace fine gravel Increase in percent fines content at 16.5' BSG 4 inch layer of lean clay at 17' BSG	-200 = 26.2%	--	6
20	CL	LEAN CLAY, Sandy; Stiff, wet, low to medium plasticity, brown, trace fine gravel		13	
		Bottom of boring at 21.5 feet BSG.			

Notes: * *Groundwater encountered at 14.5 feet BSG. Measured at 14 feet BSG approximately 15 minutes after termination of boring.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-1

Project: San Juan School

Project Number: E83701.01

Drilled By: AR **Logged By:** AR

Drill Type: Hand Auger **Date:** 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger **Elevation:** NA

Hammer Type: N/A **Depth to Groundwater:** NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Clayey; Moist, fine to medium grained, dark brown			
		Fill	SAND, Poorly Graded, with Silt; damp, fine to coarse grained, dark gray	-200 = 45.9%		15.1
5		SC	SAND, Clayey; Moist, fine to medium grained, dark brown Trace fine gravel at 4.5'	pH = 8.3 SR = 6100 ohms-cm cl = <0.00060 SS = 0.00073		10.1
			Auger refusal at 5.2 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-2

Project: San Juan School

Project Number: E83701.01

Drilled By: AR

Logged By: AR

Drill Type: Hand Auger

Date: 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger

Elevation: NA

Hammer Type: N/A

Depth to Groundwater: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		SC	SAND, Clayey; Moist, fine to medium grained, dark brown			
			At 1.5 feet 4" layer with gravel Brown, trace fine gravel	-200 = 48.1%		13.3
			Decrease in percent clay with depth	EI = 41 LL = 41 PI = 24		10.7
5			Auger refusal at 4.3 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: HA-3

Project: San Juan School

Project Number: E83701.01

Drilled By: KC | **Logged By:** KC

Drill Type: Hand Auger | **Date:** 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger | **Elevation:** NA

Hammer Type: N/A | **Depth to Groundwater:** NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Clayey; Moist, dark brown, appears soft Sandy, yellowish brown, fine to coarse grained sand	-200 = 45.9%		12.8
		SM	SAND, Silty; Moist, fine grained, with trace clay, yellowish brown No notable clay, fine to medium grained With coarse gravel, granictic, rounded to subrounded, friable			7.7
5			Auger refusal at 5 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-4

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Logged By: KC

Drill Type: Hand Auger

Date: 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger

Elevation: NA

Hammer Type: N/A

Depth to Groundwater: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	LEAN CLAY, Sandy; Moist, dark brown			4.4
		SM	SAND, Silty, Damp, reddish brown, very coarse sand, some fine to coarse gravel			
5			Auger refusal at 5 feet BSG due to gravel			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-5

Project: San Juan School

Project Number: E83701.01

Drilled By: KC **Logged By:** KC

Drill Type: Hand Auger **Date:** 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger **Elevation:** NA

Hammer Type: N/A **Depth to Groundwater:** NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Silty, Fine to medium grained, damp, dark brown			
		FILL	LEAN CLAY; Low plasticity, moist, dark brown			12.0
		FILL	Mixture silty sand, moist, dark brown, and lean clay, moist, dark brown, appears loose/soft.			8.8
5		CL	LEAN CLAY, Sandy; Moist, yellowish brown, with coarse sand, appears loose With fine to coarse gravel, granitic, subrounded			
10			Auger refusal at 4.5 feet BSG due to gravel.			
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-6

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Logged By: KC

Drill Type: Hand Auger

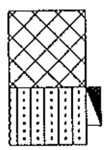
Date: 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger

Elevation: NA

Hammer Type: N/A

Depth to Groundwater: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Silty; Moist, fine grained, dark brown Yellowish brown, damp, trace clay			7.9
		SM	SAND, Silty; Damp, fine grained, yellowish brown Fine to coarse grained, with fine gravel			
5			Auger refusal at 3.5 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-7

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Logged By: KC

Drill Type: Hand Auger

Date: 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger

Elevation: NA

Hammer Type: N/A

Depth to Groundwater: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Silty; Moist, fine to medium grained, dark brown			
		SM	SAND, Silty; Moist, fine to very coarse grained, with trace clay, yellowish brown Scattered coarse gravel			
			Auger refusal at 3 feet BSG due to gravel			
5						
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-8

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Logged By: KC

Drill Type: Hand Auger

Date: 11/21/12

Auger Type: 4" Hand Auger & 2-Man Power Auger

Elevation: NA

Hammer Type: N/A

Depth to Groundwater: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	LEAN CLAY; Moist, low to medium plasticity, dark brown to black, roots≤1/4			
		FILL	SAND, Silty; moist, fine to medium grained, brown, trace fine to coarse gravel, some cobbles			
		SP	SAND, Poorly Graded; Damp, medium to coarse grained, yellowish brown, trace fine to coarse gravel, trace cobbles			
5						
			Auger refusal at 4 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Asphaltic Concrete
	High plasticity clay
	Silty sand
	Silty gravel
	Low plasticity clay
	Clayey sand
	Poorly graded sand with silt
	Fill
	Poorly graded sand
Misc. Symbols	
	Water table during drilling
	Boring continues

Notes:

1. Test borings were drilled on 11/21/12 using a CME-75 Drill Rig equipped with 6-5/8" O.D. Hollow Stem Augers, and Hand Auger equipment.

2. Groundwater was encountered in the boring(s)

3. Test boring locations were located by measuring tape with reference to the existing features.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. The "N-value" reported for the California Modified Split Barrel Sampler is the uncorrected field blow count. This value should not be interpreted as an SPT equivalent N-value.

6. Results of tests conducted on samples recovered are reported on the logs. Abbreviations used are:

DD =	Natural dry density (pcf)	LL =	Liquid Limit (%)
UC =	Unconfined compression (psf)	PI =	Plasticity Index (%)
-4 =	Percent passing #4 sieve (%)	pH =	Soil pH
-200 =	Percent passing #200 sieve (%)	SS =	Soluble sulfates (%)
SR =	Soil resistivity (ohm-cm)	Cl =	Soluble chlorides (%)
c =	Cohesion (psf)	ø =	Angle of internal friction (degrees)
TS =	Field Torvane Shear Strength test (tons per square foot)	N/A =	Not applicable
pcf =	pounds per cubic foot	N/E =	Not encountered
psf =	pounds per square foot	AMSL =	Above Mean Sea Level
O.D. =	Outside Diameter		

KEY TO SYMBOLS

Symbol Description

<u>Soil Samplers</u>

 Standard penetration test

 California Modified split barrel ring sampler

 Bulk/Grab sample

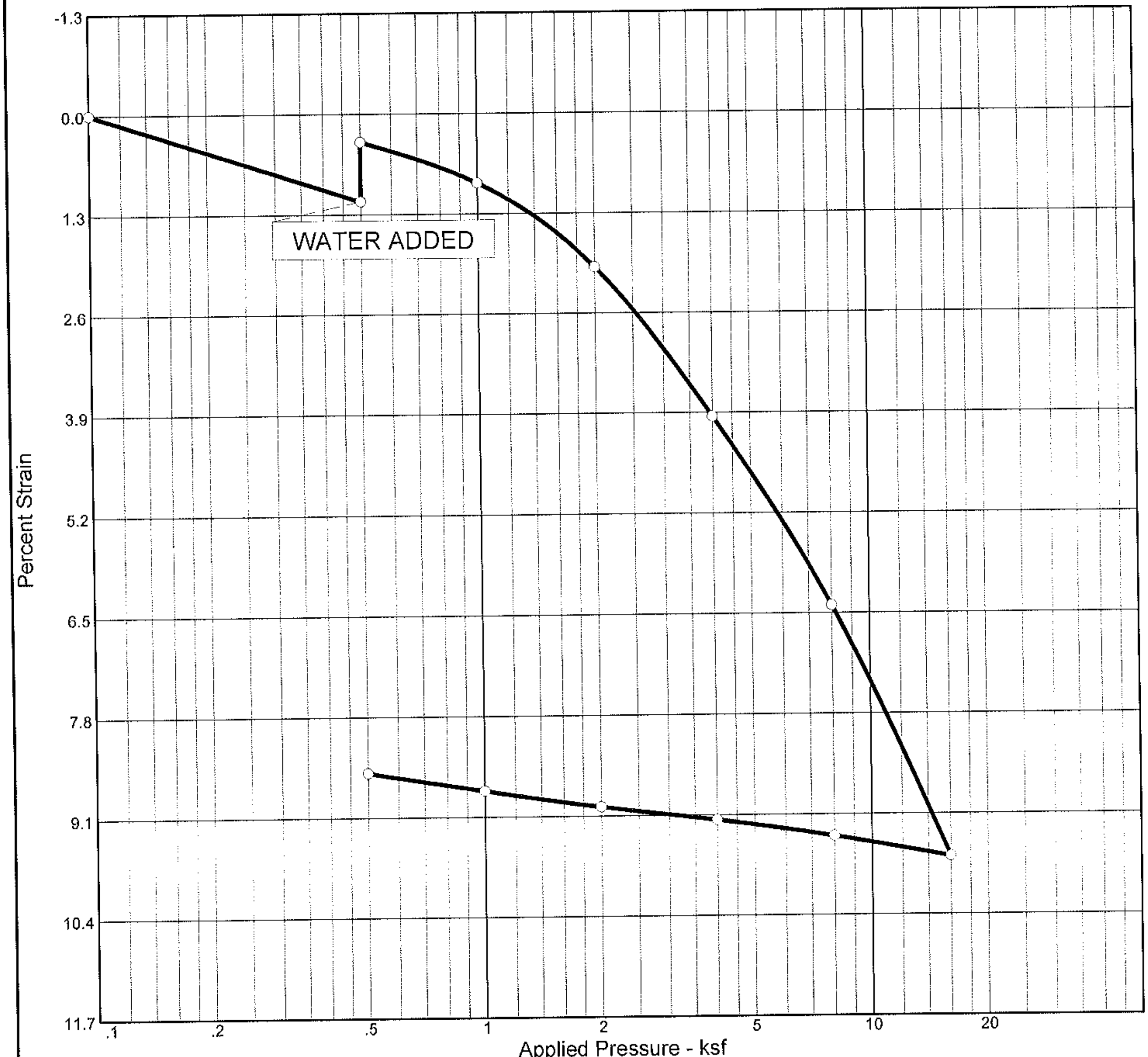
APPENDIX C

RESULTS OF LABORATORY TESTS

This appendix contains the individual results of the following tests. The results of the moisture content and dry density tests are included on the test boring logs in Appendix B. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

These Included:	To Determine:
Moisture Content (ASTM D2216)	Moisture contents representative of field conditions at the time the sample was taken.
Dry Density (ASTM D2216)	Dry unit weight of sample representative of in-situ or in-place undisturbed condition.
Consolidation (ASTM D2435)	The amount and rate at which a soil sample compresses when loaded, and the influence of saturation on its behavior.
Direct Shear (ASTM D3080)	Soil shearing strength under varying loads and/or moisture conditions.
Grain-Size Distribution (ASTM D422)	Size and distribution of soil particles, i.e., sand, gravel and fines (silt and clay).
Expansion Index (ASTM D5968)	Swell potential of soil with increases in moisture content
Atterberg Limits (ASTM D4318)	The consistency and "stickiness," as well as the range of moisture contents within which the material is "workable
Sulfate Content (ASTM D4327)	Percentage of water-soluble sulfate as (SO4) in soil samples. Used as an indication of the relative degree of sulfate attack on concrete and for selecting the cement type.
Chloride Content (ASTM D4327)	Percentage of soluble chloride in soil. Used to evaluate the potential attack on encased reinforcing steel.
Resistivity (ASTM D1125)	The potential of the soil to corrode metal.
pH (ASTM D4972)	The acidity or alkalinity of subgrade material.

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_s	Swell Press. (ksf)	Swell %	e_o
Sat.	Moist.											
87.2 %	21.7 %	99.7			2.65		3.76	0.18	0.01	1.22	0.7	0.659

MATERIAL DESCRIPTION	USCS	AASHTO

Project No. E83701.01 **Client:**

Project: San Juan School

Source: **Sample No.:** B-2 **Elev./Depth:** 1-2.5'

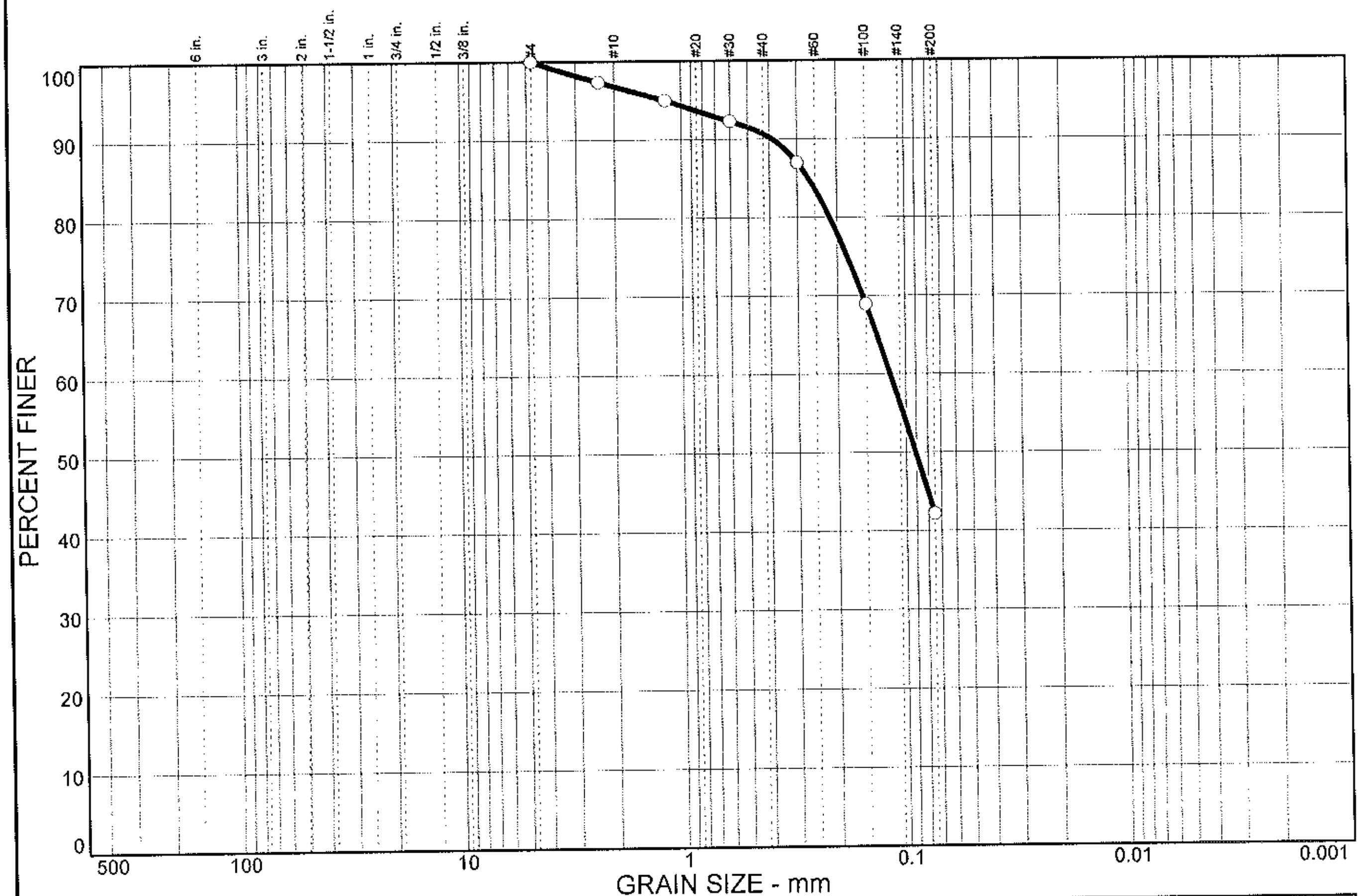
Moore Twining Associates, Inc.

Fresno, CA

Remarks:

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	3.2	6.1	48.5	42.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	97.4		
#16	95.0		
#30	92.3		
#50	87.0		
#100	68.9		
#200	42.2		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.268 D_{60}= 0.117 D_{50}= 0.0910
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=0.59

Sample No.: B-1
Location:

Source of Sample: San Juan School

Date: 11/21/12
Elev./Depth: 35-36.5'

Moore Twining Associates, Inc.

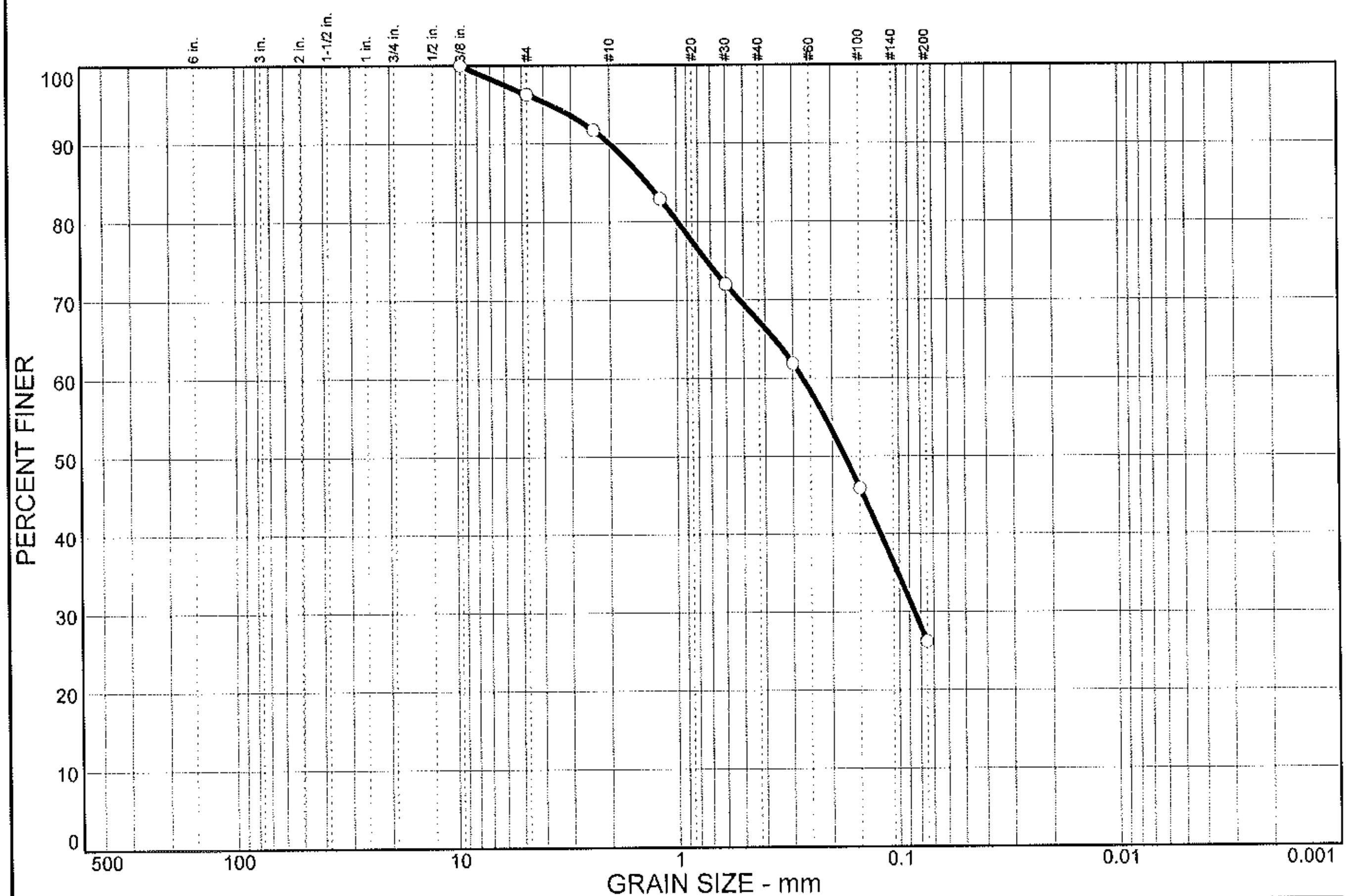
Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School

Project No: E83701.01

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	3.7	6.3	22.8	41.0	26.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	96.3		
#8	91.7		
#16	82.9		
#30	72.0		
#50	61.9		
#100	45.9		
#200	26.2		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.36 D_{60}= 0.271 D_{50}= 0.175
D_{30}= 0.0854 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

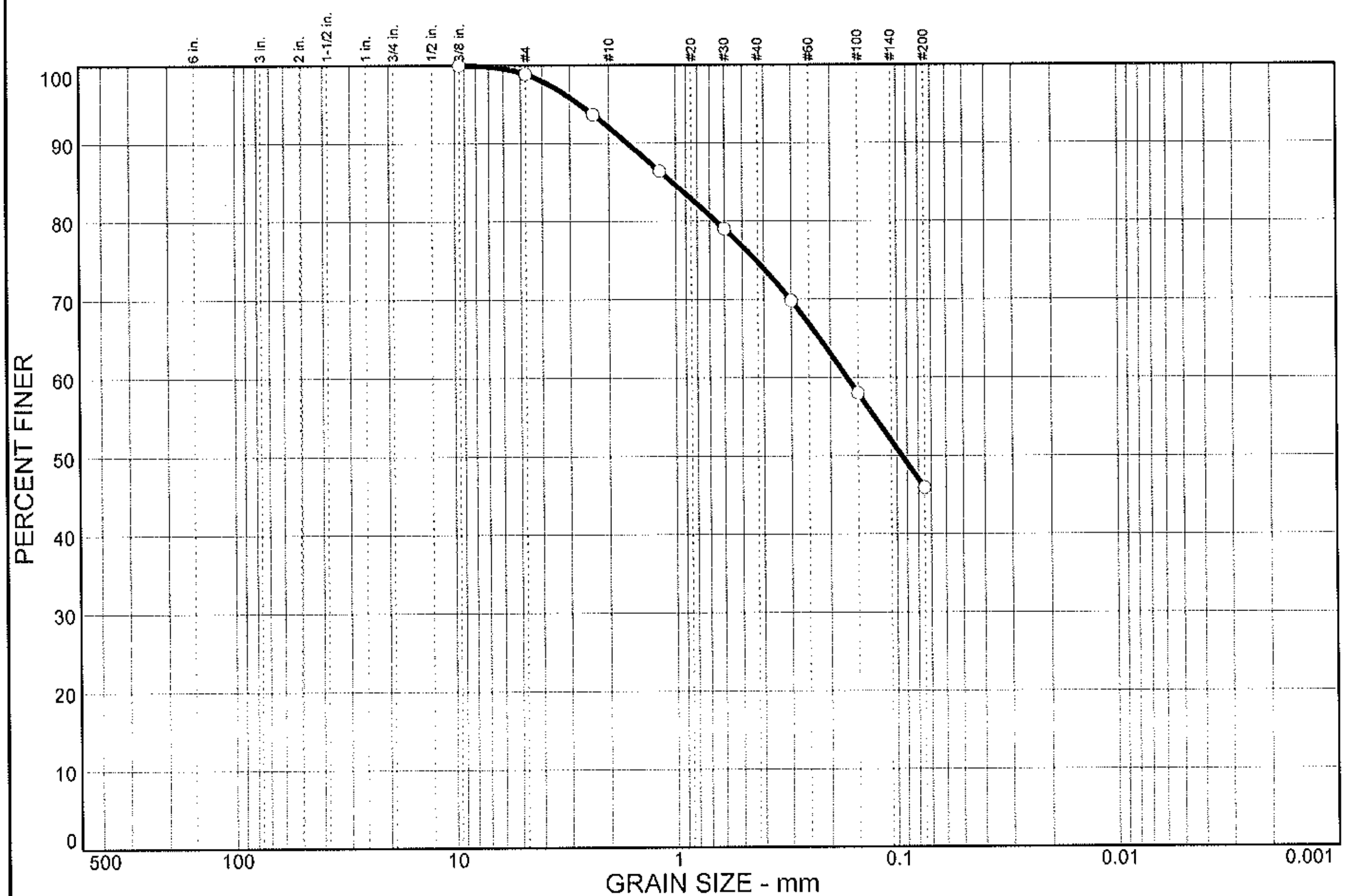
Remarks

F.M.=1.49

Sample No.: B-2 **Source of Sample:** San Juan School **Date:** 11/21/12
Location: **Elev./Depth:** 15-16.5'

Moore Twining Associates, Inc. **Fresno, CA**	**Client:** **Project:** Fault Trench Investigation at San Juan School **Project No:** E83701.01 **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.1	6.9	17.3	28.8	45.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	98.9		
#8	93.7		
#16	86.4		
#30	79.0		
#50	69.8		
#100	58.0		
#200	45.9		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.04 D_{60}= 0.168 D_{50}= 0.0950
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=1.14

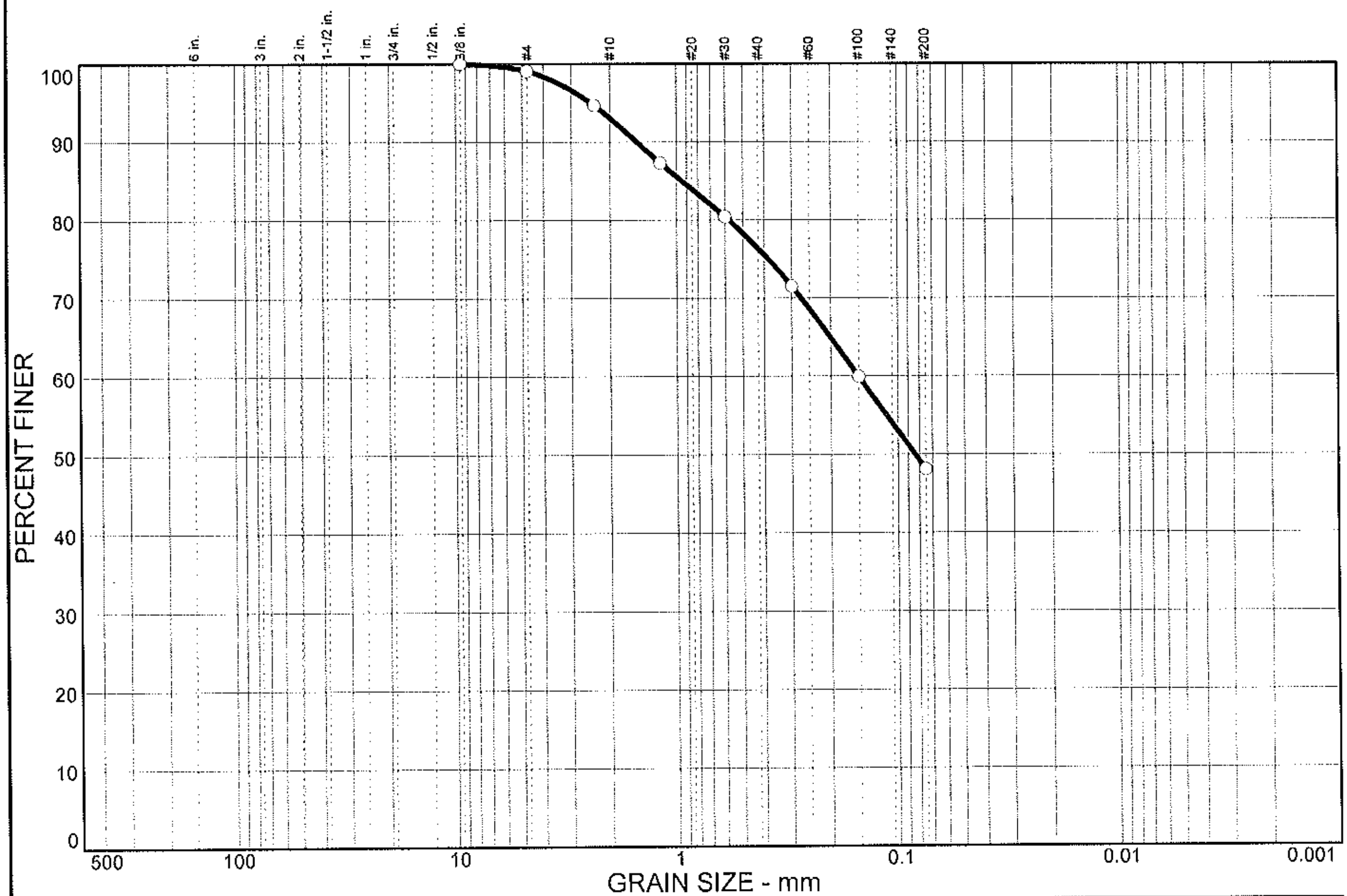
Sample No.: HA-1 **Source of Sample:** San Juan School **Date:** 11/21/12
Location: **Elev./Depth:** 2.5-3'

Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School
Project No: E83701.01 **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.9	6.0	16.7	28.3	48.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	99.1		
#8	94.7		
#16	87.3		
#30	80.4		
#50	71.5		
#100	59.9		
#200	48.1		

* (no specification provided)

Material Description

Clayey sand

Atterberg Limits

PL= 17 LL= 41 PI= 24

Coefficients

D_{85}= 0.943 D_{60}= 0.151 D_{50}= 0.0839
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO=

Remarks

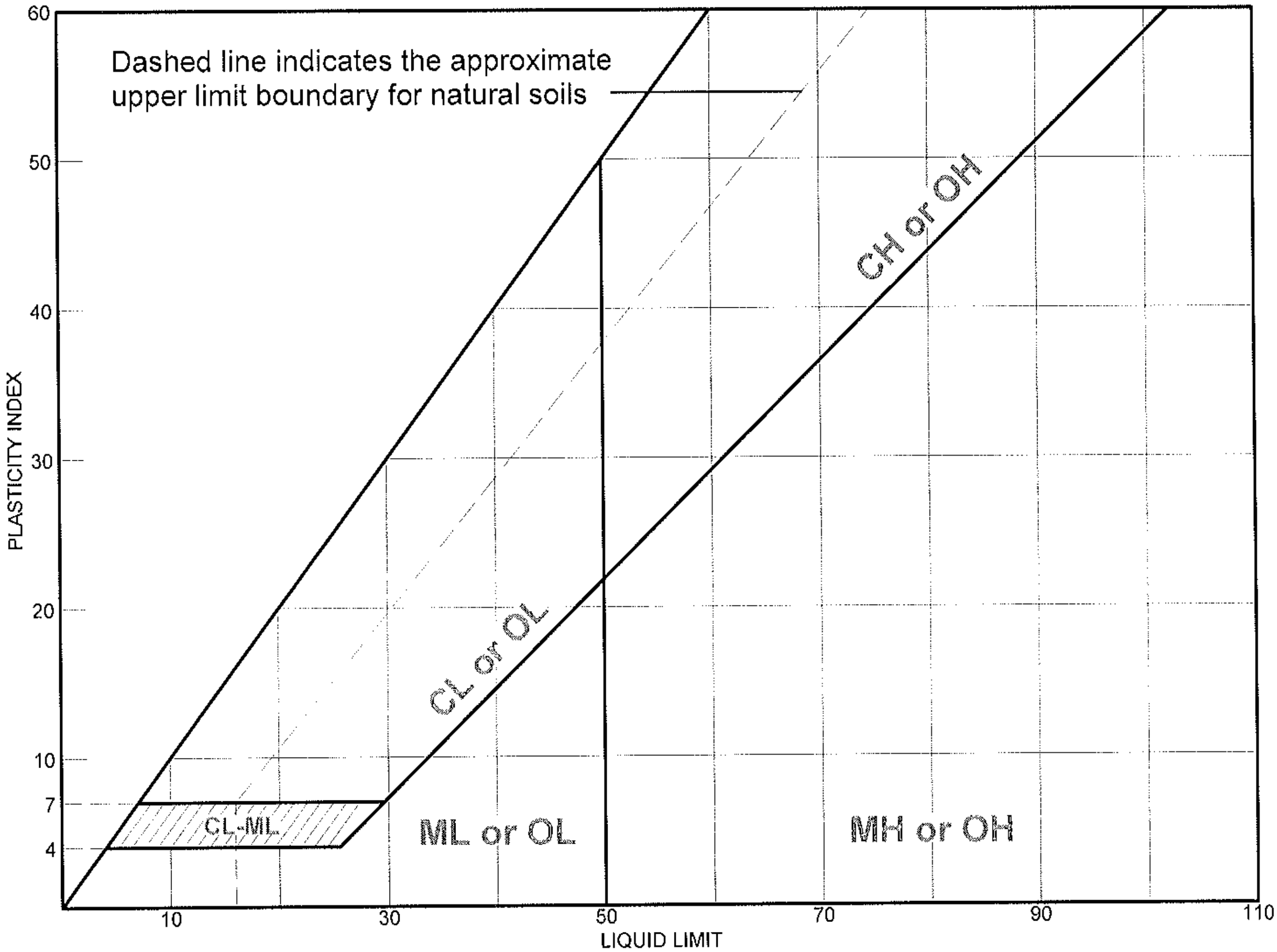
F.M.=1.07

Sample No.: HA-2 **Source of Sample:** San Juan School **Date:** 11/21/12
Location: **Elev./Depth:** 2-2.5'

Moore Twining Associates, Inc.
Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School
Project No: E83701.01 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		NV	NP	NP			

Project No. E83701.01 **Client:**

Project: San Juan School

● **Source:** San Juan School **Sample No.:** B-1 **Elev./Depth:** 5-6.5'

Remarks:

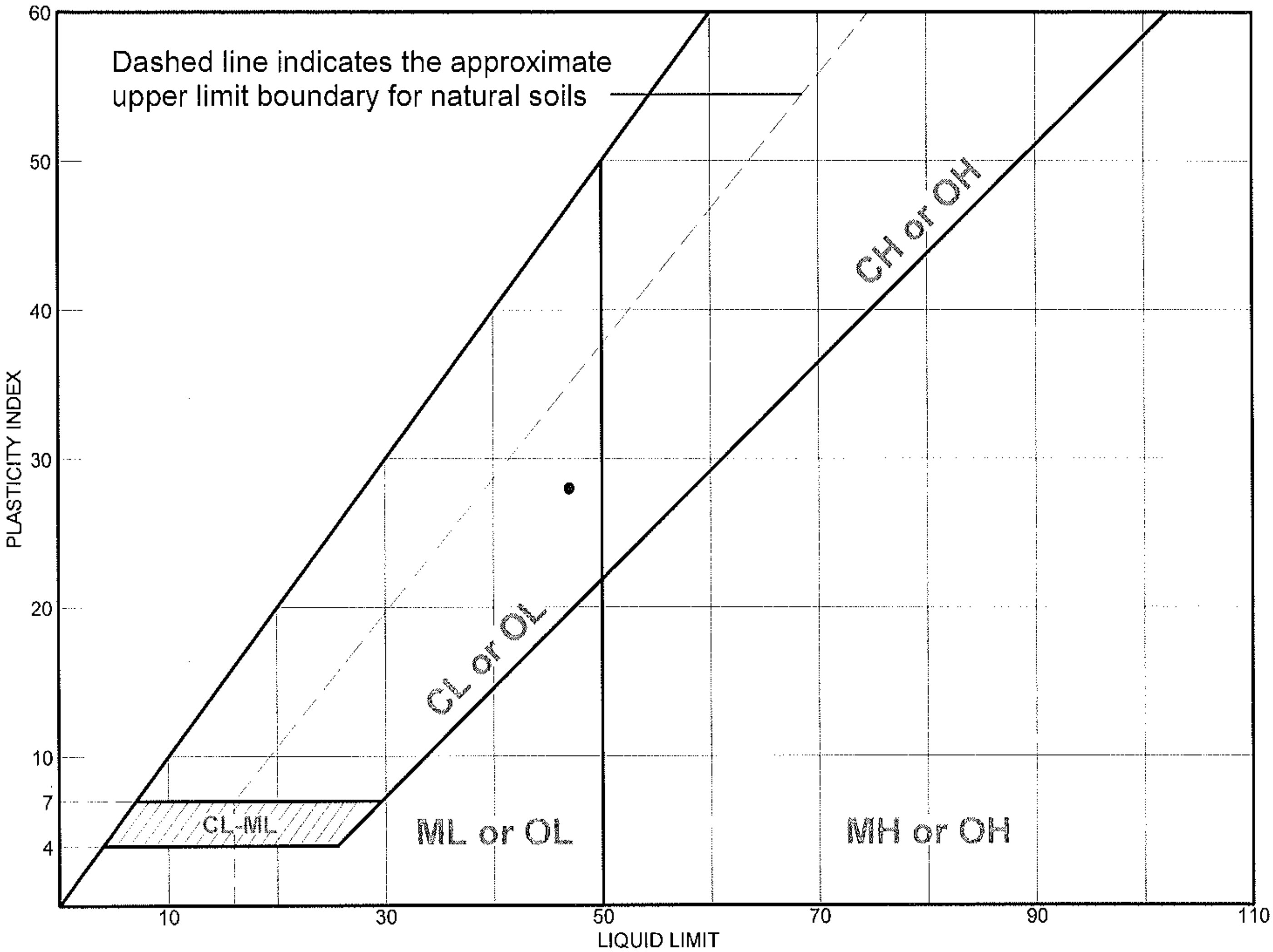
●

Moore Twining Associates, Inc.

Fresno, CA

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		47	19	28			

Project No. E83701.01 **Client:**

Project: San Juan School ol

● **Source:** San Juan School **Sample No.:** B-1 **Elev./Depth:** 20-21.5'

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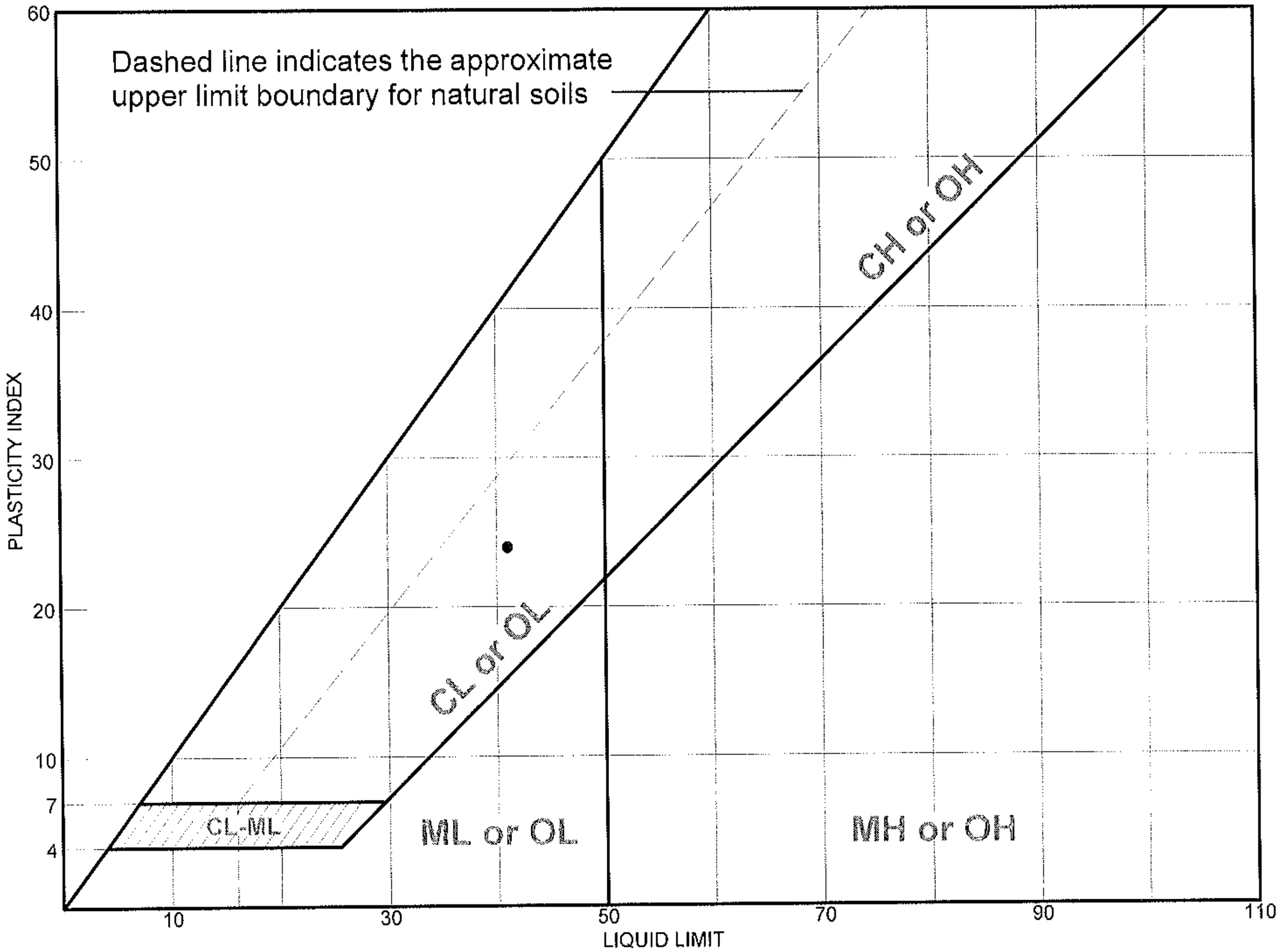
Remarks:

●

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey sand	41	17	24	76.3	48.1	SC

Project No. E83701.01 **Client:**

Project: San Juan School

● **Source:** San Juan School **Sample No.:** HA-2 **Elev./Depth:** 2-2.5'

Remarks:

●

Moore Twining Associates, Inc.

Fresno, CA

Figure

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ASSOCIATES, INC.

Since 1898

EXPANSION INDEX TEST, ASTM D4829

MTA PROJECT NAME:	San Juan School	REPORT DATE:	12/10/2012
		TEST DATE:	12/6/2012
MTA PROJECT NO.:	E83701.01		
SAMPLE I.D.:	B-1 @ 0.5-2'		
SAMPLED BY:	AR		
SAMPLE DATE:	11/21/2012	TESTED BY:	TD

MATERIALS DESCRIPTION: Lean Clay

% PASSING # 4 SIEVE: 100

Initial Moisture Determination:		Final Moisture Determination:	
Pan + Wet Soil Wt., gm	250.0	Wet Soil Wt., lbs	0.9044
Pan + Dry Soil Wt., gm	221.6	Dry Soil Wt., lbs	0.7229
Pan Wt., gm	0.0		
Initial % Moisture Content	12.8	Final % Moisture Content	25.1

Initial Expansion Data:		**Final Expansion Data:**	
Ring + Sample Wt., lbs	0.8156	Ring + Sample Wt., lbs	0.9044
Ring Wt., lbs	0.0000	Ring Wt., lbs	0.0000
Remolded Wt., lbs	0.8156	Remolded Wt., lbs	0.9044
Remolded Wet Density, pcf	112.2	Remolded Wet Density, pcf	116.1
Remolded Dry Density, pcf	99.4	Remolded Dry Density, pcf	92.8

Expansion Data:		Initial Volume	Final Volume
		0.00727222	0.007793
Initial Gage Reading, in:	0.0500		
Final Gage Reading, in:	0.1216		
Expansion, in:	0.0716		
Expansion Index	72	**Comments:**	**(Medium Expansion Potential)**

Classification of Expansive Soils. (Table No.1 From ASTM D4829)

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

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FX: 559.268.7126
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Fresno, CA 93721

MOORE TWINING ASSOCIATES, INC.

EXPANSION INDEX TEST, ASTM D4829

MTA PROJECT NAME: San Juan School
REPORT DATE: 12/10/2012
TEST DATE: 12/6/2012
MTA PROJECT NO.: E83701.01
SAMPLE I.D.: HA-2 @ 2-2.5'
SAMPLED BY: AR
SAMPLE DATE: 11/21/2012
TESTED BY: TD

MATERIALS DESCRIPTION: Clayey Sand

% PASSING # 4 SIEVE: 100

Initial Moisture Determination:		Final Moisture Determination:	
Pan + Wet Soil Wt., gm	250.0	Wet Soil Wt., lbs	0.9359
Pan + Dry Soil Wt., gm	225.2	Dry Soil Wt., lbs	0.7682
Pan Wt., gm	0.0		
Initial % Moisture Content	11.0	Final % Moisture Content	21.8

Initial Expansion Data:		**Final Expansion Data:**	
Ring + Sample Wt., lbs	0.8528	Ring + Sample Wt., lbs	0.9359
Ring Wt., lbs	0.0000	Ring Wt., lbs	0.0000
Remolded Wt., lbs	0.8528	Remolded Wt., lbs	0.9359
Remolded Wet Density, pcf	117.3	Remolded Wet Density, pcf	123.6
Remolded Dry Density, pcf	105.6	Remolded Dry Density, pcf	101.5

Expansion Data:

Initial Volume	Final Volume
0.00727222	0.007571

Initial Gage Reading, in:	0.0500
Final Gage Reading, in:	0.0911
Expansion, in:	0.0411
Expansion Index	41

Comments: **(Low Expansion Potential)**

Classification of Expansive Soils. (Table No.1 From ASTM D4829)

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

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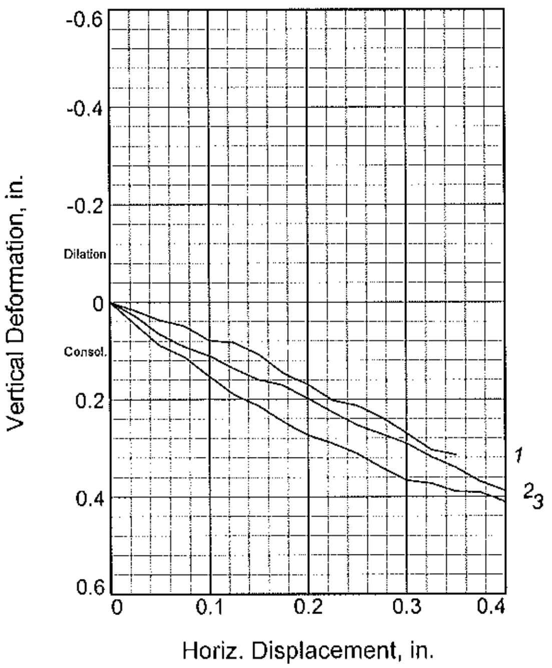

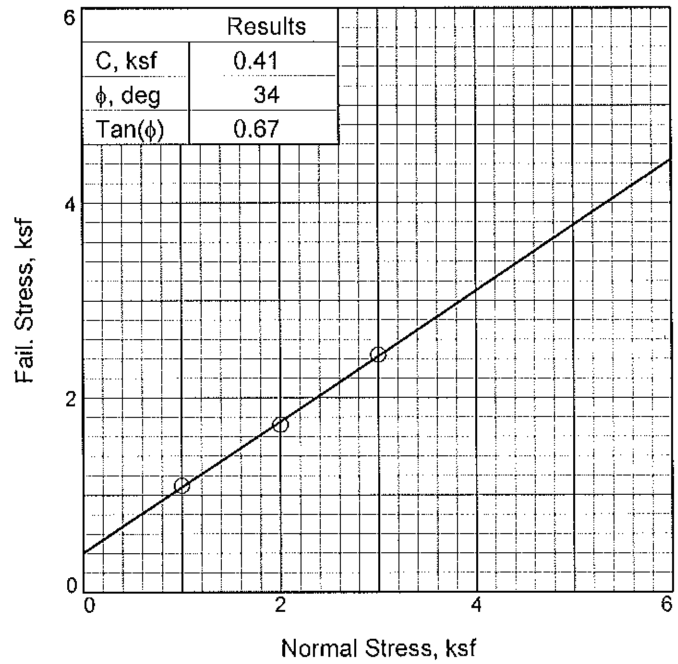

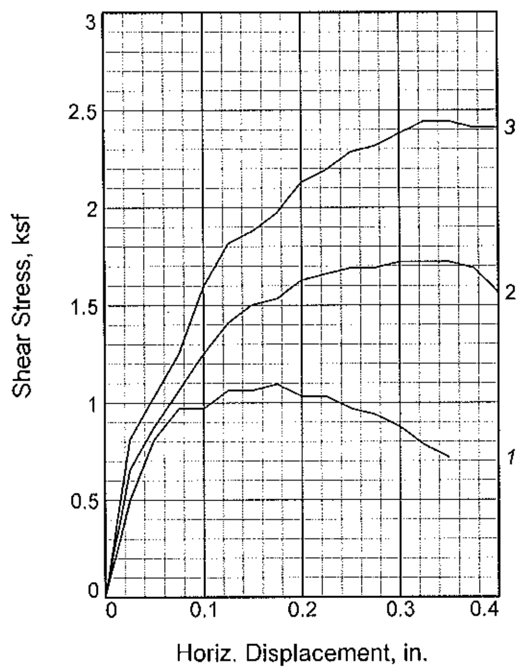

	Sample No.	1	2	3
Initial	Water Content, %	16.0	15.3	14.9
	Dry Density, pcf	105.2	107.8	102.0
	Saturation, %	74.0	75.7	63.3
	Void Ratio	0.5728	0.5353	0.6226
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	26.3	26.4	24.0
	Dry Density, pcf	107.8	111.3	106.3
	Saturation, %	130.4	143.7	114.1
	Void Ratio	0.5345	0.4865	0.5566
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.97	0.96
	Normal Stress, ksf	1.00	2.00	3.00
	Fail. Stress, ksf	1.10	1.72	2.44
	Displacement, in.	0.17	0.30	0.33
	Ult. Stress, ksf			
	Displacement, in.			
	Strain at peak, %	7.2	12.4	13.4

Sample Type:
Description:

Assumed Specific Gravity= 2.65
Remarks:

Figure ________

Client:

Project: San Juan School

Source of Sample: San Juan School **Depth:** 5-6.5'
Sample Number: B-2
Proj. No.: E83701.01 **Date Sampled:** 11/21/12

DIRECT SHEAR TEST REPORT

Moore Twining Associates, Inc.

MOORE TWINING
ASSOCIATES, INC.

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate# 1371

December 03, 2012

Work Order #: 2K26053

Ken Clark
MTA Geotechnical Division
2527 Fresno Street
Fresno, CA 93721

RE: San Juan School

Enclosed are the analytical results for samples received by our laboratory on 11/26/12 . For your reference, these analyses have been assigned laboratory work order number 2K26053.

All analyses have been performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety. Moore Twining Associates, Inc. (MTA) is not responsible for use of less than complete reports. Results apply only to samples analyzed.

If you have any questions, please feel free to contact us at the number listed above.

Sincerely,

Moore Twining Associates, Inc.

Lisa Montijo

Lisa Montijo
Client Services Assistant

MOORE TWINING
ASSOCIATES, INC.

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Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate# 1371

MTA Geotechnical Division
2527 Fresno Street
Fresno CA, 93721

Project: San Juan School
Project Number: E83701.01
Project Manager: Ken Clark

Reported:
12/03/2012

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B1@1-2	2K26053-01	Soil	11/21/12 21:00	11/26/12 16:10
HA1@2.5-3	2K26053-02	Soil	11/21/12 00:00	11/26/12 16:10

MOORE TWINING
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(559) 268-0740 Fax

California ELAP Certificate# 1371

MTA Geotechnical Division
2527 Fresno Street
Fresno CA, 93721

Project: San Juan School
Project Number: E83701.01
Project Manager: Ken Clark

Reported:
12/03/2012

B1@1-2
2K26053-01 (Soil)

Analyte	Result	Reporting Limit	Units	Batch	Prepared	Analyzed	Method	Qualifier
Inorganics								
Chloride	ND	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D-4327-84	
Chloride	ND	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
Sulfate as SO4	**0.0029**	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
pH	**8.4**	0.30	pH Units	T2K2621	11/26/12	11/28/12	ASTM D4972-89 Mod	
Resistivity	**5000**		ohms-cm	T2K2621	11/26/12	11/28/12	ASTM D1125-82	
Sulfate as SO4	**29**	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D4327-84	

MOORE TWINING
ASSOCIATES, INC.

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Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate# 1371

MTA Geotechnical Division
2527 Fresno Street
Fresno CA, 93721

Project: San Juan School
Project Number: E83701.01
Project Manager: Ken Clark

Reported:
12/03/2012

HA1@2.5-3
2K26053-02 (Soil)

Analyte	Result	Reporting Limit	Units	Batch	Prepared	Analyzed	Method	Qualifier
Inorganics								
Chloride	ND	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D-4327-84	
Chloride	ND	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
Sulfate as SO4	**0.00073**	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
pH	**8.3**	0.30	pH Units	T2K2621	11/26/12	11/28/12	ASTM D4972-89 Mod	
Resistivity	**6100**		ohms-cm	T2K2621	11/26/12	11/28/12	ASTM D1125-82	
Sulfate as SO4	**7.3**	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D4327-84	

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
RPD	Relative Percent Difference

Moore Twining Associates, Inc.
Juliane Adams, Director of Analytical Chemistry

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

APPENDIX D

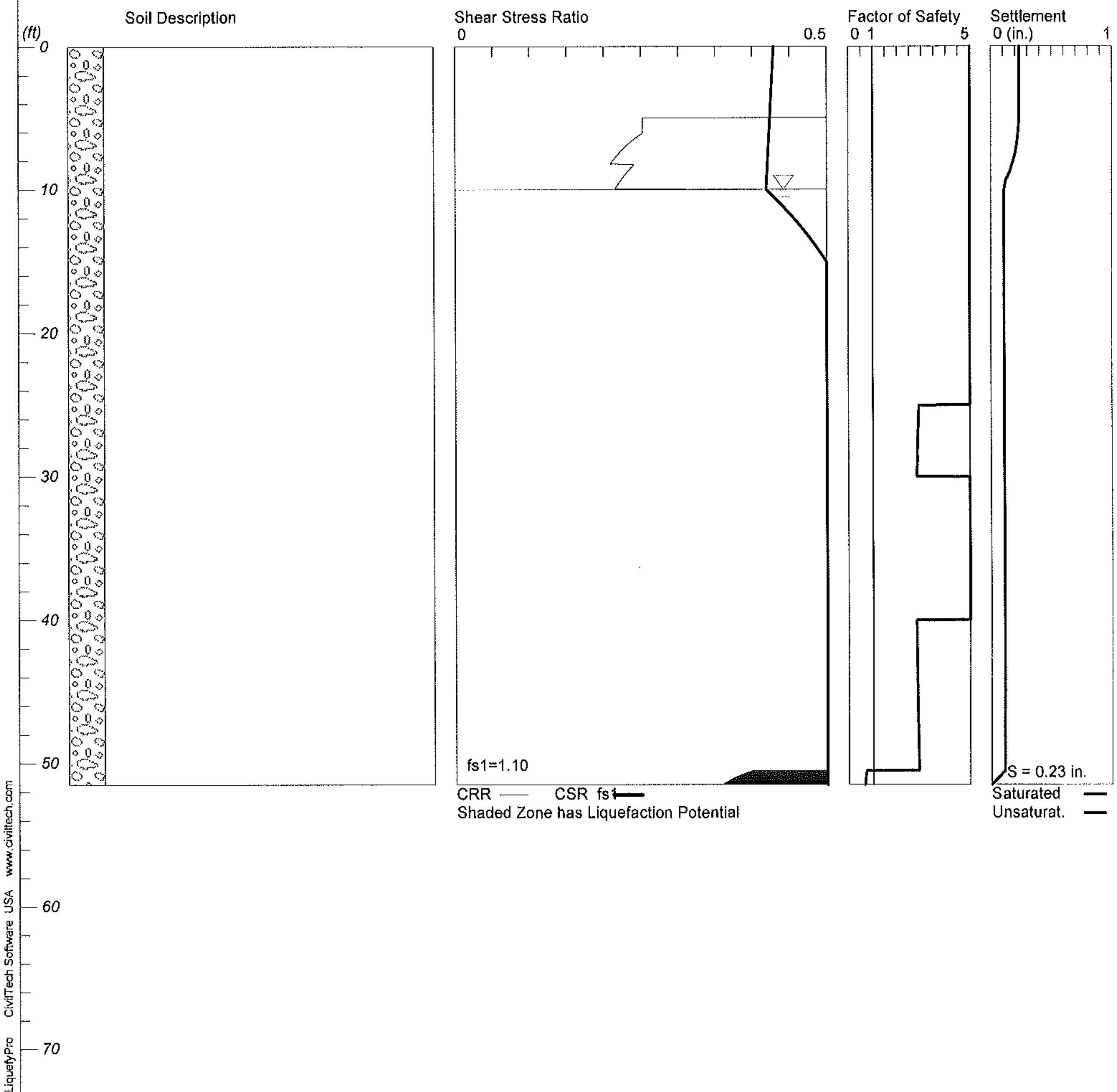
RESULTS OF LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSES

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=B-1 Water Depth=10 ft Surface Elev.=0

Magnitude=8
Acceleration=0.60g



****
LIQUEFACTION ANALYSIS SUMMARY

****
Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 12/26/2012 12:31:56 PM

Input File Name: F:\ENG\Geotech\E83701.01 San Juan School\Liquefy B-1.liq
Title: San Juan School
Subtitle: B-1

Surface Elev.=0
Hole No.=B-1
Depth of Hole= 51.50 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 25.00 ft
Max. Acceleration= 0.6 g
Earthquake Magnitude= 8.00

Input Data:
Surface Elev.=0
Hole No.=B-1
Depth of Hole=51.50 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 25.00 ft
Max. Acceleration=0.6 g
Earthquake Magnitude=8.00
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1.1
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: No

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	6.00	120.00	NoLiq
5.00	14.00	125.00	15.00
10.00	4.00	120.00	NoLiq
25.00	26.00	125.00	35.00
30.00	5.00	120.00	NoLiq
40.00	63.00	125.00	15.00
42.00	47.00	125.00	15.00
45.00	56.00	125.00	15.00
47.00	31.00	124.00	15.00
51.50	31.00	124.00	15.00

Output Results:

Settlement of Saturated Sands=0.11 in.
Settlement of Unsaturated Sands=0.12 in.
Total Settlement of Saturated and Unsaturated Sands=0.23 in.
Differential Settlement=0.117 to 0.154 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.43	5.00	0.11	0.12	0.23
1.00	2.00	0.43	5.00	0.11	0.12	0.23
2.00	2.00	0.43	5.00	0.11	0.12	0.23
3.00	2.00	0.43	5.00	0.11	0.12	0.23
4.00	2.00	0.42	5.00	0.11	0.12	0.23
5.00	0.25	0.42	5.00	0.11	0.12	0.23
6.00	0.25	0.42	5.00	0.11	0.11	0.22
7.00	0.23	0.42	5.00	0.11	0.10	0.21
8.00	0.21	0.42	5.00	0.11	0.07	0.18
9.00	0.23	0.42	5.00	0.11	0.03	0.14
10.00	2.00	0.42	5.00	0.11	0.00	0.11
11.00	2.00	0.44	5.00	0.11	0.00	0.11
12.00	2.00	0.46	5.00	0.11	0.00	0.11
13.00	2.00	0.47	5.00	0.11	0.00	0.11
14.00	2.00	0.49	5.00	0.11	0.00	0.11
15.00	2.00	0.50	5.00	0.11	0.00	0.11
16.00	2.00	0.51	5.00	0.11	0.00	0.11
17.00	2.00	0.52	5.00	0.11	0.00	0.11

18.00	2.00	0.53	5.00	0.11	0.00	0.11
19.00	2.00	0.54	5.00	0.11	0.00	0.11
20.00	2.00	0.55	5.00	0.11	0.00	0.11
21.00	2.00	0.56	5.00	0.11	0.00	0.11
22.00	2.00	0.57	5.00	0.11	0.00	0.11
23.00	2.00	0.57	5.00	0.11	0.00	0.11
24.00	2.00	0.58	5.00	0.11	0.00	0.11
25.00	2.00	0.59	5.00	0.11	0.00	0.11
26.00	1.69	0.59	2.87	0.11	0.00	0.11
27.00	1.69	0.59	2.85	0.11	0.00	0.11
28.00	1.69	0.60	2.83	0.11	0.00	0.11
29.00	1.70	0.60	2.83	0.11	0.00	0.11
30.00	1.70	0.61	2.80	0.11	0.00	0.11
31.00	2.00	0.61	5.00	0.11	0.00	0.11
32.00	2.00	0.61	5.00	0.11	0.00	0.11
33.00	2.00	0.60	5.00	0.11	0.00	0.11
34.00	2.00	0.60	5.00	0.11	0.00	0.11
35.00	2.00	0.60	5.00	0.11	0.00	0.11
36.00	2.00	0.60	5.00	0.11	0.00	0.11
37.00	2.00	0.60	5.00	0.11	0.00	0.11
38.00	2.00	0.60	5.00	0.11	0.00	0.11
39.00	2.00	0.60	5.00	0.11	0.00	0.11
40.00	2.00	0.59	5.00	0.11	0.00	0.11
41.00	1.65	0.59	2.79	0.11	0.00	0.11
42.00	1.64	0.59	2.80	0.11	0.00	0.11
43.00	1.64	0.58	2.81	0.11	0.00	0.11
44.00	1.63	0.58	2.81	0.11	0.00	0.11
45.00	1.63	0.58	2.82	0.11	0.00	0.11
46.00	1.62	0.57	2.83	0.11	0.00	0.11
47.00	1.62	0.57	2.84	0.11	0.00	0.11
48.00	1.61	0.57	2.86	0.11	0.00	0.11
49.00	1.61	0.56	2.87	0.11	0.00	0.11
50.00	1.61	0.56	2.88	0.11	0.00	0.11
51.00	0.38	0.55	0.68*	0.06	0.00	0.06

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request

factor of safety)

F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

APPENDIX E

SURFACE-FAULT RUPTURE HAZARD INVESTIGATION

Surface-Fault Rupture Hazard Investigation

San Juan School Site

San Juan Bautista, California

Final Report

Prepared for:

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December 13, 2012

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1.0 INTRODUCTION

Fugro Consultants, Inc. (FCL) conducted a surface-fault rupture hazard investigation at San Juan School (site), which is located at 100 Nyland Drive in San Juan Bautista, San Benito County, California. The Aromas-San Juan Unified School District is planning seismic upgrades to six existing buildings at the site and construction of a new multi-use building in the existing play court area (Figure 1). The site is located in a state-designated Fault Rupture Hazard Zone (Bryant and Hart, 2007); some existing buildings lay as close as 150 feet to the mapped trace of the San Andreas fault zone. Because of the proximity of the site to the fault, the proposed site improvements are subject to the California Administrative Code CCR Title 1 Part 1, which states that no new school buildings shall be constructed, rehabilitated or relocated within 50 feet of the trace of an active fault. A fault is considered active if there is evidence of fault-related deformation (e.g., discrete offset, fracturing, and/or folding) younger than ~11,000 years old (Bryant and Hart, 2007; California Geological Survey, 2002). The purpose of this investigation was to assess the presence or absence of active faulting beneath the site in order to determine the potential hazard posed by future surface-fault rupture associated with the San Andreas fault.

1.1 Scope of Work

The scope of work is outlined in Moore Twining Associates, Inc. contract with FCL dated October 26, 2012, and included the following tasks:

- Review of the site geomorphology and geology using readily available stereo aerial photographs, digital elevation maps, geologic maps, and published and unpublished technical data
- Review of a project work plan prepared by Moore Twining.
- Documentation and analysis of two exploratory trenches
- Soil profile analyses of trench exposures
- Trench review with the California Geological Survey (CGS)
- Preparation and review of this draft Fault-Rupture Hazard Investigation report, to be included as an appendix in Moore Twining Associates, Inc.'s geotechnical and geologic/seismic hazard investigation report.

Trench logging was conducted by FCL and Moore Twining Associates, Inc. on November 06 through November 08, 2012 and November 12, 2012, of two exploratory trenches totaling approximately 477 feet in length. A second field visit was conducted on 13 November 2012, which included soil profile analyses, and a field review of the trench exposures with representatives of the CGS.

1.2 Approach

The subsurface investigation and this report follow guidance provided by the CGS Note 48 "Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings (dated January 01, 2011)", and Note 49, "Guidelines for Evaluating the Hazard of Surface Fault Rupture", which recommend methodologies for assessing seismic hazards in California. In accordance with these documents, exploratory trenching was used to evaluate the presence or absence of active faults beneath the site. The decision to use trenching as an investigative technique and the choice of trench layout were both based on the success and locations of previous trenching efforts adjacent to the San Juan School campus (Cleary Consultants, 1987; D&M Consulting Engineers, Inc, 2002).

Our trench investigation extended to a maximum depth of approximately ten feet below adjacent ground surface. Age determination of the deposits exposed in the trenches was based on the soil profile development on sediments exposed in the trench walls.

1.3 Report Organization

Following this introduction, Section 2.0 presents results from FCL's review of the geomorphology and geology of the site. Data reviewed for this task included stereo air photos, LiDAR-based digital elevation data, geologic maps, and previous consultant's reports from studies done adjacent to the school campus. Section 3.0 presents the results of the trenching investigation, with particular attention given to the geologic relations that argue in favor of the absence of faulting, as well as soil profile analysis and estimates on the age of the geologic units exposed in the trenches. Section 4.0 provides a discussion on the implications of Sections 2.0 and 3.0 with respect to the presence or absence of faulting across the site. Section 5.0 provides a reference list of sources cited in this report.

1.4 Project Team and Acknowledgements

The field investigations summarized in this report were completed in November 2012, by FCL geologists Joshua Goodman (PG) and Dr. Janet Sowers (PG). Moore Twining Associates, Inc. geologists and engineers involved in the field investigation included Mr. Kenneth Clark (CEG), Allen Harker (PG) and Amer Razaq. Dr. Janet Sowers examined soil profile development in both trenches. FCL geologists Bill Godwin (CEG) and Dr. Ozgur Kozaci provided technical review of this report. Graphics were done by Carolyn Mosher.

FCL appreciates insightful discussions and review of field data with Ron Rubin and Jennifer Thornburg of the California Geological Survey.

1.5 Limitations

The conclusions and recommendations contained in this report are professional opinions derived in accordance with current standards of professional practice. This report has been prepared for the exclusive use by Moore Twining Associates, Inc. and applies only to the San Juan School site. In the event that there are new or different geologic evidence or assumptions that affect the proposed project, the conclusions and recommendations contained in this report should not be considered valid unless the relevant new data are reviewed by a FCL geologist. This report presents the results of a fault rupture hazard evaluation and is not a geotechnical assessment of site conditions for the proposed development. Geotechnical engineering assessment and recommendations are included in Moore Twining's geotechnical engineering and geologic/seismic hazard investigation report.

Reliance on this report by others for other projects at this site, or projects at other sites, must be done at their risk unless consulted by FCL and Moore Twining.

2.0 AERIAL PHOTO INTERPRETATION AND DATA REVIEW

FCL reviewed stereo air photos, LiDAR digital elevation data and online aerial imagery to evaluate the geomorphic and tectonic geomorphic setting of the site for potential surface faulting and/or ground deformation, as well as reports of previous investigations within and adjacent to the San Juan School site. Aerial imagery was reviewed by FCL on November 01, 2012, at the Oakland office of Aerial Science, and consisted of post-1979 imagery at various scales (Table 1). LiDAR digital elevation data covering the site vicinity had a resolution of one-half-meter and was collected by the Northern California Fault System LiDAR Survey on March 21 through April 17, 2007. Derivative hillshade, slope, and contour maps were generated from these data to highlight fault-related lineaments. These maps were compiled in ArcGIS along with digital Quaternary fault maps (Jennings, 1994; CGS 1974), regional geologic maps (Figure 2) (Wagner et al., 2002), and raster images of 7-1/2 minute topographic maps (U.S. Geological Survey, 19XX).

TABLE 1: STEREO AIR PHOTOS REVIEWED FOR THIS STUDY

Stereo Pair Imagery	Date	Scale	Source
AV-1700-17-52 and AV-1700-17-53	05-14-79	1:54,000	Aerial Science
AV-3411-7-7 and AV-3411-7-8	11-05-88	1:36,000	Aerial Science
SBN-AV-5200-45-27 and SBN-AV-5200-45-28	11-07-96	1:12,000	Aerial Science

2.1 Geomorphic and Tectonic Geomorphic Evaluation

The site lies at the toe of a low-relief, northeast-sloping Quaternary alluvial fan located along the western margin of San Juan Valley (Figures 2 and 3). Fan material at the site consists of interbedded sands, silts, clayey sands and silts, and sandy gravels, discussed in detail in Section 3.0. Based on the granitic composition of gravel clasts exposed in the trench (discussed in Section 3.0), the fan sediments were sourced from the adjacent San Juan Creek drainage, which together with the next smaller drainage basin to the northwest, bounds a reentrant in the western margin of San Juan Valley (Figure 2) The site itself is located approximately 1,300 feet northeast of the range front. A geotechnical boring drilled on the south corner of the San Juan School campus (D&M Consultants, Inc., 2002) encountered fine- to coarse-grained clayey and sandy sediments to the depth of boring termination at 41 feet, indicating a minimum thickness for the fan sediments. The fan surface that underlies the site is inset into a northwest-trending fault-parallel ridge (Figure 3). Regional geologic mapping of the San Juan Valley (Wagner et al., 2002) indicates the ridge is also underlain by Quaternary alluvium.

Approximately 150 feet beyond the northeast edge of the site, the alluvial fan is truncated by a prominent linear escarpment, the base of which coincides with the mapped trace of the San Andreas fault (Figure 2). The escarpment trends northwest and can be traced for 1.7 kilometers. Beyond the ends of the escarpment the fault lacks obvious geomorphic expression until it enters the adjacent ranges. There it is defined by linear drainages incised into Mesozoic and Paleozoic bedrock (Figure 2) (Wagner et al., 2002).

On the school site, tectonic geomorphic indicators of active faulting such as tonal and/or vegetation lineaments, side-hill benches, topographic escarpments, ponded alluvium, anomalous drainage patterns, and offset or deflected channels (e.g., McCalpin, 1996), were not identified. We note, however, that the available historical aerial photographs and LiDAR data reviewed in this study are dated after the establishment of the town of San Juan Bautista. Buildings and roads may have obscured any original subtle fault-related features. Thus, the imagery has limited usefulness for evaluating the predevelopment landscape and possible fault-related lineaments. Geomorphic indicators of active faulting noted off-site, such as the prominent linear escarpment associated with the main trace of the fault, did not reveal trends suggestive of faulting on the site

The fault-parallel ridge that extends northwest of the site is 100 meters wide and extends for 1.2 kilometers (Figure 3). The gap in the ridge where the school is located is interpreted to be an erosional gap created by San Juan Creek. Trench A lies on slightly higher ground to the south of the gap, presumably the continuation of the ridge. Because of its parallelism, narrowness, and close proximity to the fault, the ridge is suggestive of a pressure ridge. Pressure ridges, or flower structures (e.g., Harding, 1983; Sylvester, 1988), are relatively narrow uplifted blocks that are bound on both sides by faults with converging dips—usually a strike-slip fault coupled with a reverse or oblique-slip fault. These types of features are common in transpressional settings, where translational motion is non-parallel to the master strike-slip fault(s). The presence of a pressure ridge adjacent to the fault at this latitude is consistent with the local trend of the San Andreas fault, which strikes approximately 15° counterclockwise relative to the regional trend of the fault system southeast of San Juan Bautista (i.e., the fault is in a restraining geometry). If the pressure ridge interpretation is correct, the site would be located in the hanging wall of (above) a southwest-vergent reverse fault that forms a splay off the San Andreas fault. Because no evidence of surface faulting was identified in the data reviewed or collected for this study, the antithetic fault may be present only at depth, causing gentle tilting and folding of surficial sediments over the tip of the blind fault (See. Section 4 for discussion of tilted beds exposed in Trench A.)

2.2 Previous Studies

Two previous fault investigation studies were conducted adjacent to the San Juan School site. In 1987, Cleary Consultants performed a fault location investigation for planned San Juan Junior High School additions. The work involved the excavation and logging of two trenches totaling 770 feet in length. In 2002, D&M Consulting Engineers conducted a geologic, seismic, and fault hazards assessment for a proposed addition to the kindergarten building at San Juan Elementary School. This study involved the excavation and logging of a single trench 192 feet long within the property east of San Juan School.

Neither investigation found evidence of fault displacement in the trench exposures, however, one trench showed evidence of possible folding. Trench ET-1 of the Cleary investigation was located along the northwestern perimeter of the school property, extending 620 feet northeast from The Alameda to the property boundary adjacent to the San Andreas fault (Figure 1). Most of the trench encountered flat lying fluvial sands, silts, and granitic gravels with some channeling and interfingering of beds. However, at the northern end where the trench passed through the margin of the fault-parallel ridge (Figure 3), the flat-lying sediments appear to onlap older fluvial sediments that arch upward and then downward toward the fault, forming a gentle anticline. No evidence of fault rupture was observed, however, the arching of the older beds suggests some folding may have taken place adjacent to the fault. This folding suggests a tectonic origin for the fault-parallel ridge where the Mission and other historical buildings are sited, consistent with a pressure ridge model. Trench ET-2 was excavated close to the fault in the low flat area beside the school, north of Trench B of the present study (Figure 1). This trench encountered flat-lying fluvial sands, silts, and gravels with no evidence of fault rupture, displacement, or folding.

The D&M trench was located east of the school on the private property near the location where Trench A of the present study was excavated. This trench extended 192 feet and exposed 7 to

10 feet of fluvial sands, silts, and granitic gravels. No evidence of fault rupture or other deformation was observed. D&M estimated a late Pleistocene age for the deposits based on assessment of soil profile development. Subsurface conditions were further explored by drilling a 41.5-foot borehole in the southeast corner of the school property. This borehole encountered beds of sandy clay, silty sand, and gravelly clayey sand to the bottom of the hole, indicating that the alluvium is at least 41 feet thick at this location. Groundwater was encountered at a depth of 28 feet on the day the boring was drilled in October 2002.

3.0 SUBSURFACE TRENCH INVESTIGATION

Two exploratory trenches were excavated to characterize the near-surface stratigraphy and structure of the site. It is understood that Moore Twining Associates provided a copy of the project work plan to CGS, discussed the proposed trench locations with CGS, and that CGS's only suggestion was to extend Trench B about 50 feet further to the southwest. Moore Twining has indicated that the actual locations of the trenches excavated are consistent with the proposed trench locations, plus the extension of Trench B to the southwest. When combined with a previously excavated trench on the property east of the school campus (D&M Consulting Engineers, Inc., 2002), the location and orientation of these two new trenches provide a “screen” to intercept any potential vertical, northwest-striking faults that are sub-parallel to or splay from the mapped trace of the San Andreas fault, with respect to the six (6) existing buildings to be upgraded and the proposed multi-use building. FCL’s involvement in the field component of the trenching investigation was limited to logging and analyzing the geologic relationships exposed in the trench walls and conducting soil profile analyses (Plates 1 and 2). Excavation, shoring, cleaning, and establishing level-lines in the trenches were overseen by Moore Twining Associates, Inc.

3.1 Trench Exploration Program

Two exploratory trenches (Trench A and Trench B) were excavated to evaluate the presence or absence of active surface faulting within the site envelope. Figure 1 is a plot plan showing the locations of the two trenches in relation to school buildings and the mapped trace of the fault. Trench A was excavated in an undeveloped field on the adjacent property. The trench extended for approximately 200 ft along an azimuth of 015°/195°. The northeast end of Trench A extended just beyond the crest of the linear escarpment described in Section 2.1. Trench B was excavated on the edge of a grassy playing field next to the asphalt basketball court on the school campus. The trench extended for approximately 277 ft along an azimuth of 045°/270°.

All trenches were excavated with a rubber-tire backhoe with a 36-inch bucket. The trench was stabilized with aluminum hydraulic speed shores spaced at 4 to 5-ft intervals (not shown on the trench logs on Plates 1 and 2). The southeastern wall of each trench was cleaned in its entirety to remove backhoe smear and provide a fresh exposure. Stratigraphic contacts were marked with nails and colored flagging tape. Distinct marker beds (e.g., thin layers of clay or laminar silt and clay beds) were used as strain markers across the length of the trenches to evaluate the presence or absence of fault or fold deformation (e.g., McCalpin, 1996). Level lines strung along the lengths of the trenches provided a survey datum for trench logging. Trench A was logged at a scale of 1 inch equals 3 feet (1:36) and Trench B was logged at a scale of 1 inch equals 2.5 feet (1:30). Both trench logs are presented at a uniform scale of 1 inch equals 5 feet on Plates 1 and 2. Stratigraphic units and horizons were described using the Unified Soil Classification System (USCS) with additional observations noted using standard geologic and soil nomenclature (e.g., Birkeland, 1999).

Age determination of the deposits was based on soil profile development and weathering, and is discussed in Section 3.3.

3.2 Trench Stratigraphy

The stratigraphy exposed in the trenches consisted of alluvial fan deposits of sand, silt, clay, and gravel. The dominant sedimentary structures observed in both trenches include channels, cross beds, laminations, graded beds, and massive beds. Due to the preponderance of channeling, many of the units were laterally discontinuous, and characterized by abrupt-to-sharp and wavy basal contacts. The most laterally continuous unit was a gray to dark reddish brown fat clay bed, which was traced along the base of Trench B for over 100 feet (Station 1+70 to 2+77).

Finer-grained deposits in both trenches were damp to moist, and soft. The sandy gravels were damp to dry, and dense.

3.2.1 Trench A

Five stratigraphic units were recognized in Trench A, and are described in order from oldest to youngest. Detailed descriptions of the units and subunits are provided on Plate 1. Unit 1 is a fine-grained sequence of well-stratified and laminated sands, dipping 5° to 8° to the southwest (subunits 1A through 1D). Unit 2 consists of locally cross-bedded and interfingering sand and gravelly sand (southwest), and sandy gravel (northeast), with lithologic contacts that dip gently southeastward approximately parallel to the dipping beds of Unit 1. Unit 3 consists of clast-supported sandy gravels with nested channel deposits and sand lenses, with flat-lying stratification. Unit 4 is a well-graded sand, silt and gravel deposit that dips to the northeast, parallel to topographic slope, and is interpreted to be colluvium derived from the underlying units upslope. Unit 5 is a fine sandy silt deposit that mantles the ground surface and is interpreted to be primarily of eolian origin. Unit 1 is at least 15 feet thick. Unit 2 is approximately 7 feet thick, and the basal contact with Unit 1 is an angular unconformity. Unit 3 is at least 10 feet thick.. Abundant granitic clasts within this unit indicate the sediments were derived from San Juan Creek, the only local stream that drains the Cretaceous granites (Kgr) (Figure 2) . Unit 4 varies in thickness between approximately 5 feet in the northeast to less than 1 foot in the southwest, and it unconformably overlies all of the other three units. Unit 5 is approximately 1 foot thick. The transition from Unit 1 deposits to deposits from Units 2 and 3 may record the migration of the thalweg of San Juan Creek across what was previously an overbank or quiet water environment.

No evidence of faulting was observed in Trench A. All bedding contacts are continuous and unbroken, and there are no portions of the trench exposure that were not traversed by a continuous contact. The lower stratigraphic units, exposed in the northeastern end of the trench, however, appear to be tectonically tilted 5° to 8° to the southwest. See section 4 for discussion.

3.2.2 Trench B

Trench B, similar to Trench A, exposes alluvial fan deposits of sand, silt, clay, and gravel. The lithologic composition of the gravels indicates a granitic source area, again derived from San Juan Creek. All strata are flat-lying, and, similar to Trench A, show no evidence of fault displacement.

Seven main stratigraphic units were identified in Trench B. Units 1, 2 and 3 are beds of silty and clayey sands that exhibit yellow- to reddish-brown mottling and vertical streaking across stratigraphic boundaries, interpreted to be iron staining from weathering and pedogenesis. Unit 5 is a sandy gravel that fills a channel eroded into Unit 3 between Station 25 to 55, and overlies intact strata of Unit 3 as far as Station 150. Where the base of the Unit 5 gravels is traced to the southwest in Trench B, it interfingers with the underlying fine-grained sequence, demonstrating that the two are conformable and time-transgressive. Further, the base of the gravels in Trench B was disrupted in two places (Station 3 and 5 Plate 2) by ~0.5-foot-high diapir-like intrusions of sand from the underlying sequence. These features indicate that the sands were relatively loose and saturated when the gravels were deposited

One of these intrusions, located at the base of the beds of massive sandy gravel in the northeast end of Trench B is a bulbous-shaped body of fine sand that rises up and intrudes the gravel deposit (See Trench B log) Although the main body of sand is laminated the sand within the intrusion is massive The sand intrusion is interpreted to be a liquefaction feature, and its primary significance to this study is evidence that the sand was in a liquefiable state (loose unconsolidated, and saturated) at the time the gravel was deposited Thus the sand and gravel beds may be roughly contemporaneous At present both beds are consolidated and dry and exhibit significant weathering. The triggering event for liquefaction could have been the emplacement of the gravel itself in which case the additional load alone could have resulted in consolidation of the sand and upward escape of pore water and liquefied sand. In addition, seismic ground shaking may have triggered the liquefaction event. Similar structures termed "seismites" have been described in the literature and attributed to seismic ground shaking of saturated, unconsolidated, bedded sediments (eg. Moretti and Ronchi 2011)

Units 5 and 6 form the upper part of the trench exposure in Trench B. Unit 5 is a sandy gravel with decomposed granitic gravel clasts exposed in the northwest half of the trench. Unit 5 is onlapped by Unit 6, a massive sand grading upwards to sandy clay exposed in the southeast half of the trench. At the base of the trench beneath Unit 6, a consistent and continuous bed of fat clay, Unit 4, clearly indicates the absence of faulting in this portion of the trench.

Finally, the sediments are capped by dark grayish brown A-horizon that may be partly derived from eolian deposits. In general, above the top of the trench wall, the soil is granular fine sandy silt. Below the top of the trench wall, the A-horizon is characterized by prominent prismatic structure, indicating the presence of clay that forms vertical cracks as it wets and dries. Deeper in the soil profile, pedogenic carbonate in the form of filaments and crack face coatings has accumulated within the sandy clays of Unit 6 southwest of Station 190.

3.3 Soil Profile Analyses

Soil profile development was assessed in both trenches to help constrain the ages of the deposits. In Trench A a single complete profile description was made including identification of soil horizons and description of the properties of each horizon. In Trench B general observations of soil profile development and weathering were made.

Soil Profile Development in Trench A

Soil profile SP-SJS-01 was described on the east wall of Trench A at approximately the 136-foot mark, at the crest of a low grassy rise (Plate 1). The location was chosen as most likely to exhibit maximum thickness of the soil profile on this moderately eroded landform. In addition, the soil is formed in gravelly alluvium at this location as opposed to sandy silts, enabling the description to include an evaluation of gravel weathering.

Major features of this soil include a thick dark-gray, fine sandy silt A horizon of possible eolian origin, overlying a thin Bt horizon of clay accumulation and rubification interpreted to belong to an eroded soil profile developed in Pleistocene alluvial fan deposits. The Bt horizon grades downward into weathered gravelly alluvium in which 60 to 80% of granitic clasts are highly weathered, falling apart with the blow of a hammer.

Pedogenesis

This soil is formed primarily in sandy and gravelly, granitic alluvium that was deposited on the alluvial fan of San Juan Creek, which drains hills underlain by Cretaceous granites (Figure 2). The soil profile is truncated by erosion, and is overlain by a younger deposit of fine sandy silt in which a dark grayish brown A-horizon is developed. This silt is probably of eolian orgin, based on its consistent fine grain size and the uniform mantle it forms over the land surface as exposed in the trench walls (Plate 1). Silt and fine sands from San Benito River alluvium in San Juan Valley are a possible source of the material. The base of the silt deposit is slightly clayey with a weak prismatic structure, and is designated the A/B horizon; it features both organic matter accumulation and minor clay accumulation. Directly beneath the A/B horizon, lies the soil developed in the granitic alluvium. The uppermost horizon of this soil is the zone of maximum accumulation of clay (Bt1 horizon) within the truncated soil profile. Organic matter from the A horizon has darkened this horizon, masking its rubification. Rubification is therefore greatest in the underlying Bt2 horizon, although clay accumulation is somewhat less. Both clay and rubification decrease with depth in the Bt3 horizon. The C-horizon of weathered alluvium underlies the Bt3 horizon and is broken into sub-horizons based on bedding characteristics of the parent alluvium. The C3-horizon at the base of the exposure features color variations in the bedding interpreted to be the result of groundwater fluctuations causing mobilization and precipitation of iron.

With the exception of the upper silt soil and colluvium, the soil in Trench A is judged to be late Pleistocene in age based on two types of evidence, geomorphic and pedogenic. Significant landform evolution has taken place since the alluvial fan deposits exposed in the trench were laid down. This northern portion of the San Juan Creek alluvial fan, where Trench A is sited, sits above the level of the modern alluvial fan and is truncated by the San Andreas fault. Slow episodic vertical uplift on the southwest side of the San Andreas fault has gradually displaced the fan sediments and created a linear scarp face, about 6 meters high near Trench A (Figure 3). Creation of the fault scarp may take thousands of years, depending on the uplift rate. By contrast, the modern alluvial fan, shown by the regularly spaced contours on Figure 3, grades to the San Juan Valley and crosses the fault without offset just north of Trench A.

Second, the scarp face has been significantly modified by erosion. Stratigraphic bedding in the alluvium near the scarp is truncated where erosion has rounded the scarp face (north end of Trench A, Plate 1). Gentle rounding of the scarp face may also take thousands of years (Hanks, 2000).

Pedogenic characteristics of the soil are consistent with a late Pleistocene age (11,000 to 100,000 years). The extreme weathering of the granitic clasts, the accumulation of clay, and degree of rubification are consistent with a late Pleistocene age.

TABLE 2. SOIL PROFILE DESCRIPTION (See Plate 1) Trench A – Station 136

Horizon	Depth	Description
A	0-46 cm	Dark grayish brown (10YR 4/2, dry) fine sandy silt loam with many pores, slightly hard to hard, non-sticky, non-plastic, weak granular structure, no visible clay films.
A/B	46-62 cm	Brown (10 YR 4/3, 4/4, dry) slightly clayey silt loam, moderate coarse prismatic structure breaking to moderate fine angular blocky structure, less than 10% fine to coarse subangular gravel, hard, slightly sticky, slightly plastic, no visible clay films, clear wavy boundary.
Bt1	62-88 cm	Dark yellowish brown (10YR 4/4, dry) sandy clay loam, weak angular blocky structure, 50 percent fine to coarse, angular to subrounded gravel, hard, sticky, slightly plastic to plastic, few faint to distinct clay films, gradual wavy boundary. Granitic clasts are highly weathered. Maximum clay occurs in this horizon.
Bt2	88-128 cm	Brown to yellowish brown (7.5YR 5/4 to 10YR 5/6, dry) loamy sand, 50 percent fine to coarse angular to subrounded gravel, weak angular blocky structure, slightly hard, non-sticky, non-plastic, few faint to distinct clay films. Granitic clasts are highly weathered. Maximum rubification occurs in this horizon.
Bt3	128-187 cm	Yellowish brown (10YR 5/4, dry) loamy sand, 50 percent fine to coarse, angular to subrounded gravel, soft, few faint to distinct clay films, clear wavy boundary at base of massive sandy gravel unit. Granitic clasts are highly weathered.
C1	187-241 cm	Brown (10YR 5.3, dry) loamy sand, ~5-% fine angular to subrounded gravel, soft, very few faint clay films, soft, very few faint clay films, clear wavy boundary. Stratified, sandy, granitic gravel. Granitic clasts are highly weathered.
C2	241-286 cm	Pale brown to light yellowish brown (10YR 6/3 to 6/4, dry) loamy sand, ~50% fine to medium angular to subrounded gravel, single grain, slightly hard, very few faint clay films. Granitic clasts are highly weathered. Stratified, sandy, granitic gravel.
C3	286-330 cm	Yellowish brown to light brownish gray (10YR 5/4 to 6/2, dry) loamy sand, ~50% fine to coarse angular to subrounded gravel, no clay films, color varies with strata reflecting iron accumulation, probably as the result of periodic groundwater saturation. Granitic clasts are highly weathered. Stratified, sandy, granitic gravel.

The soils in Trench B share many features with those in Trench A, and are judged to be of similar age. Granitic clasts in Unit 5 are highly weathered, with 60 to 80 percent of the clasts decomposed. Sandy and silty beds in Units 1 through 3 show reddish iron staining and mottling similar to those in Trench A. The age of Unit 6 is less clear. Based on an onlapping relationship with Unit 5, it may be somewhat younger. The soil developed in Unit 6, with strong prismatic structure and an accumulation of pedogenic carbonate, is similar to some early Holocene soils. However, the basal clay layer beneath Unit 6, Unit 4, which establishes the absence of faulting in this portion of Trench B, contains iron staining typical of the late Pleistocene units.

4.0 DISCUSSION

The trench data from this study provide a basis for interpreting the displacement potential and fault rupture hazard at the site. Based on the available information, FCL judged that the trenches did not expose any strands of the San Andreas fault zone. This conclusion is based on the identification of a series of uninterrupted, horizontally-overlapping stratigraphic horizons and marker beds, which could be traced laterally across each trench (Plates 1 and 2). The lateral continuity of these marker beds precludes the occurrence of fault displacement and associated ground rupture at the site since deposition of the strata. Based on the disaggregated nature and decomposition of the granitic clasts within the conglomerate, and the development of an argillic horizon and rubification in the soil profile, the deposits exposed in the trenches are interpreted as being older than 11,000 years.

At the latitude of the site, the surface trace of the San Andreas fault is well expressed as a linear escarpment in Quaternary alluvium, and is located approximately 100 feet beyond the northeast end of Trench A. The absence of any faulting southwest of the mapped trace of the San Andreas fault is consistent with the results from this study as well as earlier trench studies on the adjacent properties (Cleary Consultants, Inc., 1987; D&M Consulting Engineers, Inc., 2002). Three paleoseismic screening trenches excavated on property adjacent to the school campus prior to this study (Cleary Consultants, Inc., 1987; D&M Consulting Engineers, Inc., 2002) all encountered bedded fluvial sediments with no evidence of fault rupture. Further, two magnetometer surveys were conducted across the western edge of the campus in conjunction with the trenching (Cleary Consultants, Inc., 1987), and the only magnetic intensity anomalies—

proxies for crossing a fault—occurred where the survey line crossed the linear escarpment or passed beneath overhead power lines.

Evidence of tectonic deformation at the site was identified during this study and consisted of back-tilting of beds in the fine-grained sequence exposed in Trench A. Laminations and thin horizons in sand and silt had an apparent dip of 5° to 8° to the southwest (Plate 1). It is unlikely that the beds were deposited with these dips because: (1) the inclination is too steep for fine-grained, laminated sediments, which were most likely deposited near the distal toe of the San Juan Creek alluvial fan; and (2) the southwest dip direction is opposite the local topographic gradient, which is inclined to the northeast. The deformation observed in Trench A, as well as the possible gentle folding in Trench ET-1 (Cleary Consultants, 1987) are consistent with growth of a pressure ridge along the San Andreas fault.

The potential for permanent ground deformation associated with differential tectonic tilting or folding at the San Juan School site during a large earthquake merits discussion. Assuming that the tilting and folding observed in Trench A and Trench ET-1 are tectonic and coseismic, the amount of deformation per seismic event can be estimated by considering the age of the sediments and the frequency of large earthquakes on the San Andreas fault. The sediments are estimated to be late Pleistocene, a minimum of 11,000 years in age. Large earthquakes ($\geq$ 6.8 M) on the San Andreas fault are thought to have occurred every 150-250 years in the late Holocene, based on work in the Watsonville area by Streig et al, 2012). Extrapolating this rate, approximately 55 earthquakes would have occurred over the past 11,000 years. Assuming a cumulative maximum of 8° of tilting over this time period, the amount of tilt per event would be approximately 0.15°, a value unlikely to cause structural distress. This is a conservative estimate of tilting per event, as the age estimate of the tilted sediments is a minimum value. Sediments in Trench B, which show weathering and pedogenesis consistent with a late Pleistocene age, are flat-lying, suggesting that the tilted sediments in Trench A may be significantly older than 11,000 years. Therefore, the potential impact of tectonic tilting on structural distress at the site is considered low, and the potential for permanent ground deformation is also considered low.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the available information, we draw the following conclusions about the surface-fault rupture hazard relative to the proposed improvements at the San Juan School site:

- Two exploratory trenches across the San Juan School site exposed late Pleistocene alluvial and fluvial sediments that accumulated along the southwest margin of the San Juan Valley prior to ~11,000 years. These sediments include several excellent markers with which to evaluate faulting since that time.
- No active faults were documented in the trench exposures and the sediment layers, and continuous marker horizons provide positive evidence for the absence of fault offset. These findings, in conjunction with the findings of the previous investigations (D&M Consulting Engineers, Inc. 2002, and Cleary Consultants, Inc., 1987) indicate that the surface-fault rupture hazard within the proposed improvement area of the San Juan School site is low. All proposed improvements meet the 50-foot setback requirements.
- The site is located on the uplifted southwestern side of the San Andreas fault which shows some evidence for Quaternary tilting and folding. However, based on the small amounts of deformation observed in the trenches and the pre-Holocene age of the deformed sediments, the potential for permanent ground deformation (tilting or folding) is considered to be low.

5.2 Recommendations

Although the trenches show no evidence for tectonic faults, and provide direct evidence for the absence of fault displacement across the site, common practice in AP investigations is to assume that a fault is located directly beyond the limits of trenching, and that a setback from the fault be established wherein buildings cannot be placed. The purposes of the setback are to mitigate the hazards of: (1) secondary faulting adjacent to an active fault and/or (2) uncertainty in the projected location of the active fault across a site. A common setback distance is about 50 feet from a fault or from the end of a trench, but the distance is dependent upon the expert opinion of the Certified Engineering Geologist based on local site conditions.

At the San Juan School site, the planned Multipurpose Building is located approximately, about 500 feet from the trace of the San Andreas fault, and about 350 feet from the end of Trench A projected parallel to the fault, well outside the required 50-foot setback. No additional setback is warranted for this building.

The buildings to be retrofitted are located, at the closest point, about 175 feet from the mapped trace of the San Andreas fault, and about 50 feet from the end of Trench A projected parallel to the fault. Therefore, no additional setback is warranted for these buildings.

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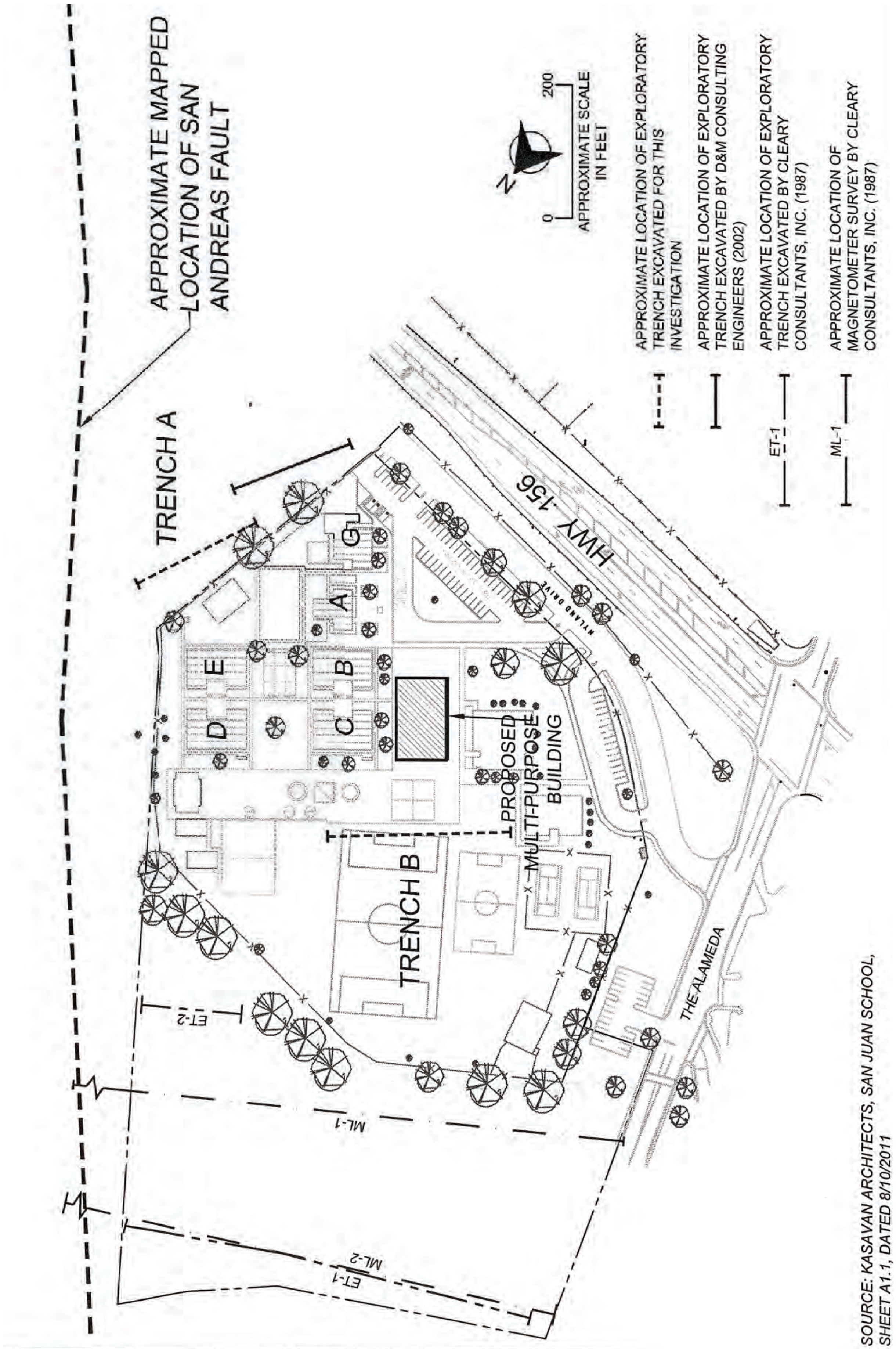
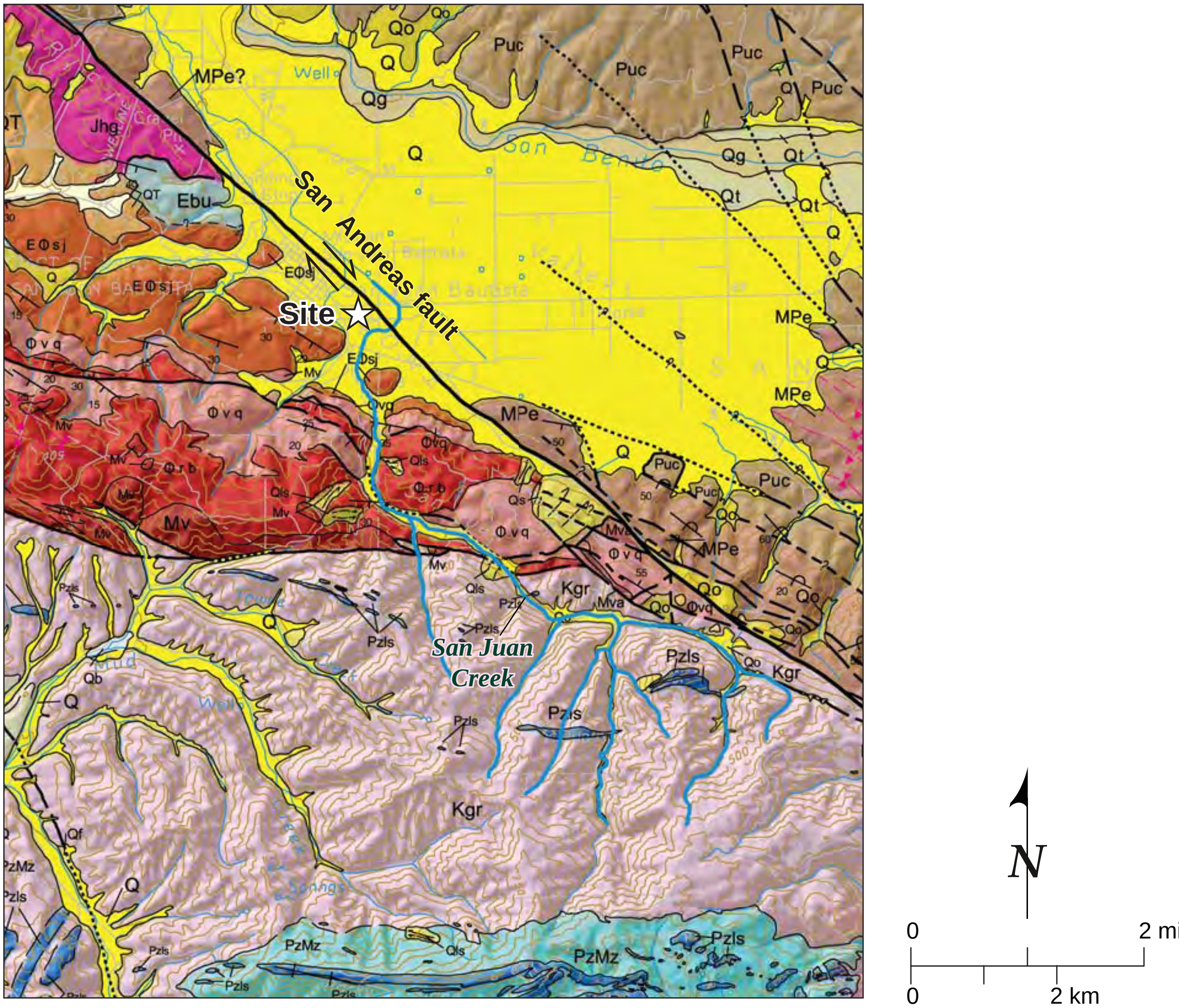


SOURCE: KASAVAN ARCHITECTS, SAN JUAN SCHOOL, SHEET A1.1, DATED 8/10/2011

Exploratory Fault Trenching and Magnetometer Survey

FIGURE 1



Explanation

Geologic Units

Q	Alluvium
Qo	Older alluvium
Qg	Stream gravel
Qt	Terrace deposits
Qls	Landslide deposits
Qf	Alluvial fan deposits
Qb	Basin deposits
QT	Plio-Pleistocene continental deposits
Qfl	Flood plain deposits
PzMz	Prebatholithic metasedimentary rocks Pzls - Carbonate rocks
Mv	Unnamed Miocene volcanic rocks
Kgr	Granitic rocks
MPe	Etchegoin Formation
Puc	Unnamed Pliocene continental mudstone
Φrb	Red beds
Φvq	Vaqueros Sandstone
EΦsj	San Juan Bautista Formation
Ebu	Unnamed Eocene sedimentary rocks

Outline of San Juan Creek

Fault, dashed where approximate, dotted where concealed, arrows show direction of movement

Note: Base map from Wagner et al., 2002.

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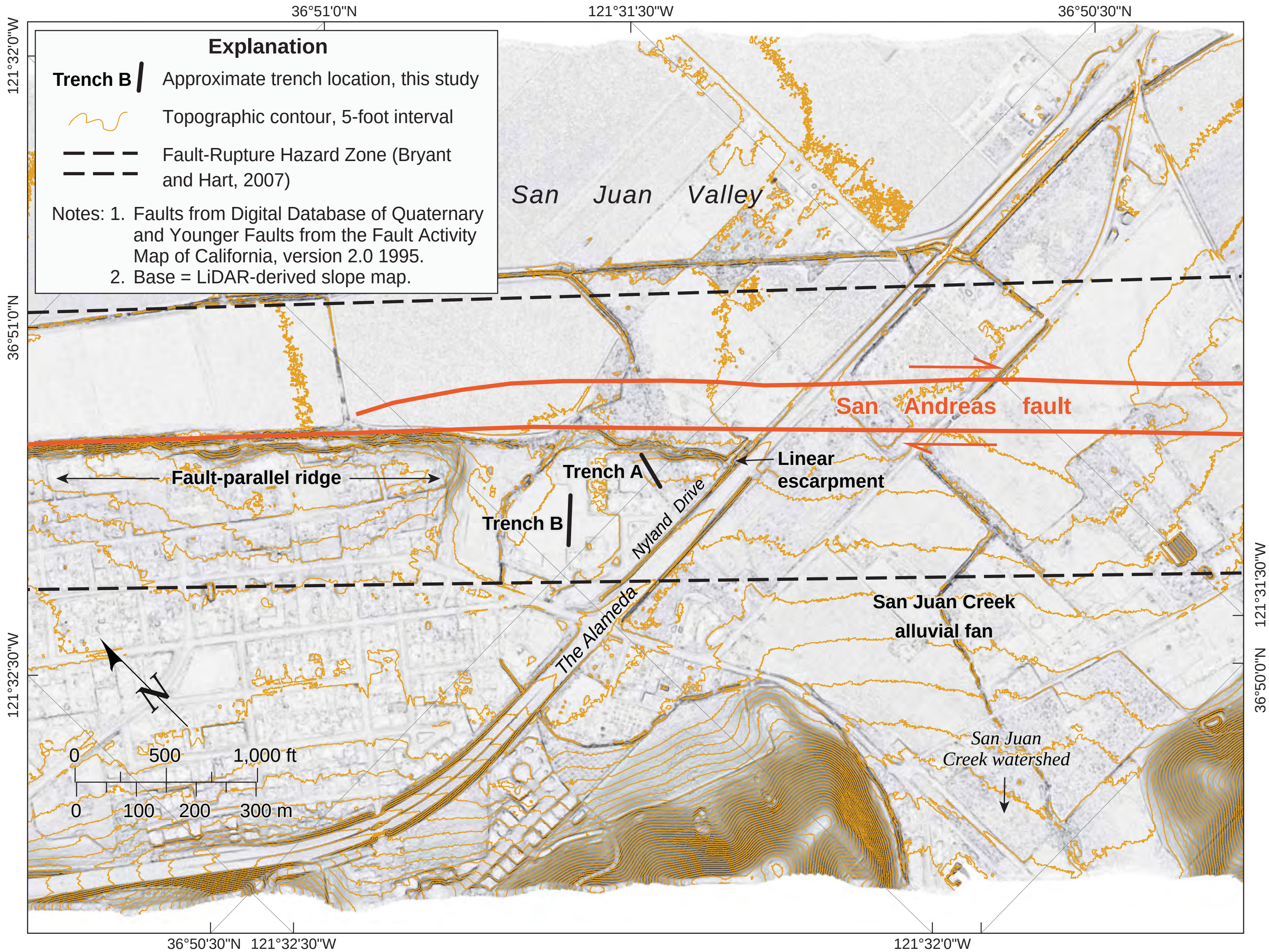
Geologic Map

FIGURE 2

GRAPHICS/Projects- 04.79224700 San Juan School Fault Investigation, modified 12.11.12



Geomorphology and Faults

FIGURE 3

Fugro Consultants, Inc.
Project No. 04.79224700 San Juan School Fault Investigation

FUGRO

Trench A

Explanation

Unit Descriptions

- **1A** POORLY-GRADED SAND (SP), fine- to medium-grained, silty, trace gravel to the northeast, 1- to 4-inch-thick fine sand stringers; pale olive to orange-brown with faint mottling; damp; laminations dip 3° to the southwest
- **1B** CLAYEY SAND (SC), fine to coarse, silty, becomes trace clay up section; orange-brown and olive; damp; weakly stratified; laminations dip 5° to the southwest
- **1C** SILTY SAND (SM); fine to coarse, trace clay, some fine gravel and cobbles; pale olive, damp, reddish yellow (7.5YR 5/8) along base; undulations in base interpreted as soft-sediment deformation
- **1D** POORLY-GRADED SAND (SP) and LEAN CLAY (CL), interbedded; sand laminations dip 6° to the southwest; base of unit is sandy clay that dips 7° to 8° to the southwest
- **2A** WELL GRADED GRAVEL (GW), gravel- to cobble-size clasts; well sorted; clast supported; rounded to subrounded; interfingers with Unit 2B; top of unit is a 1-inch-thick sand bed, orange and black; dominant clast composition is granitic, clasts were locally decomposed
- **2B** SANDY LEAN CLAY (CL), grading southwest into cross-bedded sand with iron staining inclined 20° to 30° southwest

Unit Descriptions (continued)

- **2C** WELL-GRADED SAND (SW), fine to medium grained, with cross beds and laminations, laminations dip 5° to the southwest
- **3A** WELL-GRADED SAND (SW), fine to medium, with trace clay, silt, gravel, and cobbles; red; and POORLY-GRADED SAND with gravel (SP); red; weakly cemented
- **3B** WELL-GRADED GRAVEL and POORLY-GRADED GRAVEL (GW-GP) with fine sand and silt; well developed channel morphologies; dominant clast composition is granitic, indicating the source of these deposits was San Juan Creek; granitic clasts were locally decomposed
- **4** WELL-GRADED SAND (GW), fine to coarse, silty, with gravel and cobbles; parallels the topographic slope and is interpreted as colluvial deposits
- **5** SILT WITH SAND (ML) grading down into POORLY-GRADED SAND (SP) with trace gravel, dark grayish brown, non-sticky, non-plastic. Unit constitutes the A-horizon of the soil.

Notes: 1. Unit descriptions follow the Unified Soil Classification system (UCS).
2. Colors are approximate.
3. Soil profile description is provided in Table 2 of the report.

Log of Trench A

PLATE 1

Trench B

Explanation

Unit Descriptions

- **1** LEAN TO FAT CLAY (CL-CH) with trace sand, light brown with reddish brown mottling, moist, dense, high plasticity. Base not exposed in the trench.
- **2** SANDY LEAN CLAY (CL) with fine sand and gravel, light brown with reddish brown mottling, low plasticity, abrupt wavy base
- **3A** SANDY LEAN CLAY (CL) with fine sand and gravel, light brown with reddish brown mottling, moist, firm, low plasticity, clear wavy base
- **3B** SILTY FINE-TO-MEDIUM SAND (SM), light brown with reddish brown mottling, abrupt wavy base
- **3C** CLAYEY SAND (SC) grading upwards into LEAN CLAY WITH SAND AND SILT (CL), light brown with reddish brown mottling, low to moderate plasticity, fine to coarse sand, wavy abrupt base with reddening along base from Station 0+55 to 0+77
- **4** FAT CLAY (CH), gray to dark reddish brown, moist, high plasticity. This unit was distinct in composition and color, and served as a marker bed in the southwestern portion of the trench. The base was not exposed.

Unit Descriptions (continued)

- **5A** SANDY CLAY (CL) fine to coarse, with fine gravel, grading westward to GRAVELLY SILTY SAND (SP), light brown with trace reddish brown mottling. From approximately Station 1+40 to 1+52, Unit 5A contained a 0.3-foot-thick bed of light brown, well-sorted, medium sand underlain by a dark gray clay layer of roughly the same thickness. The base of this unit was wavy and sharp; to the southwest it graded laterally into Unit 5B.
- **5B** FINE SANDY FAT CLAY (CH), dark reddish brown. Grades into unit 5A to the north-east, and into Unit 6 to the southwest.
- **5C** WELL-GRADED GRAVEL (GW) with sand and silt, and trace cobbles and boulders, light brown. Gravel clasts are subrounded and composed of Cretaceous granite, with 60 to 80 percent of clasts weathered to gruss. From approximately Station 0+33 to 0+48, Unit 5C contained rounded boulder-sized rip-up clasts of sand, similar to material of Unit 3, stained on the top with iron. To the southwest, Unit 5C pinches out, and interfingers with adjacent units. The base of this unit was wavy and abrupt, and fills a channel eroded into Unit 3.
- **6** SAND (SP) grading upward into FINE SANDY FAT CLAY (CH), dark reddish brown, with abundant disseminated carbonate nodules southwest of Station 1+90. The basal contact varied from sharp and wavy to the northeast, to gradational to the southwest.
- **7** SILT WITH SAND (ML) grading down into POORLY-GRADED SAND (SP) with trace gravel, dark grayish brown, non-sticky, non-plastic. Unit constitutes the A-horizon of the soil.

Notes: 1. Unit descriptions follow the Unified Soil Classification system (UCS).
2. Colors are approximate.

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Log of Trench B

Appendix A:
Soil Profile SJS-SP-1 Field Notes

Janet M. Sowers, Ph. D. P.G.
Fugro Consultants, Inc.

SOIL PROFILE DESCRIPTION

William Lettis & Associates, Inc.

Profile: SP-SJS-1   Site: San Juan School, San Juan Bautista

Elevation: ______   Slope: ______   Job #: 79.224700

Site description: Gentle slope on rise on the south side of the San Andreas fault, Trench A', at about 136-ft mark on the east wall

Date: 11-13-2012
Time: ______
By: JM Sowers
Ken Clark

Depth (cm)	Horizon	Boundary	Color dominant	Color mottles	Structure	Gravel (size, rnd, %)	Consistence (wet, moist, dry)	Texture	Clay films	Salts & silica	Notes: (pores, roots, HCl test samples, pH, etc.)
0 1 46	A	a s c w g i d b	10YR 4/2 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	<5% C SC SiC SCL CL SiCL S LS SL L SiL Si	— o — vf 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Dark grayish brown silt many pores Eolian ?
2 62	A/B	a s c w g i d b	10YR 4/3, 4/4 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	5-15% clay C SC SiC SCL CL SiCL S LS SL L SiL Si	- o - vf 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Brown silt Sl. more clay than above
3 88	Bt1	a s c w g i d b	10YR 4/4 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	co. Sa, 10-20% clay C SC SiC SCL CL SiCL S LS SL L SiL Si	vf 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Granitic alluvium Color transitional from A horizon maximum clay
4 128	Bt2	a s c w g i d b	7.5YR 5/4 10YR 5/6 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	co sandy <5% clay C SC SiC SCL CL SiCL S LS SL L SiL Si	vf 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	max rubification Sandy gravel, granitic alluvium
5 187	Bt3	a s c w g i d b	10YR 5/4 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	vf 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Less rubification Sandy gravel, granitic alluvium Base of channel fill
6 214	C1	a s c w g i d b	10YR 5/3 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	vf 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Stratified sandy gravel, granitic alluvium

← orn flag

Notes:

SOIL PROFILE DESCRIPTION

William Lettis & Associates, Inc.

Profile: SP-SJS-1 Site: San Juan School

Elevation: ______ Slope: ______ Job #: 079.2247

Site description: Grassy rise on neighbors property on south side of school property, Trench A, east wall @ ~136'

Date: 11-13-2012
Time: ______
By: Jim Sowers, Ken Clark

Depth (cm)	Horizon	Boundary	Color: dominant	Color: mottles	Structure	Gravel: size rnd %	Consistence: wet moist dry	Texture	Clay films	Salts & silica	Notes: (pores, roots, HCl test samples, pH, etc.)
7 286	C2	a s c w g i d b	10YR 6/3, 6/4 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL LS SL L SiL S Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Stratified sandy gravel, granitic
8 330	C3	a s c w g i d b	10YR 5/4-6/2 (d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL LS SL L SiL S Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Stratified gravel, granitic Diff't colors in diff't strata reflect Fe accum
	Bottom of Trench	a s c w g i d b	(d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL LS SL L SiL S Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	
		a s c w g i d b	(d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL LS SL L SiL S Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	
		a s c w g i d b	(d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL LS SL L SiL S Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	
		a s c w g i d b	(d) (m)	(d) (m)	m sg 1 2 3 vf f m c vc gr pl pr cpr abk sbk	f m c r sr sa a 0 10 25 50 75 100	so po ss ps s p vs vp lo vfr fr fi vfi efi lo so sh h vh eh	C SC SiC SCL CL SiCL LS SL L SiL S Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	

Notes: Granitic alluvium 60-80% of clasts are highly weathered and fall apart when struck with a hammer

Location ______ Date ______

Project / Client ______

Project no.
79.224700

San Juan School
fault investigation

Notes by Janet Sowers, PG
Nov 13, 2012
Fugro Consultants, Inc.

Location San Juan school Date 11-13-12

Project / Client Moore - Twining Assoc.

Scale

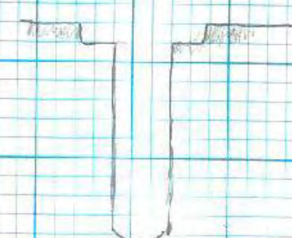
Ken Clark - Moore Twining
Jerry Thornburg - CGS
Ron Rubin - CGS

Goals:
- Describe soil and est. age
- Review logging
- Check N end of Trench B
- ~~Est~~ Identify units & extent of logging.

Charcoal sample taken from Trench A sta 174 @ 43" below string (~5ft below gs)

Ken will collect the piece of charcoal we saw in Trench B (~3 samples)

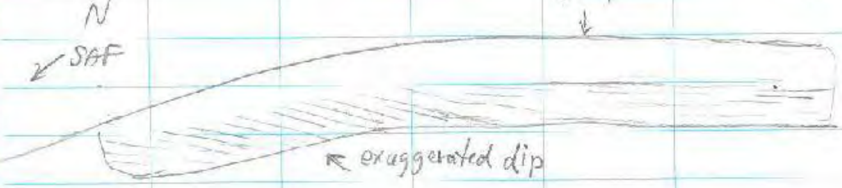
Both trenches are about 10 feet deep and have the top 1-2 feet benched to remove the soft A-horizon.



Location ______ Date ______

Project / Client ______

Trench A is located on a small rise on the south side of the school on private property. The ground gently slopes up, then steeply down to the north.
Bedding seems planar and level in the southern third of the trench. The bedding in the northern end, where the ground slopes down, slopes back 5°-8°.



The back-tilted strata are laminated sands and clayey silts, yellow-brn and gray, with planar bedding.

Location San Juan School Date 11-13-12

Project / Client ______

Scale ______

Trench B is in a flat on the NW side of the asphalt playground.
Bedding is planar throughout; no evidence of tilting.
• "Sand pillows" in the N end indicate the lower sand unit was still saturated and unconsolidated when the overlying gravel was emplaced. Thus the sand and the gravel must be similar in age.

• Vertical streaks of oxidation cross strata in the lower sand beds.
• 60-80% of granitic clasts in the gravel are highly weathered.
• The south end of the trench has a thick black soil w/ vertical cracks. No slicks, but resembles a vertisol. Prismatic structure. $CaCO_3$ zone at the base of the A horizon powdery filaments and ped coatings, fracture face coatings in a horizon ~25 cm thick
• Ron found 3 nice chunks of charcoal in the sands in the south end of the trench. Ken will collect these

APPENDIX F

FAULT INVESTIGATION REPORTS PREVIOUSLY PREPARED BY OTHERS FOR SAN JUAN SCHOOL

Geologic, Seismic and Fault Hazards Assessment Report, Proposed Kindergarten Building Addition, San Juan Elementary School, 100 Nyland Drive, San Juan Bautista, California," prepared by D & M Consulting Engineers, Inc., dated November 12, 2002.

Fault Location Investigation, San Juan Junior High School Additions, San Juan Bautista, California, prepared by Cleary Consultants, Inc., dated April 30, 1987.

01-105532

GEOLOGIC, SEISMIC AND FAULT HAZARDS ASSESSMENT REPORT
PROPOSED KINDERGARTEN BUILDING ADDITION
SAN JUAN ELEMENTARY SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

PROJECT No. 0002725

D&M CONSULTING ENGINEERS, INC.
Geotechnical/Environmental/Materials Testing
A URS CORPORATION COMPANY

01-105532

GEOLOGIC, SEISMIC AND FAULT HAZARDS
ASSESSMENT REPORT
PROPOSED KINDERGARTEN
BUILDING ADDITION
SAN JUAN ELEMENTARY SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

PROJECT No. 0002725

Prepared For: Aromas-San Juan Unified School District
c/o Kasavan Architects
60 West Market Street, Suite 300
Salinas, California 93901

Attention: Mr. Thomas J. Cravens

November 15, 2002

November 15, 2002
Project No.: 0002725

Aromas-San Juan Unified School District
c/o Kasavan Architects
60 West Market Street, Suite 300
Salinas, California 93901

Attention: Mr. Thomas J. Cravens

Subject: Geologic, Seismic and Fault Hazards Assessment, Proposed Kindergarten Building Addition, San Juan Elementary School, 100 Nyland Drive, San Juan Bautista, California

Ladies and Gentlemen:

D&M/Terratech is pleased to submit our combined Geologic, Seismic and Fault Hazards Assessment report for the proposed addition to the kindergarten building at San Juan Elementary School site in San Juan Bautista.

This investigation involved research and review of existing geologic and seismic documents, interpretation of aerial photographs, subsurface exploration by means of both drilling and trenching, and laboratory testing of soil samples. The investigation was undertaken at the same time as the project geotechnical study, which will be presented as a separate report. The most significant findings from our hazard assessment are briefly summarized as follows:

- The site is underlain by several hundred feet of dense predominantly alluvial sand, silt, and gravel. These alluvial deposits rest on older sedimentary rock with granitic and metamorphic basement rock at greater depths.

- Groundwater was measured at 28-feet below the ground surface but is expected to fluctuate seasonally. We estimate that the high groundwater level could be as shallow as 18 feet deep.

- The San Andreas fault passes within about 300 feet of the project site. Exploratory trenching of an adjacent private lot approximately 90 feet east of the building site did not reveal evidence of subsidiary faulting, shear zones, offsets, folding, or other ground deformation related to faults or liquefaction within the depth of the trench. In spite of the proximity of the San Andreas fault, we consider the hazard due to fault rupture, fault creep, or other earthquake ground disturbance to be low.

12 Thomas Owens Way Monterey, California 93940 831 372 3716 Tel 831 372 7481 Fax
3194 De La Cruz Blvd., Suite 19 Santa Clara, California 95054 408 297 6969 Tel 408 297 7716 Fax
1500 Graham Hill Road, Unit B Santa Cruz, California 95060 831 458 4383 Tel 831 458 4388 Fax

- The San Andreas fault and related faults of the San Andreas system dominate the seismic hazard of the site and surrounding areas. A major earthquake on one of the nearby faults is expected to cause intense ground shaking at the site. We estimate that the peak horizontal ground acceleration resulting from an Upper-Bound Earthquake (UBE) event having a 10% chance of occurrence during a 100-year period will be 0.74g. We estimate the peak horizontal ground acceleration from a Design-Basis Earthquake (DBE) having a 10% chance of occurrence during a 50-year interval will be 0.63g. Response spectra for both UBE and DBE events have been provided for seismic design of the proposed building addition.

- The site was found to have a low potential for liquefaction-related hazards due to the relatively dense alluvium encountered beneath the design groundwater level.

- The hazard due to the proposed improvements as a result of landsliding is considered to be negligible.

- There is a low to moderate hazard posed by expansive soils and mitigation measures will be provided in the geotechnical report.

- The Kindergarten Building Addition site is outside of the 100-year flood inundation zone but may experience flooding of less than one-foot in depth with a 100-year event.

- The western portion of the San Juan Elementary School site is within the 100-year flood inundation zone. This will need to be considered in future projects at the site.

We appreciate the opportunity of providing our services to you on this project. We trust that this report meets your needs at this time. If you have any questions concerning the information presented, please contact our Santa Clara office for assistance.

Sincerely,
D&M CONSULTING ENGINEERS, INC./TERRATECH
A URS CORPORATION COMPANY

Mark R. Petersen

CERTIFIED ENGINEERING GEOLOGIST
MARK R. PETERSEN
No. EG1332
Exp. 10/31/04
STATE OF CALIFORNIA

Mark R. Petersen CEG 1332
Consulting Engineering Geologist

Gregory J. Ruf

Gregory J. Ruf, P. E.
President/Principal Engineer

cc: Addressee (6)

GEOLOGIC, SEISMIC AND FAULT HAZARDS ASSESSMENT REPORT
PROPOSED KINDERGARTEN BUILDING ADDITION
SAN JUAN ELEMENTARY SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

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SAN JUAN BAUTISTA, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of a combined geologic, seismic and fault hazards assessment performed for a proposed building addition to an existing kindergarten building at the San Juan Elementary School in San Juan Bautista, California. San Juan Elementary School is located in southeast San Juan Bautista at 100 Nyland Drive, east of The Alameda and north of Highway 156 as shown on Figure 1 – Location Map. The project site lies at latitude 36.8414°N and longitude 121.5300°W.

1.1 PROJECT DESCRIPTION

The proposed addition to the existing kindergarten building is to be a 1,400 square-foot, single-story, wood-frame structure with slab-on-grade floor. Other project improvements will include reconfiguration of the parking lot immediately southwest of the kindergarten building, reconfiguration and expansion of the parking lot south of the gymnasium (Building H), landscaping, and removal or relocation of an existing modular classroom. Kasavan Architects, the project architect, has provided a site plan showing the locations of the proposed improvements. This drawing has been used to prepare Figure 2, Site Plan, which shows the locations of the exploratory boring and fault trench made for this investigation.

Although no preliminary building loads are available, we expect that foundation loads will be relatively low, consistent with the proposed single-story wood-frame construction. The site is relatively level and only minor grading for the building pad and parking lots is expected with cuts and fills not likely to exceed 4 feet.

1.2 PURPOSE AND SCOPE

The purpose of this combined geologic, seismic and fault hazards assessment was to identify and evaluate geologic and seismic hazards that could potentially impact the proposed project and to provide a basis for developing hazard mitigation, should any be needed. A geotechnical investigation, being conducted at the same time as this geologic, seismic and fault hazards investigation, will be presented in a separate report.

The site is within a Sate of California Special Studies Zone (Alquist-Priolo Earthquake Studies Zone) and lies about 300 feet southeast of the mapped trace of the San Andreas fault. To address particular concerns due to the proximity of the San Andreas fault, and to meet State requirements for public school construction, our investigation included a fault study. The scope for our combined geologic, seismic and fault hazards assessment consisted of the tasks listed below.

- Review of available geologic and seismic literature relevant to the site including published mapping;

- Performance of a limited site reconnaissance and review of aerial photographs pertinent to the site for geomorphic evidence of faulting, ground movement, or other geologic hazards (aerial photographs used in this study are identified in References);

- Exploration of subsurface soil and groundwater conditions by means of a 40-foot deep hollow stem auger boring;

- Testing of subsurface soils in-situ and in the laboratory to measure engineering properties pertinent to liquefaction analysis;

- Exploration of near-surface soils by means of a 192-foot-long trench excavated on adjacent private land to evaluate the hazard posed by fault rupture, ground cracking, or other seismic ground deformation;

- Estimation of the Upper-Bound Earthquake (UBE) and Design Basis Earthquake (DBE) ground motions, response spectra, and seismic design parameters in light of the current understanding of the regional seismic framework;

- Calculation of the potential for liquefaction and related ground effects; and

- Preparation of this report to summarize our findings, conclusions and recommendations.

2.0 SITE AND GEOLOGIC CONDITIONS

2.1 Site Description

The school site is situated at the southeast edge of San Juan Bautista and lies at an elevation of about 208 feet MSL near the western margin of San Juan Valley. The San Benito River, roughly 1-3/4 miles to the north, drains the San Juan Valley, flowing northward to join the Pajaro River. The foothills of Gabilan Range rise from the valley about one-quarter mile southwest of the school.

The San Juan Elementary School site is bounded on the southwest by The Alameda and a portion of Nyland Drive, on the southeast by Nyland Drive, and to the east and northeast by the San Benito County Line. A tributary to San Juan Creek is located along the northern limits of the site.

The site of the kindergarten addition (Photo 1, Appendix A) is essentially level as are the adjacent school grounds. Paved walkways, playgrounds and lawn presently occupy the building addition site. Just beyond the northeast boundary of the school property is a low, generally northwest-trending descending scarp that represents the main trace of the San Andreas fault (Photo 2, Appendix A). The geomorphic expression of the San Andreas fault across the San Juan Valley at San Juan Bautista is apparent on stereo-paired aerial photographs and is clearly shown by the 3-D rendering of the topography shown on Figure 3 (vertical exaggeration: 8X). At its nearest approach to the kindergarten building addition site, the top of the scarp lies just over 200 feet to the northeast. In the immediate vicinity of the project, the scarp falls approximately 15 to 20 feet at gradients ranging from 4 to 1 (Horizontal to Vertical) to as steep as 2.7 to 1. At the toe of the scarp is a subtle linear depression that is largely unimproved, poorly drained, and covered by a dense growth of brush and trees (Photo 2, Appendix A). Topographic expression and vegetation both strongly suggest the depression is a sag pond along the San Andreas fault.

2.2 Geologic Setting

San Juan Bautista lies within the central section of the Coast Ranges physiographic province of California. This province consist of mountain ranges of moderate elevation extending some 600 miles northwest along the California coastline from the Transverse Ranges in the south to beyond the California-Oregon border. Ridges and valleys within the province, such as San Juan Valley and the Gabilan Range, are primarily controlled by geologic structure and follow the general northwest trend of regional faults or folds.

The distribution of geologic materials in the vicinity of the site is shown on Figure 4 – Geologic Map. San Juan Elementary School is underlain by alluvium of the San Juan Valley, Tertiary sedimentary rocks, and, at depth, granitic and metamorphic basement rock of the Salinian Block. Allen (1946) described the alluvium at the site as non-marine terrace deposits derived largely from granitic rock. The thickness of alluvium beneath the site exceeds the 40-foot maximum depth of our drill hole. Judging from the proximity of the Gabilan Range foothills, depth to rock is estimated to be on the order of 100 to 300 feet below ground surface. Bedrock is expected to consist of Oligocene-age marine siltstone, claystone and sandstone of the San Lorenzo Formation (Dibblee and others, 1979).

The active San Andreas fault lies approximately 300 feet northeast of the building site and is probably coincident with the toe of the low, northwest-trending linear scarp (Photo 2, Appendix A; Figure 3). The San Andreas fault separates the granitic and metamorphic basement rock of the Salinian Block on the southwest from sedimentary basement rock of the Mesozoic Franciscan Assemblage to the northeast. The San Andreas fault is a right-lateral, strike-slip fault extending northwest from the Gulf of California to Cape Mendocino. The San Andreas fault and related faults of the San Andreas fault system form the boundary between the North American and Pacific tectonic plates and dominate the seismic hazard of the region.

2.3 SUBSURFACE CONDITIONS

Subsurface conditions were explored by a 41-1/2 foot deep hollow-stem auger boring and a 192-foot-long backhoe trench. The locations of the boring and trench are shown on Figure 2 – Site Plan. Samples taken during drilling were recovered at select depths for visual inspection and laboratory testing. The samples were taken using a 2-inch diameter O.D. standard penetration test (SPT) sampler without sleeves and a 2.5-inch O.D. split-spoon sampler fitted with brass sleeves. The samplers were driven into the soil using a 140-pound hammer falling 30 inches. The soils were classified using the Unified Soil Classification System. The detailed soil log from boring B-1 is presented in Appendix B. The trench log is presented as Plate 1.

Within the maximum depth of our exploration, the building site is underlain by alluvial sand containing variable amounts silt, gravel and clay. Shallow soils encountered during trenching required the use of rock teeth on the 30-inch backhoe bucket due to the dense state of the deposits. Near-surface soils exhibit a moderately well-developed soil profile and clay has become concentrated in some soil horizons (particularly B_t and B_{tk} horizons) within the upper 5 to 7 feet. Although no laboratory age dating was conducted, moderately developed soil profile, rubification of soils and the presence of stage 1 carbonate morphology strongly suggest pre-Holocene deposits. Aside from these shallow clay-rich horizons and a 9-foot-thick clay layer below a depth of 21 feet, most of the alluvium consists of dense to very dense granular deposits within the depth of exploration. The trench exposure reveal that near-surface deposits consist of interbedded fluvial sand, silt and granitic gravel. A geologic cross-section showing inferred subsurface conditions beneath the site is presented as Figure 6.

Groundwater was encountered at a depth of 28 feet at the time of our exploratory drilling (October 2002). The depth to groundwater can be expected to fluctuate both seasonally and from year to year. Considering the expected seasonal ponding at the bottom of the nearby scarp, the high groundwater level at 18 feet deep was conservatively assumed for our liquefaction analysis.

3.0 GEOLOGIC HAZARDS

3.1 Faulting and Seismicity

3.1.1 Regional Seismicity and Faulting

The school site is located in seismically active central California. The seismicity of the area is dominated by the San Andreas fault and related faults of the San Andreas fault system. Numerous large and destructive earthquakes have occurred during historic times and attest to the seismicity of the area. The historic San Juan Bautista Mission, 0.4 miles northwest of the school, was severely damaged as a result of earthquakes on the San Andreas fault in October 1800 and April 1906.

A computer search of historic earthquakes was made using the computer program EQSEARCH (Blake, 1996) to identify earthquakes that have occurred in the vicinity of the site. The search included: (1) earthquakes of magnitude M5.0 or greater within 100 kilometer (62 miles) of the site and (2) earthquakes of magnitude M6.0 or greater within 161 km (100 miles) that have occurred during the 201-year interval between the 1800 and 2000. The records indicate that during this period, 76 earthquakes of estimated magnitude M5.0 or greater have occurred within 62 miles of the site and 21 earthquakes of magnitude M6.0 or greater have occurred within 100 miles. A list of these earthquakes is presented in Appendix C.

Although the epicenter of the 1906 San Francisco Earthquake is thought to have been located 80 miles northwest of the site, ground rupture reportedly extended southward to within ½ miles of San Juan Bautista (Lawson, 1908, pg 38). Right-lateral offset of 4-feet was reported 3 miles northwest of San Juan Bautista and 3-1/2 feet of offset was measured between railroad bridge abutments at nearby Pajaro Gap. San Juan Bautista lies at the transition between locked and actively creeping sections of the San Andreas fault. On-going co-seismic displacement (creep) has offset roads, fences, and other cultural features in the vicinity of the school. Fault creep has been monitored since the 1960s on the Nyland Ranch Array, adjacent the school property. A creep rate of 9 mm/yr has been measured on this array over the 35 years between 1967 and 2002 with short-term rates ranging from 7 mm/yr to 12 mm/yr
(http://www.geol.ucsb.edu/~geodesy/nail_lines/X00070_NYLAND_RANCH_NL.html).

While the San Andreas fault dominates the seismic hazard at the site due to its proximity, activity and potential to generate large earthquakes, many nearby regional faults are also capable of causing strong ground shaking and contribute to the seismic hazard. A regional fault map is shown on Figure 7. Major regional active faults, including their distance from the site, seismic source type, average slip rate, and maximum moment magnitude are summarized in Table 1 – Significant Active Faults.

TABLE 1
SIGNIFICANT ACTIVE FAULTS

Fault Name	Seismic Source Type[1]	Closest Distance to Site (km)	Moment Magnitude of Maximum Earthquake (Mw)[1]	Slip Rate (Mm/ Yr)[1]
San Andreas (Creeping)	A	0	6.5[3]	34
San Andreas (1906)[2]	A	3	7.9	24
Zayante-Vergeles	B	4	6.8	0.1
Sargent	B	7	6.8	3
Calaveras (South)	B	10	6.2	15
Quien Sabe	B	17	6.5	1
San Andreas (Santa Cruz Mtns)	A	19	7.0	14
Rinconada	B	27	7.3	1
Monterey Bay - Tularcitos	B	39	7.1	0.5

1 From Working Group (1996)

2 Includes Pajaro, Santa Cruz Mtn, Peninsula, and North Coast Segments

3 Creep releases most strain along this segment. A possible M>6.0 is assumed as background but not from a discrete source.

3.1.2 Surface Faulting

As shown on Figure 5, the school site lies within an Alquist-Priolo earthquake fault zone. As previously discussed, the active trace of the San Andreas fault has been mapped about 300 northeast of the proposed building addition site. While no surface features suggestive of past faulting or ground deformation of the site were observed in the field or identified by aerial photograph review, a trenching study was performed to confirm the absence of subsidiary traces of the San Andreas fault beneath the proposed building addition site and evaluate the hazard posed by earthquake related ground deformation. Since trenching at the existing kindergarten building was complicated by the presence of underground utilities, pavements, concrete hardscape, and other improvements (Photo 1), the trench was excavated on adjacent private land as shown on Figure 2 and Photo 3. Subsurface conditions adjacent the school property were explored by means of a 192-foot long trench ranging from 7 to 8 feet in depth. The trench extended more than 50 feet beyond the projection of the building addition toward the mapped trace of the San Andreas fault. The trench was continued as far to the southwest as possible given the constraints imposed by a driveway (sole access to an occupied private residence) and underground utilities.

The trench sidewalls were cleaned, examined, and logged by a California Certified Engineering Geologist who prepared the trench log attached as Plate 1. The trench exposed a moderately developed soil profile exhibiting A, Bt, Bk, and C soil horizons. These horizons appeared laterally continuous and undeformed throughout the length of the trench. The weak to medium soil structure in the soil horizons is attributed to the paucity of clay in the soil. Stage 1 carbonate morphology was present (Bk horizon) throughout the entire trench. A locally discontinuous, near-horizontal layer of cobble-size granitic clasts (labeled "stones" on the trench log, Plate 1) was found to extend a distance of at least 114 feet within the C horizon alluvium between stations 0+71 and 1+85 (Photo 4). Clearly defined, near-horizontal lenses of coarse sand and gravel could be clearly traced undisturbed throughout most of the trench length. No fossil fissures, clastic dikes, soil tongues, or other features suggestive of ground disturbance due to lateral spreading or sand boils was observed.

Considering the absence of observed shear zones, offset, folding, or tilting of exposed soil horizons and alluvial beds, it is our opinion that, in spite of its proximity to the San Andreas fault, the site is not particularly prone to surface rupture, creep, or earthquake related ground deformation.

3.1.3 Strong Ground Motion

This site is located within California Building Code Seismic Zone 4. Seismic parameters for design based on the Static Force Procedure are as follows:

Seismic Zone Factor, Z:	0.4
Soil Profile Type:	S_D
Seismic Coefficient, C_a:	0.66
Seismic Coefficient, C_v:	1.28
Near-Source Factor, N_a:	1.5
Near Source Factor, N_v:	2.0

The U.S. Geological Survey (USGS) has developed a probabilistic seismic hazard model based on the current understanding of regional tectonics (Frankel and others, 1996). The results of this work are now available over the internet (http://eqint.cr.usgs.gov/eq/html/custom.shtml) with seismic response provided for "firm rock" sites at various hazard levels. In this model, "firm rock" is considered to be defined as an earth material intermediate between soil types S_B and S_C with a shear-wave velocity of 760 m/s averaged over the upper 30 meters of depth. The "firm rock" ground acceleration values calculated by the USGS at the site for a 10% in 50 year event (Design-Basis Earthquake - DBE) and 10% in 100 year event (Upper-Bound Earthquake - UBE) were adjusted to account for the deep, predominantly cohesionless alluvium overlying the rock. Surface ground motions were estimated using the methods proposed by Seed and others (2001) and the calculated Peak Horizontal Ground Accelerations are as follows:

Hazard Level	Event Return Period (years)	Peak Horizontal Acceleration (g) – Firm Rock	Peak Horizontal Acceleration (g) – Ground Surface
10% in 50 years (DBE)	475	0.77	0.63
10% in 100 years (UBE)	949	1.01	0.74

Response spectra for the site were also developed for the DBE and UBE earthquake events using the procedure proposed by Seed and others (2001). These spectra are shown in Figure 9.

3.2 LIQUEFACTION

Liquefaction is a phenomenon whereby the shear strength of saturated, loose, cohesionless soils diminishes as a result of increasing pore pressures generated by the repeated cycles of seismic shaking. The effects of liquefaction may include reduced soil support beneath foundations, lateral spreading, and localized settlement of the ground surface.

The liquefaction potential of the site was evaluated using the computer program LIQUEFY2 (ver. 1.50) by Thomas F. Blake, Computer Services & Software. Input parameters included:

rd factor based on:	NCEER (1997) rd factor
Rod length correction:	3.0 feet of stick up
Magnitude Scaling Factor (MSF):	Idriss (1997)
calculated water depth:	15 feet
Earthquake magnitude:	7.9
Acceleration:	0.74g
Surcharge:	none
Sampler correction:	1.0
Borehole correction:	1.15
Hammer correction:	0.8

The calculations indicate that the relatively dense granular alluvium underlying the site will not liquefy even under the conservative combination of high groundwater and upper-bound earthquake ground motions.

The results of these calculations are further supported by the apparent absence of evidence for liquefaction-related ground disturbance in our exploratory trench, performance of the historic Nyland Adobe site and adjacent scarp (300 feet southeast of the school addition site), and the absence of reported liquefaction features in this area during historic earthquakes (Youd and Hoose, 1978; Holtzer, 1998). The alluvial soils underlying the site are very likely pre-Holocene and are likely to have a higher resistance to liquefaction than the calculations would suggest (Youd and Idriss, 1997, pg. 32).

3.3 SLOPE STABILITY AND EROSION

The proposed building addition site and surrounding school grounds are essentially level. The top of the low scarp along the San Andreas fault is located more than 200 feet to the northeast. Considering the absence of nearby slopes, the hazard posed by deep-seated or shallow landsliding is considered to be negligible.

The level area surrounding the proposed building will be landscaped or protected by pavements or slabs-on-grade. Consequently, the site is considered to have a low potential for erosion.

3.4 FLOODING, TSUNAMIS AND SEICHES

The school is located nearly 2 miles from the San Benito River. There is a tributary to the San Benito River located just north of the school property. The site of the proposed Kindergarten building addition is outside of the 100-year flood inundation zone (FEMA, 1991). This portion of the school campus is within FEMA Zone X, which is within the 500-year flood zone, with an average flood depth of less than 1 foot associated with the 100-year flood event. Thus, flooding at the Kindergarten building is not considered to be a significant hazard. Nevertheless, surface drainage of the building site should be designed to discourage ponding of water during extended periods of precipitation. Although the Kindergarten building and the eastern portion of the school site are outside of the 100-year flood inundation zone, the western side of the site is mapped as being in Zone AE, as shown on the partial FEMA map included as Figure 8. . This area is subject to flooding, with flood elevations generally between elevations 205 and 206 feet (National Geodetic Vertical Datum of 1929) in the area of a few existing buildings.

Tsunamis are destructive waves triggered during earthquakes by displacement of the ocean floor or by coastal or underwater landslides. The kindergarten building addition site lies at an elevation of more than 200 feet above mean sea level and a distance of over 14 miles inland so the potential hazard posed by Tsunamis is considered to be negligible.

A seiche is a wave that occurs as a result of sloshing of an enclosed body of water during an earthquake. The potential hazard posed by seiche waves is negligible considering the relatively great distance to San Francisco Bay or the nearest lakes and reservoirs.

Failure of a reservoir resulting in the release of significant amounts of impounded water could cause widespread flooding in the surrounding lowlands. San Justo Reservoir is located approximately 4.9 miles southeast of the school site. Based on our review of the inundation map for dam breach at San Justo (U.S. Bureau of Reclamation, 1999), we find that the San Juan Elementary Campus is outside of the inundation zone. There are no other water storage facilities upslope or upstream from the school site.

3.5 EXPANSIVE SOILS

Near-surface soils encountered in our exploratory boring and trench generally consist of non-plastic silt and lean clay. These soils have a low potential for expansion as demonstrated by the low Plasticity Index of the soils. The low plasticity and rubification (reddening) of the clay-rich B_t horizon exposed in the exploratory trench suggests that much of the clay has weathered to Kaolinite and, consequently, the near-surface clays are not expected to be particularly expansive. Recommendation for site drainage, earthwork, and design of foundations and slabs are given in the companion geotechnical report for this project and will address this potential hazard. Prudent design of surface drainage and design of foundations can mitigate this potential hazard.

3.6 COMPRESSIBLE SOILS AND SETTLEMENT

The site is underlain by dense older alluvial deposits that are not prone to liquefaction. The relatively low anticipated loads imposed by the single-story wood-frame building addition are not expected to induce any significant compression of the underlying soils when they are supported on properly design foundations. Considering the absence of loose non-cohesive deposits underlying the site, significant seismic settlement is not likely to occur in the event of a strong earthquake.

3.7 VOLCANIC HAZARDS

There are no known Quaternary volcanoes in the vicinity of the site (Jennings, 1994). A major volcanic eruption from a distant volcanic sources, such as Mono Lake-Long Valley or Cascade Range volcanoes, poses a minor risk that more than 5 cm of ash will fall at the school site (http://www.usgs.gov/themes/map2.html).

4.0 LIMITATIONS

This report was prepared in accordance with the generally accepted standards of engineering geology that existed in San Benito County at the time the report was written. No other warranty, express or implied, is made. Note that changes in the standards of practice in the fields of geology and seismology, Code changes and new agency regulations will likely occur with time. In light of this, there is a practical limit to the usefulness of this report without critical professional review.

This report is intended for use only by the Aromas-San Juan School District and their consultants and only for the project described above, within a reasonable time from its issuance. Note that changes in the standards of practice in the field of engineering geology, changes in site conditions such as new excavations or fills, new agency regulations, or modifications to the proposed project are grounds for this report to be professionally reviewed. In light of this, there is a practical limit to the usefulness of this report without critical professional review. The maximum useful life of this document is considered to be three years, after which time the report should be reviewed for compliance with applicable regulations and the standard of practice. Any party other than the Aromas-San Juan School District or their architect, Kasavan Architects, wishing to use this report should notify D&M/Terratech of their intent. Based on the intended use of the report, D&M/Terratech may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release D&M/Terratech from any liability resulting from the use of this report by any unauthorized party.

The conclusions of this report are for the Kindergarten Building Addition site at San Juan Elementary School Site in San Juan Bautista, California, as described in this report and are based on information obtained from the following:

- Review of referenced aerial photographs;
- Review of referenced engineering geologic reports and geologic maps and reports;
- The observations of our Certified Engineering Geologist; and
- Subsurface exploration information obtained at the site.

While much of the information contained in this report is relevant to the school site in general, additional subsurface exploration consisting of geotechnical borings and trenching will be required for future projects at the site. The borings will be required to evaluate the liquefaction and expansion potential of the soils, and trenching will be needed to evaluate future building for the potential presence of faulting or fault related ground cracking associated with the San Andreas fault. The conclusions in this report are invalid if the report is used for adjacent or other properties.

The logs of the exploratory boring and trench do not provide a warranty as to the conditions that may exist beneath the entire site. The extent and nature of subsurface soil and groundwater variations may not become evident until construction begins. It is possible that variations in soil conditions and depth to groundwater could exist beyond the points of exploration that may require additional studies, consultation, and possible design revisions. Subsurface exploration of any site is necessarily confined to selected locations. Conditions may, and often do, vary between and around such locations. Should conditions different from those encountered in our exploration come to light during project development, additional exploration, testing and analysis may be necessary; changes in project design and construction may also be necessary. Any person concerned with this project who observes conditions or features of the site that are different from those described in this report should report them to D&M Consulting Engineers immediately for evaluation.

5.0 REFERENCES

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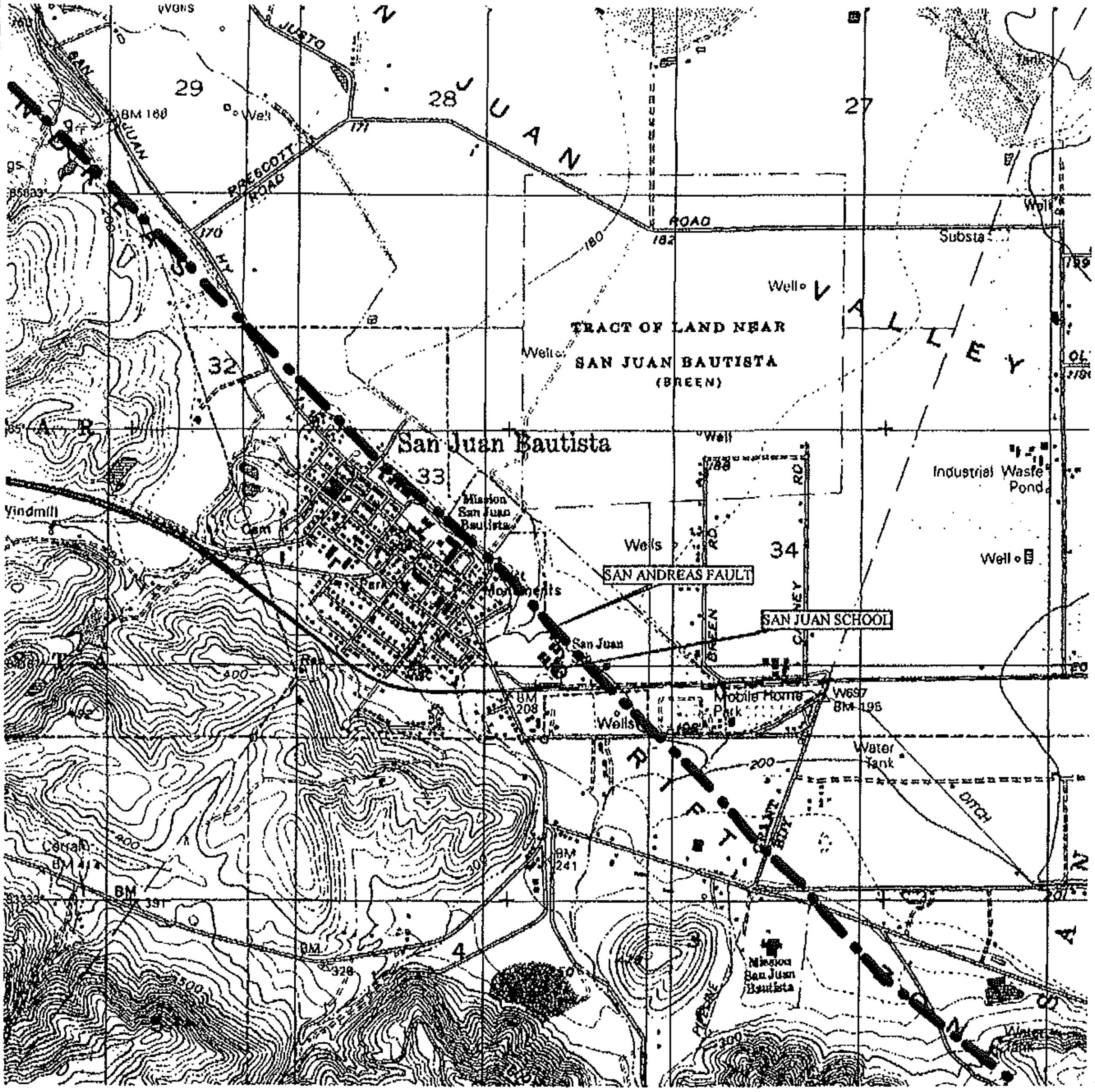
Youd, T.L., and Idriss, I.M. (ed), 1997, Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils, Technical Report NCEER-97-0022, 276 p.

Aerial Photographs

Date	Frames	Source	Flown By	Scale	Type
9-21-97	16-124 &125	WAC	WAC	1:24,000	B/W
10-26-89	1-1	Unknown	Airflight Service	1:6,800	B/W
4/2/85	6-183&184	Unknown	WAC	1:31,680	B/W
4-12-80	279-137&138	USDA	WAC	1:40,000	B/W
5/8/73	1-3&4	USGS	Cal Aero Topo	1:10,000	Color
7/27/52	14-56GS-WL&57	USGS	Unknown	1:23,600	B/W
8/2/49	BUX-14F-2&3	USDA	Park Aerial	1:20,000	B/W
6/10/39	BUX 260-11&12	USDA	Fairchild Aerial Surveys	1:20,000	B/W



Latitude: 36.8413 North
Longitude: −121.5200 West

MAP REFERENCE: 3-D TopoQuads Copyright 1999
DeLorme Yarmouth, ME 04096
Source Data: USGS

SCALE: 1 = 24,000

November 2002

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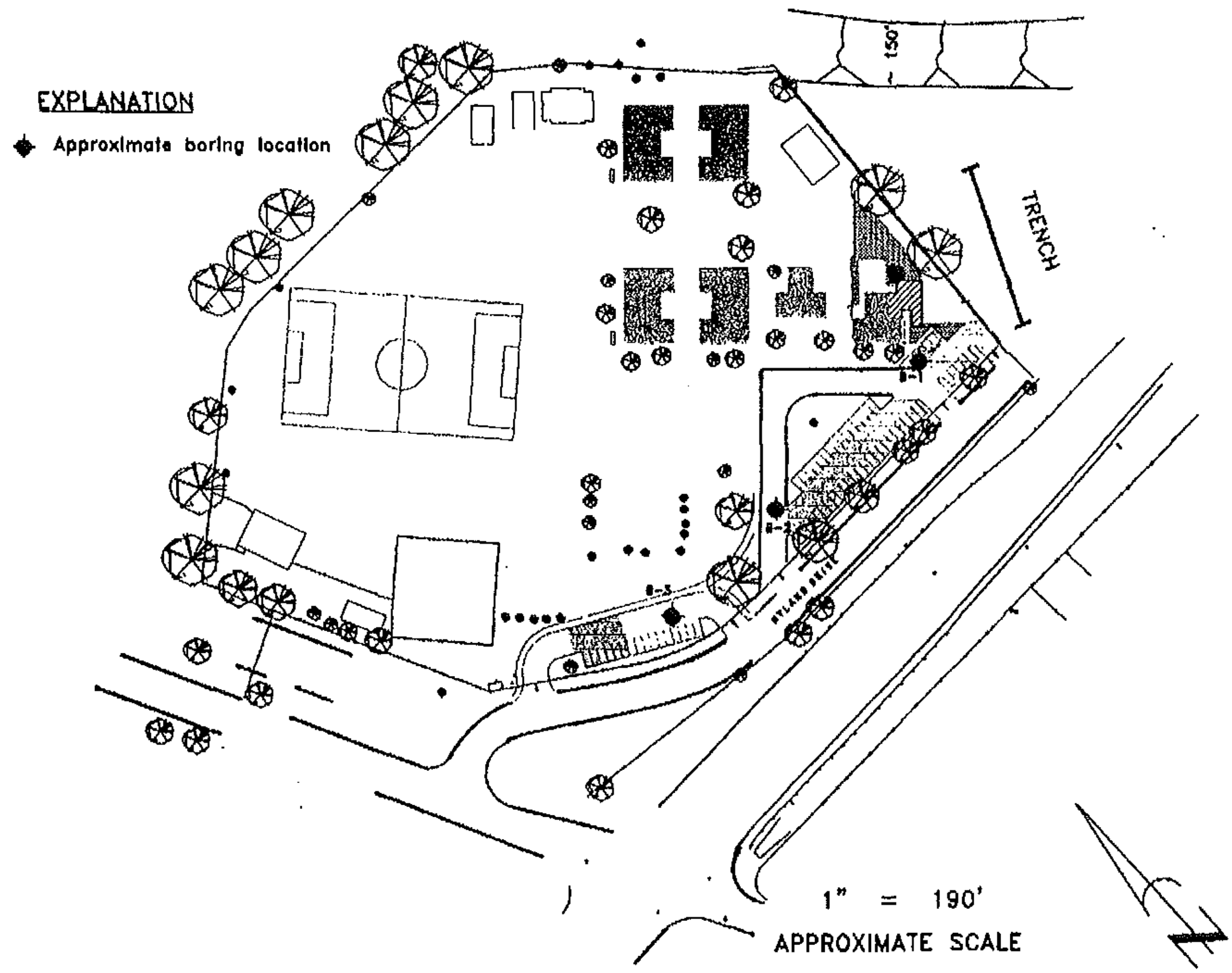
LOCATION MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
1
PROJECT
2725



1" = 200'
Approximate Scale
At 8-1/2" x 11"

Base drawing provided by Kasavan Architects, modified by D&M Consulting Engineers, Inc.

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D&M CONSULTING ENGINEERS, INC.
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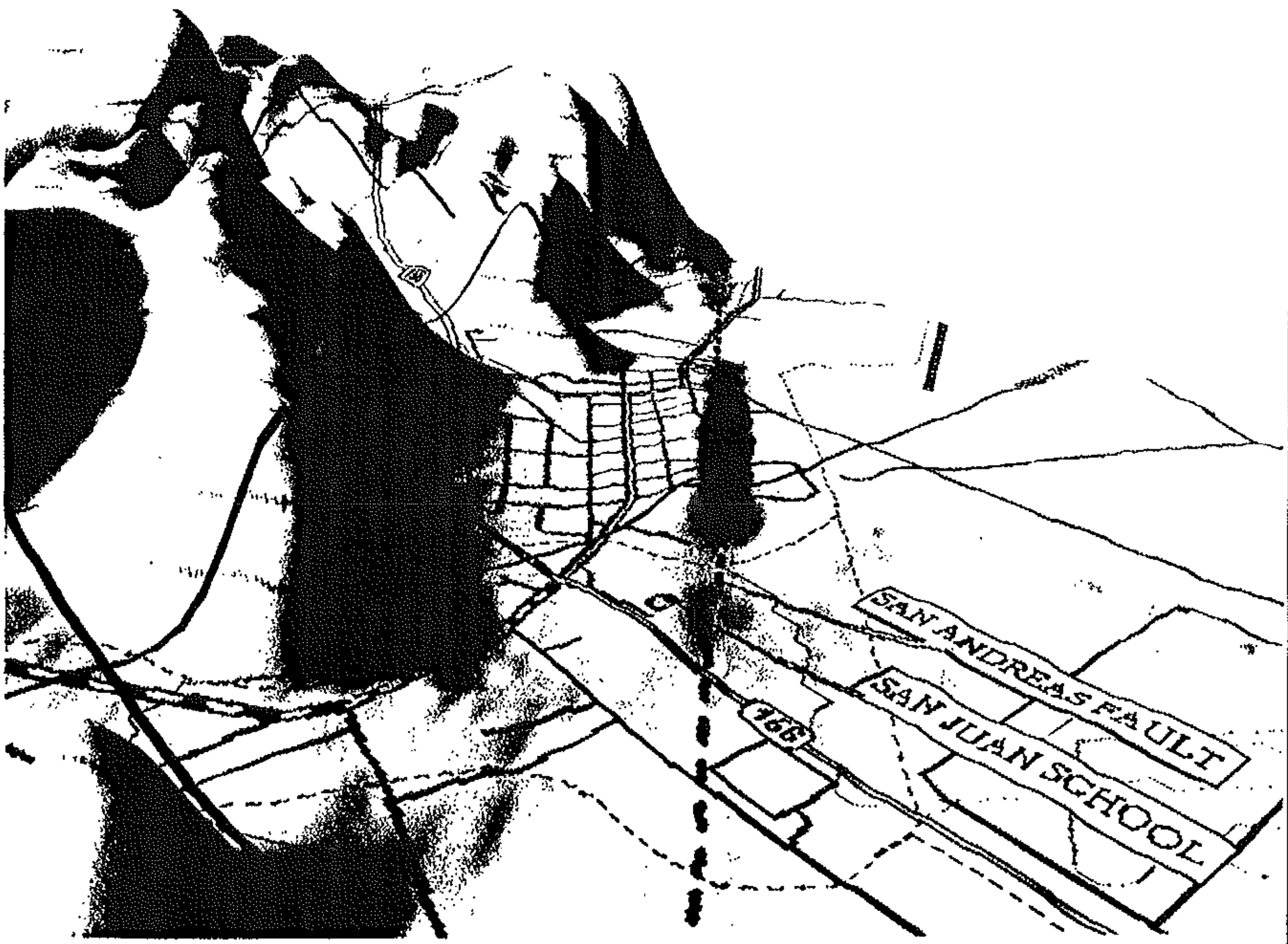
SITE PLAN
Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
2
PROJECT
2725



REFERENCE: 3-D TopoQuads Copyright 1999 DeLorme Yarmouth, ME 04096
Detail 12-7 Datum: NAD27

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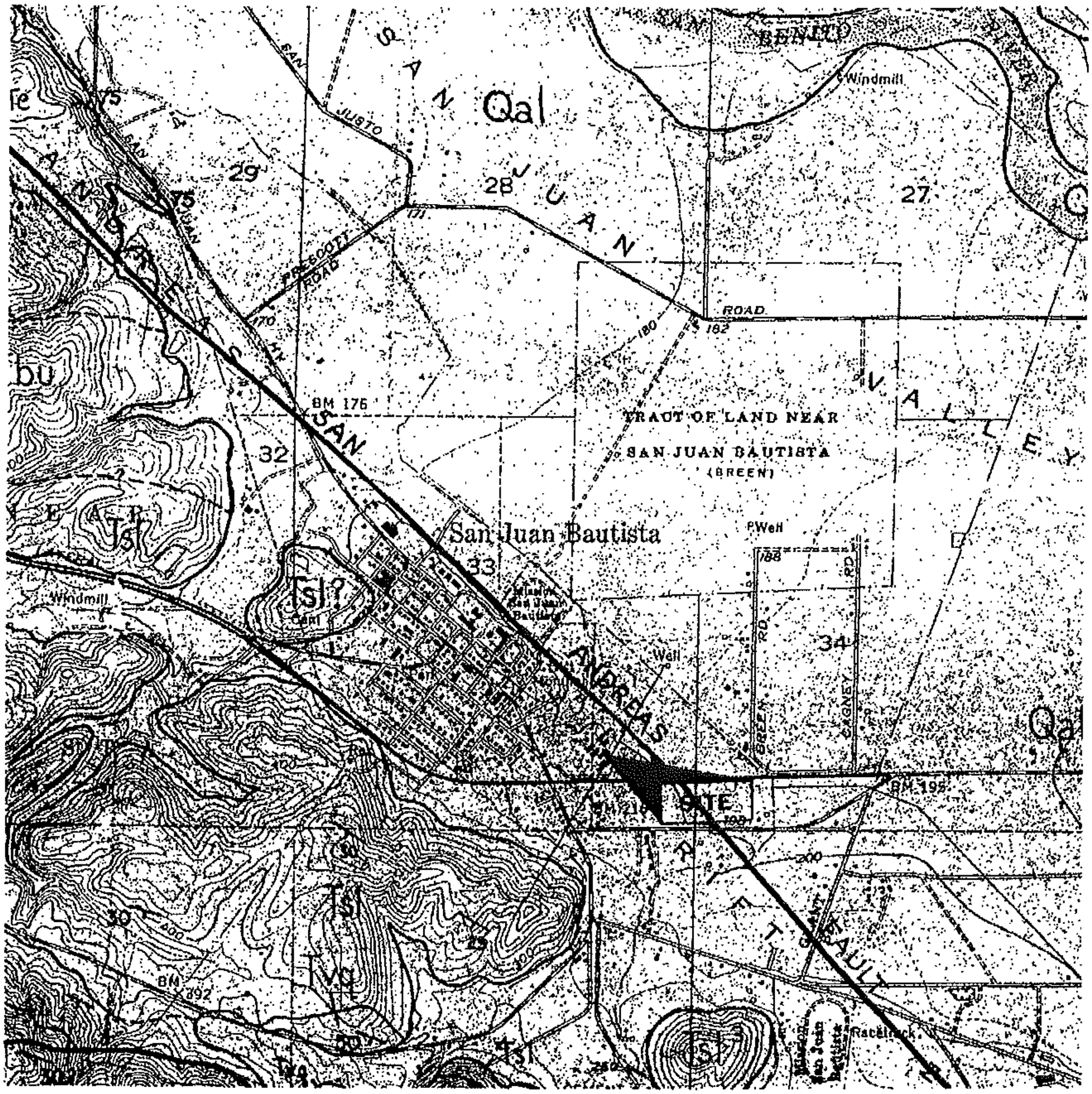
TOPOGRAPHIC SETTING

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE 3
PROJECT 2725



Legend:

Qal = Alluvium.
Tsl = San Lorenzo Formation,
Marine Siltstone and Claystone, Minor Sandstone.

N

SCALE: 1 = 24,000

MAP REFERENCE: Preliminary Geologic Map of the San Juan Bautista Quadrangle, San Benito and Monterey Counties, California by Thomas W. Dibblee, Jr., Tor H. Nilsen, and Earl E. Brabb, 1979 USGS Open File 79-375

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D&M CONSULTING ENGINEERS, INC.
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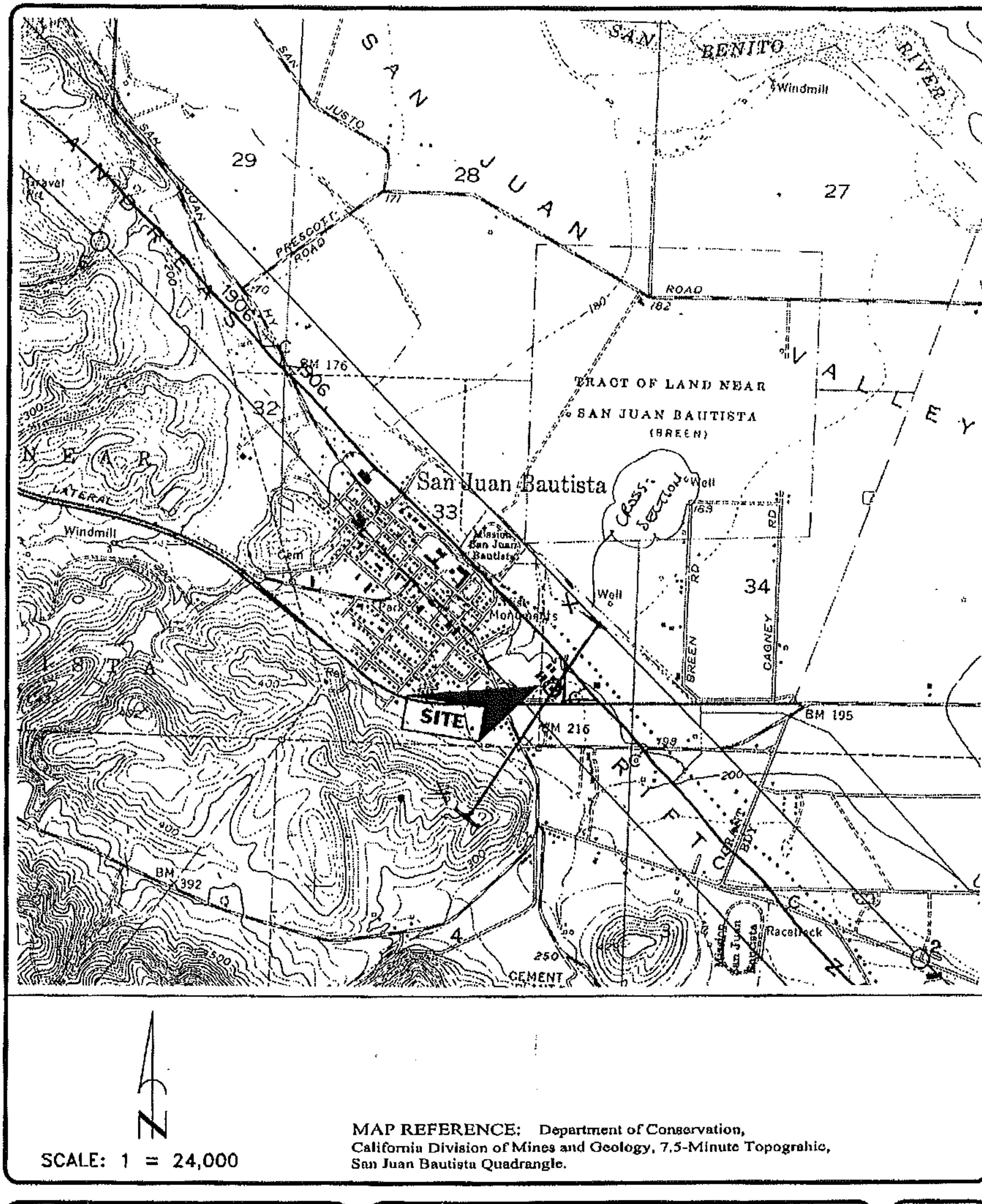
GEOLOGIC MAP
Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
4
PROJECT
2725



SCALE: 1 = 24,000

MAP REFERENCE: Department of Conservation, California Division of Mines and Geology, 7.5-Minute Topograhic, San Juan Bautista Quadrangle.

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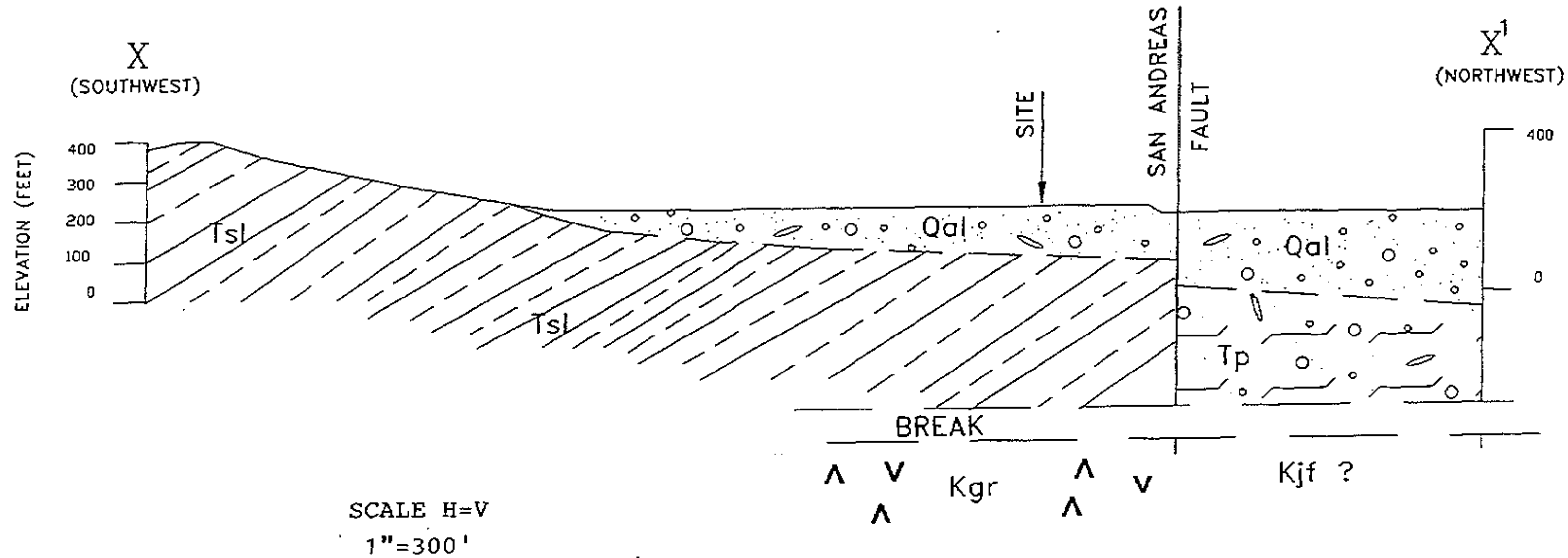
SPECIAL STUDIES ZONES
Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
5
PROJECT
2725



UNITS

Qal — QUATERNARY ALLUVIUM; LARGELY RIVER TERRACE DEPOSIT (PLEISTOCENE ?)

Tp — PURISIMA FORMATION; POORLY CONSOLIDATED SANDS, SILTS, CLAYS AND GRAVELS, MARINE AND NON-MARINE (PLIOCENE)

Tsl — SAN LORENZO FORMATION; MARINE SILTSONE AND CLAYSTONE, MINOR SANDSTONE (OLIGOCENE ?)

Kgr — FRANCISCAN ASSEMBLAGE; GRAYWACKE, SILTSTONE, ALTERED MAFIC VOLCANIC WITH MINOR CHERT, LIMESTONE AND CONGLOMERATE (JURASSIC TO CRETACEOUS)

Kjf — GRANITIC ROCKS; PREDOMINANTLY GRANODIORITE, RANGING FROM GABRO TO GRANITE (CRETACEOUS)

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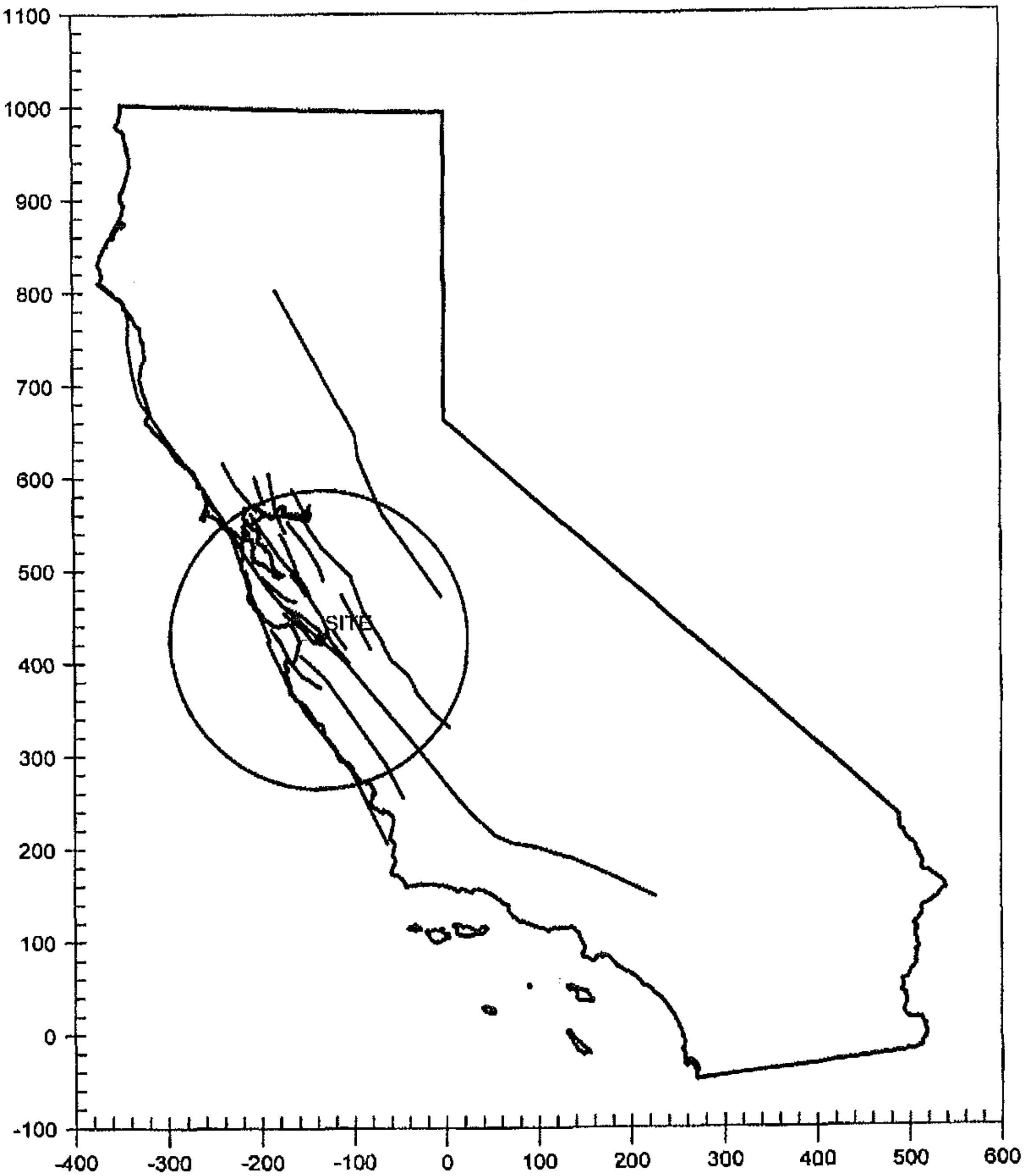
GEOLOGIC CROSS-SECTION
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

FIGURE 6
PROJECT 2725

CALIFORNIA FAULT MAP

San Juan School Kindergarden Addition



SOURCE: Thomas Blake Computer Services, EQSEARCH, April 2000.

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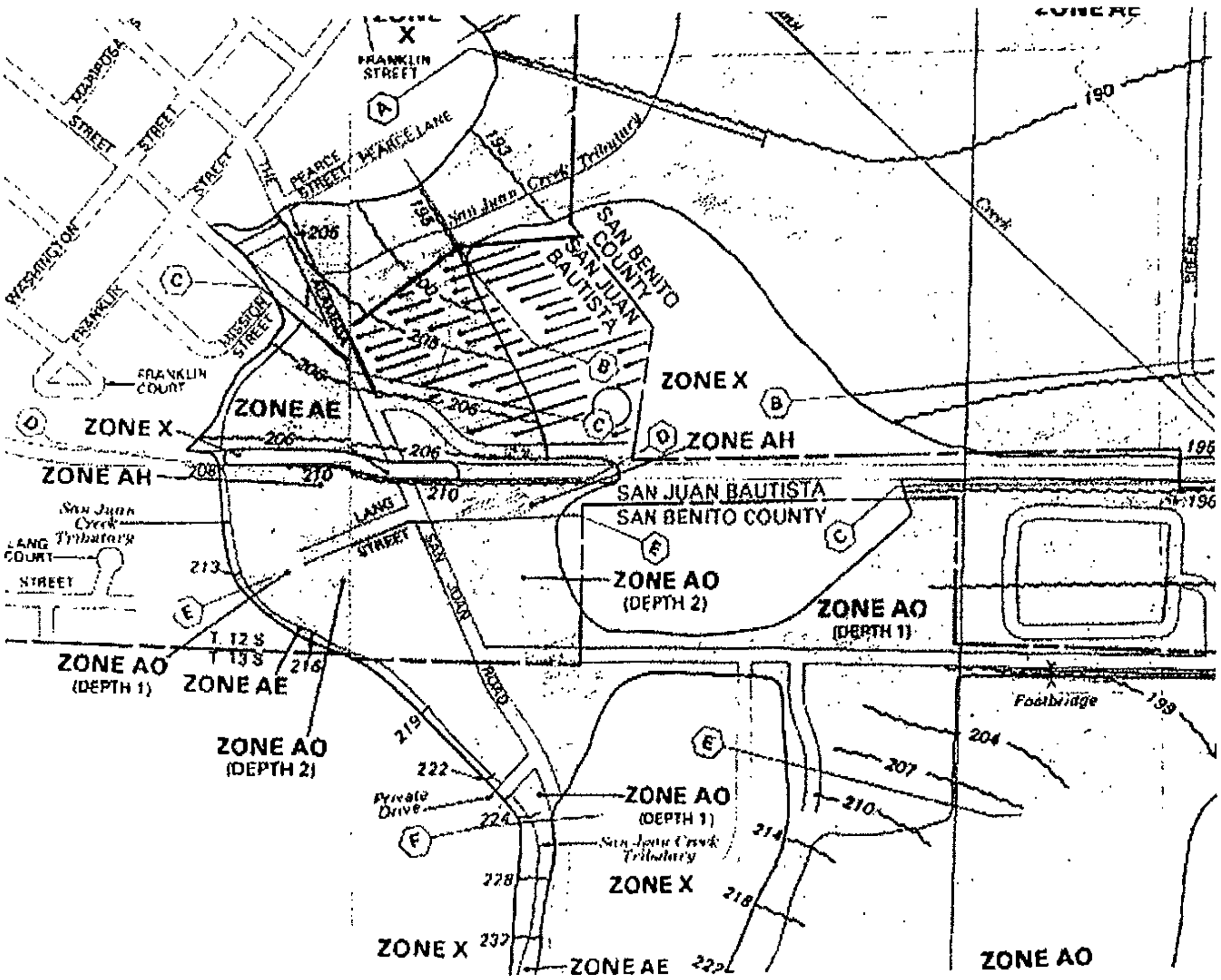
REGIONAL FAULT MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE 7
PROJECT 2725



MAP REFERENCE: FIRM Flood Insurance Rate Map, San Benito County, California and Incorporated Areas, Map Number: 06069C0062 C, Effective Date: September 27, 1991.

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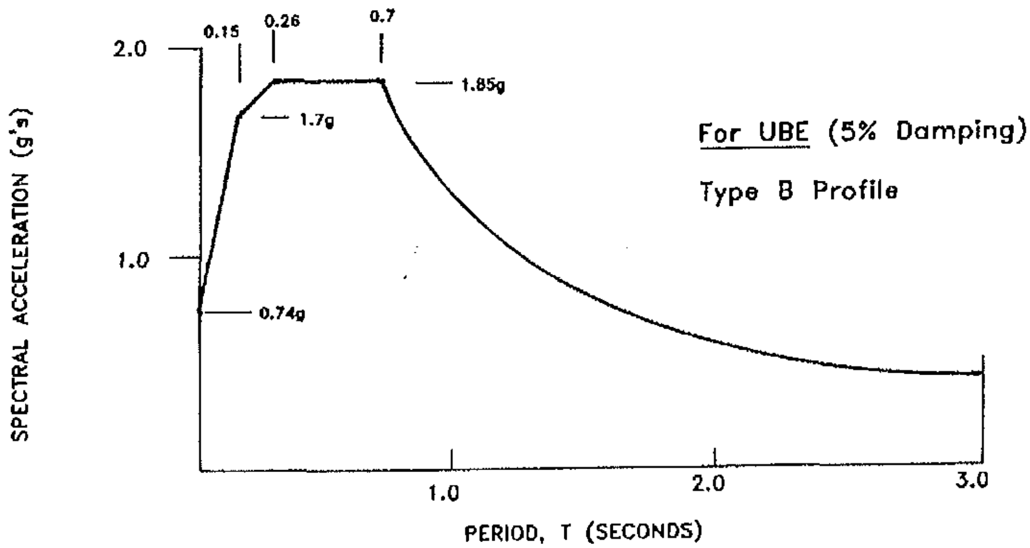
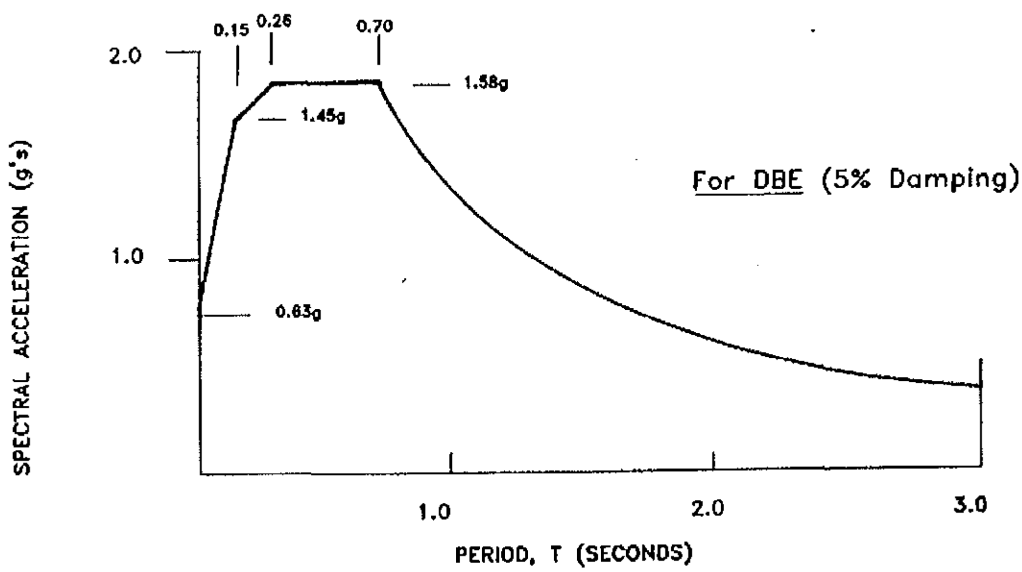
FEMA FLOOD INSURANCE RATE MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
8
PROJECT
2725

Using approach proposed by Seed, R.H. and Others (2001) Response Spectra would be as follows:





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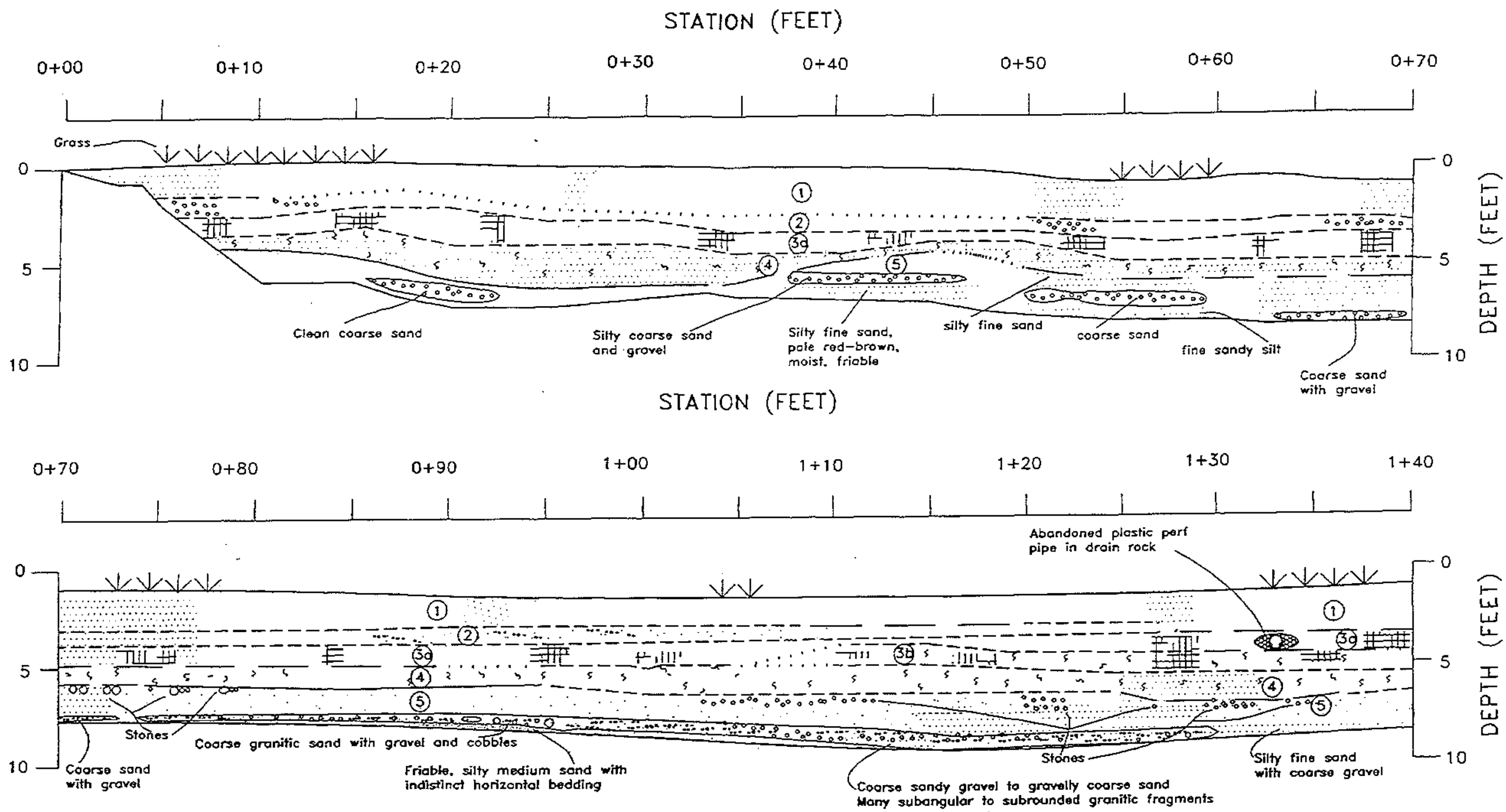
RESPONSE SPECTRA
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

FIGURE 9
PROJECT 2725



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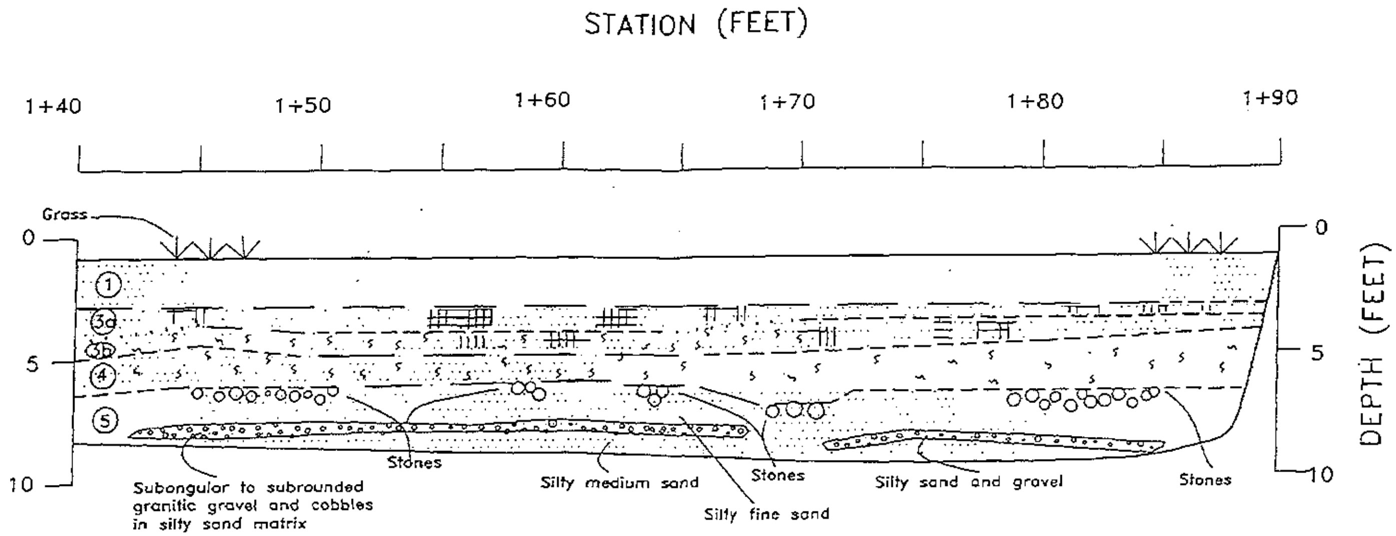
TRENCH LOG
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

PLATE 1a
PROJECT 2725



EARTH MATERIALS

(1) Silt with coarse sand (ML): Medium brown, dry, loose, contains angular white to light gray medium to coarse granitic sand and fine gravel, many voids and fine roots, weak granular structure, upper 6"–10" disturbed by plowing [A Horizon]

(2) Medium to coarse sandy silt (ML): Pale orange brown with light gray granitic sand, dry, medium dense, few voids [B Horizon]

(3a) Medium to coarse sandy clayey silt (CL–ML): Pale orange brown with light gray granitic sand and dark brown clay–skin coating on ped faces producing dull sheen, dry, weak block to prismatic structure [B Horizon]

(3b) Sandy clayey silt (CL–ML): Pale orange brown with light gray granitic sand, and dark brown clay–skin coating on ped faces, weak blocky to prismatic structure, white carbanate filiments (stage 1) [Btk Horizon]

(4) Fine sandy silt (ML): Pale orange brown, damp, medium dense to dense, few to pervasive buff carbonate filiments, veins and discontinuous coating on ped faces (Stage 1 carbonate morphology) [Bk Horizon]

(5) Alluvium (Qal): Predominantly silty granitic sand with gravel with near–horizontal interbeds of fine to coarse sand, gravel and same granitic cobble–size clasts, pale orange brown, moist to wet, dense, locally friable, clasts sub–angular to sub–rounded, interbed laterally discontinuous

CONTACTS	
————	ABRUPT, <1"
— —	CLEAR, <3"
– – – – –	GRADUAL, <6"
· · · · · · · ·	DIFFUSE, >6"

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TRENCH LOG
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

PLATE 1b
PROJECT 2725

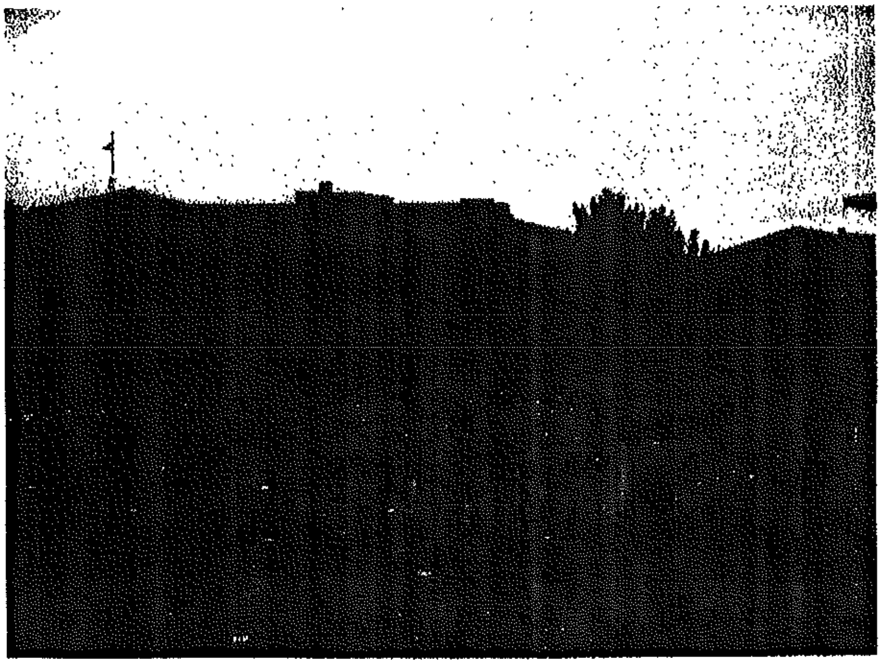

Photo 1: Building Addition Site. Southeast wall of existing building shown.

Photo 2: Descending scarp and marshy area along San Andreas fault trace.

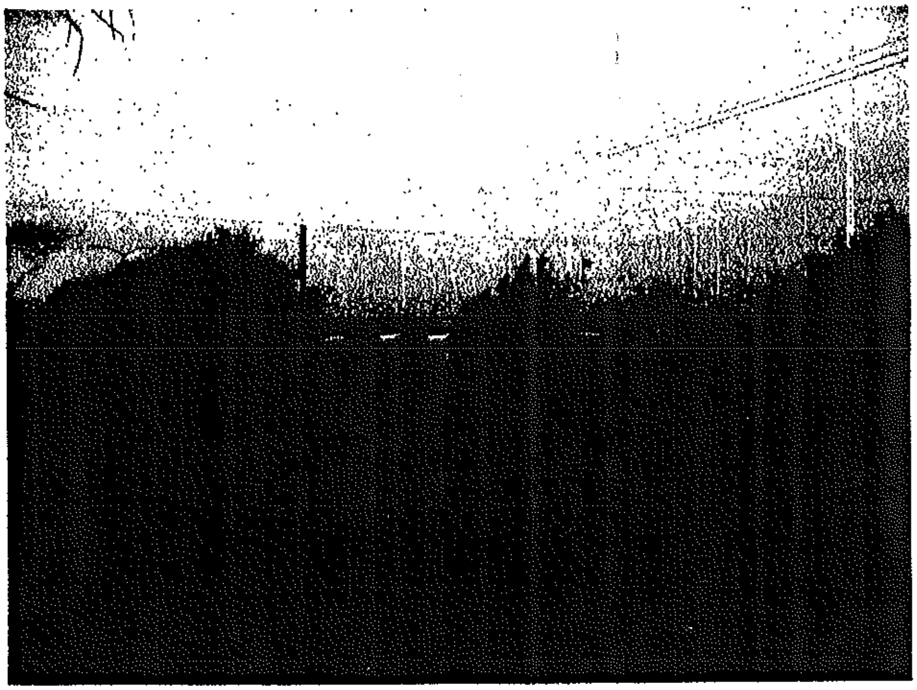

Photo 3: Private land where fault trench was excavated. Existing kindergarten building beyond.

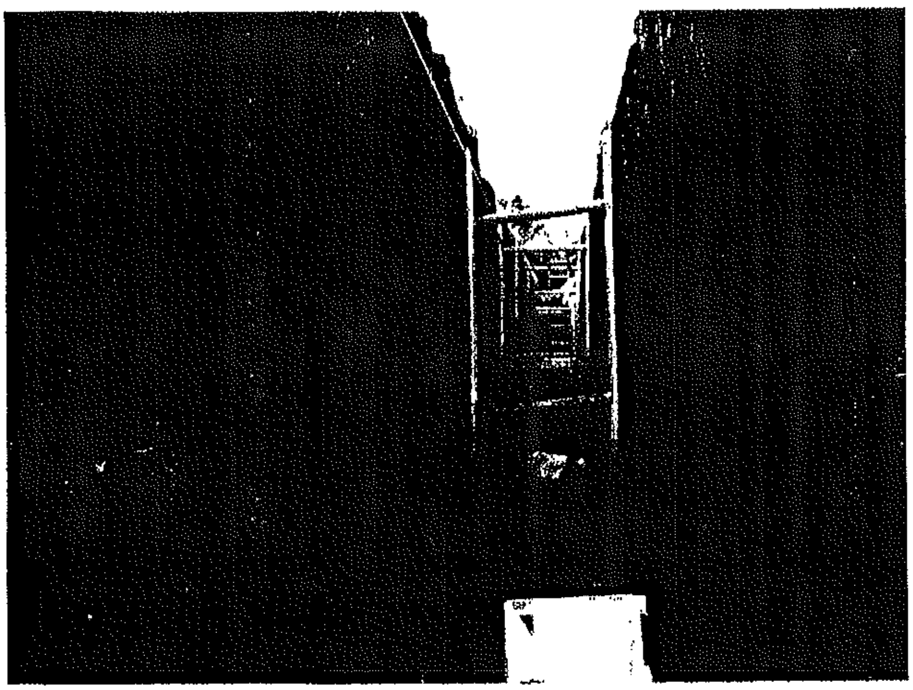

Photo 4: Fault trench looking northeast. Flags on left (northwest) wall showing level of stones. Continuous soil horizons flagged on opposite wall.

KEY TO EXPLORATORY BORING LOGS

PRIMARY DIVISIONS			GROUP1 SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size	GRAVELS More than half coarse fraction is larger than No.4 sieve	Clean Gravels (less than 5% fines*)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravel with fines*	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS More than half coarse fraction is smaller than No.4 sieve	Clean Sands (less than 5% fines*)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		Sands with fines*	SM	Silty sands, silt-sand mixtures, non-plastic fines
			SC	Clayey sand, sand-clay mixtures, plastic fines
FINE GRAINED SOILS More than half of material is smaller than No. 200 sieve size	SILTS AND CLAYS Liquid limit is less than 50		ML	Inorganic silts, clayey silts, rock flour, silty very fine sands
			CL	Inorganic clays of low plasticity, gravelly clay of low plasticity
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit is greater than 50		MH	Inorganic silts, clayey silts, elastic silts, micaceous or diatomaceous silty or fine sandy soil
			CH	Inorganic clays of high plasticity
			OH	Organic clays and silts of high plasticity
HIGHLY ORGANIC SOILS			Pt	Peat, meadow mat, highly organic soils

GRAIN SIZES

U.S. STANDARD SERIES SIEVE	200	40	10	4	CLEAR SQUARE SIEVE OPENINGS ¾"	3"	12"
Silts and Clays	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT*
VERY LOOSE	0 – 4
LOOSE	4 – 10
MEDIUM DENSE	10 – 30
DENSE	30 – 50
VERY DENSE	OVER 50

CONSISTENCY

CLAYS AND PLASTIC SILTS	STRENGTH**	BLOWS/FOOT*
VERY SOFT	0 – ¼	0 – 2
SOFT	¼ – ½	2 – 4
FIRM	½ – 1	4 – 8
STIFF	1 – 2	8 – 16
VERY STIFF	2 – 4	16 – 32
HARD	OVER 4	OVER 32

SYMBOLS

▽	Initial Ground Water Level
▼	Final Ground Water Level
T	Standard Penetration Sampler (Teizaghi) – 2 inch O.D. (1 3/8 inch I.D.) split spoon sampler (ASTM D1586-84).
C	California Sampler – 3" O.D. (2 1/2 inch I.D.) sampler
ST	Shelby/Pitcher Tube Sampler – 3 ½ inch O.D. (3 inch I.D.) CME brand split spoon sampler (5 foot long); advances with augers and provides a 3 foot long continuous core.

NOTES

*BLOWS per FOOT – Resistance to the advancement of the soil sampler-number of blows of a 140-pound hammer falling 30 inches to drive a split spoon sampler.

**Unconfined compression strength in tons/sq.ft. as estimated by SPT Resistance, field and laboratory tests, and/or visual observation.

Stratification lines on the logs represent the approximate boundary between soil types, and the transition may be gradual.

BORING LOG

No. B - 1

PROJECT: San Juan Elementary Kindergarten Building Addition	DATE: 10/31/2002	LOGGED BY: BB	
DRILL RIG: Mobile B-56	HOLE DIA.: 8"	SAMPLER: T=SPT, C=California (2.5" O.D.)	
GROUND WATER DEPTH INITIAL: 28'	FINAL: N/A	HOLE ELEVATION: NM	

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY LIMIT	MINUS #200 (%)	Unconfined Compression Test (ksf)
3" Asphalt and 9" Baserock		1										
SANDY CLAY with gravel; black to dark brown, moist to very moist, very stiff.	CL	2										
		3	T	17								
SANDY CLAY with gravel; light brown, moist, very stiff to hard.	CL	4										
		5	C	46			19	117	37	11	79	
		6										
		7	C	50								
SILTY SAND; brown to light brown, moist, dense, fine to coarse grain, some fine gravel.	SM	8										
		9										
		10										
		11										
D_{60} = 0.85 mm		12	T	30							18	
		13										
		14										
		15										
		16										
		17	T	35								
		18										
SILTY SAND/SANDY CLAY; light brown, very moist to wet, medium dense, fine to medium grain.	SM/CL	19										
		20										

BORING LOG

No. B - 1

PROJECT: San Juan Elementary Kindergarten Building Addition DATE: 10/31/2002 LOGGED BY: BB

DRILL RIG: Mobile B-56 HOLE DIA.: 8" SAMPLER: T=SPT, C=California (2.5" O.D.)

GROUND WATER DEPTH INITIAL: 28' FINAL: N/A HOLE ELEVATION: NM

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY LIMIT	MINUS #200 (%)	Unconfined Compression Test (ksf)
SILTY SAND/SANDY CLAY; (continued)	SM/ CL	21										
SANDY CLAY with gravel; light gray to olive, very moist, stiff.	CL		T	9							48	
		22										
		23										
		24										
		25										
light brown to olive-brown.		26										
			T	14								
		27										
		28										
		29										
		30										
WELL GRADED SAND-CLAYEY SAND; light brown, wet, dense, coarse grain.	SW- SC	31										
D_{50} = 1.5 mm			T	47							10	
		32										
		33										
CLAYEY SAND with gravel; light brown, moist, brown, wet, dense to very dense, fine to medium grain.	SC	34										
		35										
		36										
D_{50} = 0.3 mm			T	51							35	
		37										
		38										
		39										
		40										

BORING LOG

No. B - 1

PROJECT:	San Juan Elementary Kindergarten Building Addition		DATE:	10/31/2002	LOGGED BY: BB
DRILL RIG:	Mobile B-56	HOLE DIA.: 8"	SAMPLER:	T=SPT, C=California (2.5" O.D.)	
GROUND WATER DEPTH INITIAL:	28'	FINAL: N/A		HOLE ELEVATION:	NM

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY LIMIT	MINUS #200 (%)	Unconfined Compression Test (ksf)
CLAYEY SAND with gravel; (continued)	SC											
		41	T	61								
Bottom of boring @ 41.5'.		42										
Drill hole backfilled with cutting and capped with asphalt.		43										
		44										
		45										
		46										
		47										
		48										
		49										
		50										
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		53										
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		58										
		59										
		60										

APPENDIX C

TESTa

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*                       *
*   E Q S E A R C H     *
*                       *
*    Version 3.00       *
*                       *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 2725

JOB NAME: Aromas-San Juan School District

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 5.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 36.8410
SITE LONGITUDE: 121.5300

SEARCH DATES:
START DATE: 1800
END DATE: 2002

SEARCH RADIUS:
62.4 mi
100.4 km

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: 0 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

TESTa

EARTHQUAKE SEARCH RESULTS

Page 1

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
T-A	36.8300	121.5700	10/18/1800	0 0 0.0	0.0	7.00	0.627	X	2.3(3.8)
DMG	36.8000	121.5000	11/13/1892	1245 0.0	0.0	5.60	0.346	IX	3.3(5.3)
DMG	36.8000	121.4500	06/24/1939	13 2 0.0	0.0	5.50	0.236	IX	5.2(8.4)
DMG	36.9100	121.4800	11/28/1974	23 124.7	0.0	5.20	0.174	VIII	5.5(8.9)
DMG	36.9000	121.6000	04/24/1890	1136 0.0	0.0	6.00	0.333	IX	5.6(9.0)
DMG	36.9000	121.6000	03/30/1883	1545 0.0	0.0	5.60	0.243	IX	5.6(9.0)
MGI	36.9000	121.6000	10/11/1800	0 0 0.0	0.0	5.70	0.264	IX	5.6(9.0)
DMG	36.8700	121.6300	09/14/1963	194617.0	0.0	5.40	0.197	VIII	5.9(9.4)
DMG	36.8300	121.4200	12/31/1910	1211 0.0	0.0	5.00	0.133	VIII	6.1(9.9)
DMG	36.7800	121.4300	01/20/1960	32553.0	0.0	5.00	0.119	VII	6.9(11.2)
GSB	36.7550	121.4640	08/12/1998	141025.1	8.0	5.40	0.168	VIII	7.0(11.2)
DMG	36.8000	121.4000	04/02/1885	1525 0.0	0.0	5.40	0.152	VIII	7.7(12.4)
GSB	36.9180	121.6700	04/18/1990	134138.8	6.0	5.00	0.087	VII	9.4(15.1)
GSB	36.9170	121.6750	04/18/1990	135351.4	5.0	5.40	0.120	VII	9.6(15.4)
DMG	36.9000	121.7000	04/30/1899	2241 0.0	0.0	5.60	0.131	VIII	10.2(16.5)
DMG	36.9300	121.6800	04/25/1954	203328.0	0.0	5.30	0.101	VII	10.3(16.6)
DMG	36.9800	121.6000	03/02/1959	232717.0	30.0	5.30	0.101	VII	10.3(16.6)
GSB	36.9320	121.6950	04/18/1990	154603.7	9.0	5.20	0.085	VII	11.1(17.8)
DMG	37.0000	121.5000	06/20/1897	2014 0.0	0.0	6.20	0.188	VIII	11.1(17.9)
T-A	37.0000	121.5700	03/25/1859	0 0 0.0	0.0	5.00	0.071	VI	11.2(18.0)
MGI	37.0000	121.5700	01/09/1928	250 0.0	0.0	5.30	0.092	VII	11.2(18.0)
DMG	37.0200	121.4800	03/09/1949	122839.0	0.0	5.20	0.072	VII	12.7(20.4)
GSB	36.8030	121.3020	02/20/1988	083957.5	9.0	5.30	0.077	VII	12.9(20.7)
GSB	37.0250	121.4580	01/16/1993	062934.9	5.0	5.30	0.074	VII	13.3(21.4)
GSB	36.8100	121.2750	01/26/1986	192051.2	7.0	5.50	0.080	VII	14.3(22.9)
DMG	36.9000	121.8000	03/11/1910	652 0.0	0.0	5.50	0.072	VI	15.5(24.9)
DMG	36.7000	121.3000	03/31/1885	756 0.0	0.0	5.50	0.068	VI	16.0(25.8)
DMG	36.7000	121.3000	04/09/1961	72541.0	0.0	5.50	0.068	VI	16.0(25.8)
DMG	36.6800	121.3000	04/09/1961	72316.0	0.0	5.60	0.069	VI	16.9(27.2)
DMG	37.0600	121.6900	11/16/1964	24641.7	0.0	5.00	0.040	V	17.5(28.2)
DMG	37.0000	121.7800	12/18/1967	172432.0	0.0	5.30	0.051	VI	17.6(28.4)
BRK	37.1000	121.5000	08/06/1979	17 522.0	0.0	5.80	0.075	VII	18.0(28.9)
DMG	37.1000	121.6000	03/26/1866	2012 0.0	0.0	5.40	0.053	VI	18.3(29.4)
DMG	36.9000	121.2000	03/06/1882	2145 0.0	0.0	5.70	0.066	VI	18.7(30.0)
T-A	36.6700	121.2500	04/01/1857	1135 0.0	0.0	5.00	0.035	V	19.5(31.3)
DMG	36.6700	121.2500	08/06/1916	1938 0.0	0.0	5.50	0.053	VI	19.5(31.3)
DMG	37.1000	121.7000	02/26/1864	1347 0.0	0.0	5.90	0.069	VI	20.2(32.5)
DMG	37.1000	121.8000	05/24/1865	1121 0.0	0.0	5.50	0.041	V	23.3(37.4)
GSB	37.0780	121.8320	10/25/1989	012726.6	14.0	5.00	0.027	V	23.3(37.6)
GSB	37.0360	121.8830	10/18/1989	000415.2	18.5	7.00	0.128	VIII	23.7(38.1)
GSB	36.6030	121.2010	04/23/1995	084136.6	7.0	5.00	0.026	V	24.5(39.5)
DMG	37.2000	121.5000	07/06/1899	2010 0.0	0.0	5.80	0.048	VI	24.8(40.0)
DMG	36.5780	121.2090	02/24/1972	155651.0	7.5	5.10	0.026	V	25.4(40.9)

DMG	36.5800	121.1800	07/29/1951	105345.0	0.0	5.00	0.023	IV	26.5(42.6)
GSB	37.1300	121.8780	06/27/1988	184322.3	13.0	5.70	0.038	V	27.7(44.5)
T-A	37.0000	122.0000	06/30/1890	2030 0.0	0.0	5.00	0.021	IV	28.2(45.3)
GSB	37.1300	121.9520	08/08/1989	081327.5	15.0	5.30	0.024	IV	30.7(49.3)
DMG	37.2500	121.7500	07/01/1911	22 0 0.0	0.0	6.60	0.067	VI	30.7(49.4)
MGI	36.6000	122.0000	07/03/1841	22 7 0.0	0.0	5.00	0.019	IV	30.9(49.7)
DMG	36.4500	121.2500	09/27/1938	1223 0.0	0.0	5.00	0.018	IV	31.1(50.1)
GSB	37.3200	121.6980	04/24/1984	211519.0	8.0	6.20	0.042	VI	34.3(55.3)
DMG	37.1700	122.0000	11/09/1914	231 0.0	0.0	5.50	0.024	IV	34.5(55.5)
DMG	37.3000	121.8000	08/03/1903	649 0.0	0.0	5.50	0.023	IV	35.0(56.3)

EARTHQUAKE SEARCH RESULTS

Page 2

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	37.3000	121.8000	01/02/1891	20 0 0.0	0.0	5.50	0.023	IV	35.0(56.3)
MGI	37.3000	121.9000	05/28/1927	1739 0.0	0.0	5.00	0.014	IV	37.7(60.6)
DMG	37.3000	121.9000	10/08/1865	2046 0.0	0.0	6.30	0.040	V	37.7(60.6)
GSB	36.3730	121.9070	01/23/1984	054019.7	7.0	5.40	0.019	IV	38.5(61.9)
DMG	37.0200	122.2000	10/24/1926	225149.5	0.0	5.50	0.020	IV	39.0(62.7)
DMG	37.3700	121.7800	09/05/1955	2 118.0	0.0	5.50	0.020	IV	39.0(62.8)
GSB	36.3630	121.9100	01/23/1984	065950.4	5.0	5.00	0.013	III	39.1(63.0)
DMG	37.4000	121.4000	04/10/1881	10 0 0.0	0.0	5.90	0.027	V	39.2(63.2)
GSB	37.3850	121.7720	06/13/1988	014536.8	7.0	5.40	0.018	IV	39.8(64.1)
DMG	37.2000	122.1000	02/17/1870	2012 0.0	0.0	5.80	0.025	V	40.0(64.4)
DMG	36.5700	122.1700	10/22/1926	133522.0	0.0	6.10	0.031	V	40.1(64.5)
GSB	37.1980	122.1050	10/18/1989	004124.7	19.0	5.10	0.014	IV	40.1(64.6)
DMG	36.9500	122.2600	02/15/1927	2354 3.5	0.0	5.00	0.012	III	41.0(66.0)
DMG	37.1000	122.2000	03/26/1884	040 0.0	0.0	5.90	0.026	V	41.1(66.1)
DMG	36.4000	121.0000	04/12/1885	4 5 0.0	0.0	6.20	0.031	V	42.3(68.1)
DMG	36.6000	120.8000	07/25/1926	175749.0	15.0	5.00	0.011	III	43.7(70.3)
GSB	37.4830	121.6900	03/31/1986	115540.0	8.0	5.70	0.019	IV	45.2(72.7)
DMG	37.5000	121.3000	07/15/1866	630 0.0	0.0	5.80	0.019	IV	47.2(76.0)
DMG	36.6100	122.3500	10/22/1926	1235 7.0	0.0	6.10	0.024	V	48.1(77.4)
DMG	37.5000	121.9000	11/26/1858	835 0.0	0.0	6.10	0.023	IV	49.8(80.2)
DMG	37.6000	121.8000	06/11/1903	1312 0.0	0.0	5.50	0.012	III	54.5(87.6)
DMG	37.6000	122.1000	05/21/1864	2 1 0.0	0.0	5.30	0.009	III	61.1(98.3)
DMG	37.5000	122.3000	02/15/1856	1325 0.0	0.0	5.50	0.010	III	62.2(100.0)

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-END OF SEARCH- 76 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2002

LENGTH OF SEARCH TIME: 203 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 2.3 MILES (3.8 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.0

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.627 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
  a-value= 1.307

b-value= 0.392
beta-value= 0.902

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	76	0.37438
4.5	76	0.37438
5.0	76	0.37438
5.5	40	0.19704
6.0	11	0.05419
6.5	3	0.01478
7.0	2	0.00985

TESTb

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*                       *
*    E Q S E A R C H    *
*                       *
*     Version 3.00      *
*                       *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 2725

JOB NAME: Aromas-San Juan School District

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 6.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 36.8410
SITE LONGITUDE: 121.5300

SEARCH DATES:
START DATE: 1800
END DATE: 2002

SEARCH RADIUS:
100.0 mi
160.9 km

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: 0 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

EARTHQUAKE SEARCH RESULTS

Page 1

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
T-A	36.8300	121.5700	10/18/1800	0 0 0.0	0.0	7.00	0.627	X	2.3(3.8)
DMG	36.9000	121.6000	04/24/1890	1136 0.0	0.0	6.00	0.333	IX	5.6(9.0)
DMG	37.0000	121.5000	06/20/1897	2014 0.0	0.0	6.20	0.188	VIII	11.1(17.9)
GSB	37.0360	121.8830	10/18/1989	000415.2	18.5	7.00	0.128	VIII	23.7(38.1)
DMG	37.2500	121.7500	07/01/1911	22 0 0.0	0.0	6.60	0.067	VI	30.7(49.4)
GSB	37.3200	121.6980	04/24/1984	211519.0	8.0	6.20	0.042	VI	34.3(55.3)
DMG	37.3000	121.9000	10/08/1865	2046 0.0	0.0	6.30	0.040	V	37.7(60.6)
DMG	36.5700	122.1700	10/22/1926	133522.0	0.0	6.10	0.031	V	40.1(64.5)
DMG	36.4000	121.0000	04/12/1885	4 5 0.0	0.0	6.20	0.031	V	42.3(68.1)
DMG	36.6100	122.3500	10/22/1926	1235 7.0	0.0	6.10	0.024	V	48.1(77.4)
DMG	37.5000	121.9000	11/26/1858	835 0.0	0.0	6.10	0.023	IV	49.8(80.2)
DMG	37.7000	122.1000	10/21/1868	1553 0.0	0.0	6.80	0.026	V	67.1(107.9)
DMG	37.6000	122.4000	06/01/1838	0 0 0.0	0.0	7.00	0.028	V	70.9(114.2)
DMG	37.8000	122.2000	06/10/1836	1530 0.0	0.0	6.80	0.022	IV	75.7(121.9)
BRK	36.2200	120.4000	07/22/1983	23955.0	0.0	6.00	0.012	III	75.9(122.2)
DMG	35.7300	121.2000	11/22/1952	74637.0	0.0	6.00	0.011	III	78.9(126.9)
DMG	37.7000	122.5000	04/18/1906	131221.0	0.0	8.25	0.064	VI	79.7(128.3)
BRK	36.2200	120.2900	05/02/1983	234239.0	0.0	6.70	0.018	IV	81.1(130.4)
DMG	38.0000	121.9000	05/19/1889	1110 0.0	0.0	6.00	0.010	III	82.6(132.8)
MGI	37.8000	122.5000	06/21/1808	0 0 0.0	0.0	6.30	0.013	III	85.0(136.7)
DMG	35.8000	120.3300	06/08/1934	447 0.0	0.0	6.00	0.008	III	98.1(157.9)

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-END OF SEARCH- 21 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2002

LENGTH OF SEARCH TIME: 203 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 2.3 MILES (3.8 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 8.3

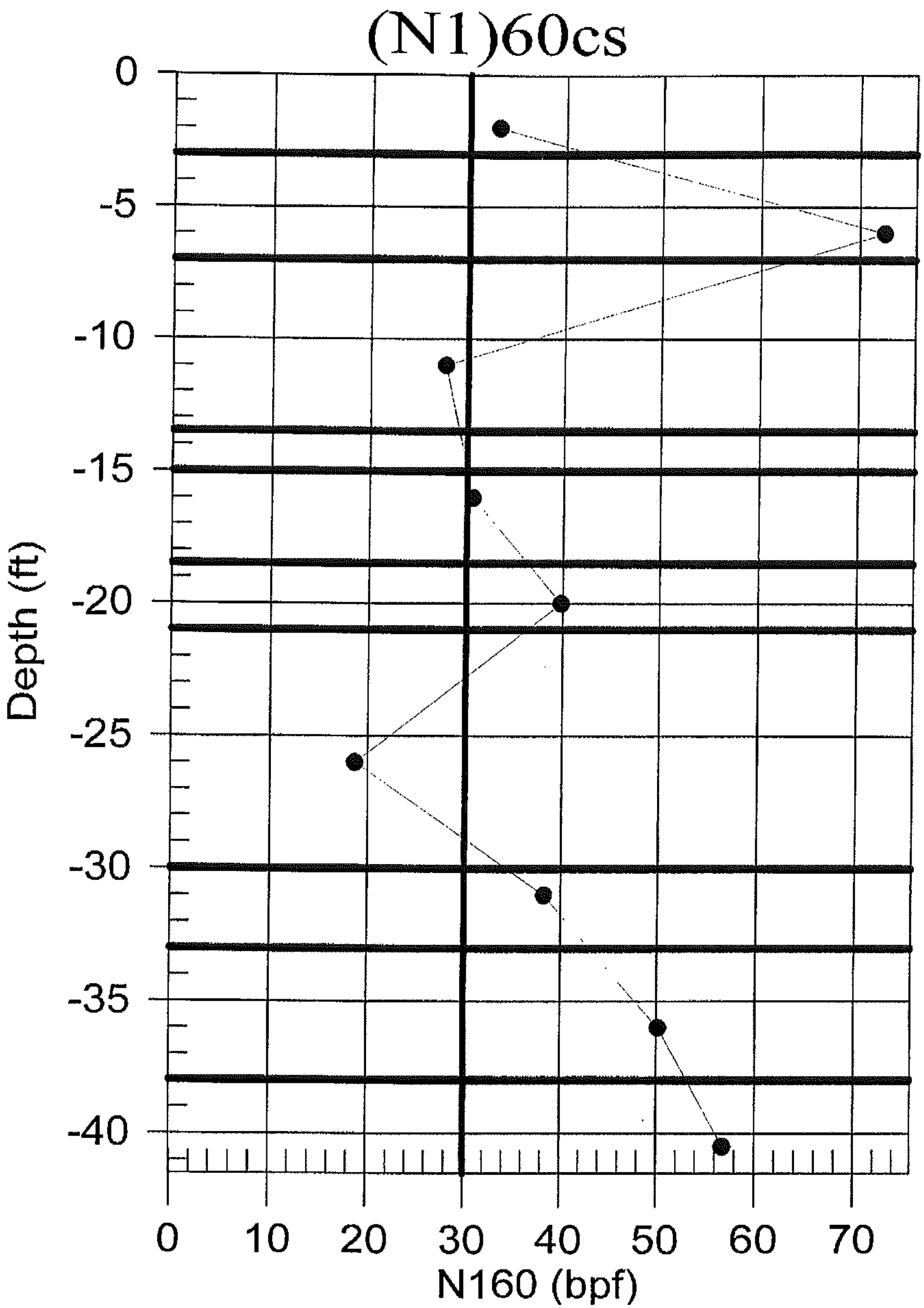
LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.627 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
-a-value= 0.985
b-value= 0.000
beta-value= 0.000

TABLE OF MAGNITUDES AND EXCEEDANCES:

TESTb

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	21	0.10345
4.5	21	0.10345
5.0	21	0.10345
5.5	21	0.10345
6.0	21	0.10345
6.5	8	0.03941
7.0	4	0.01970
7.5	1	0.00493
8.0	1	0.00493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Depth (ft)
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-25
-30
-35
-40
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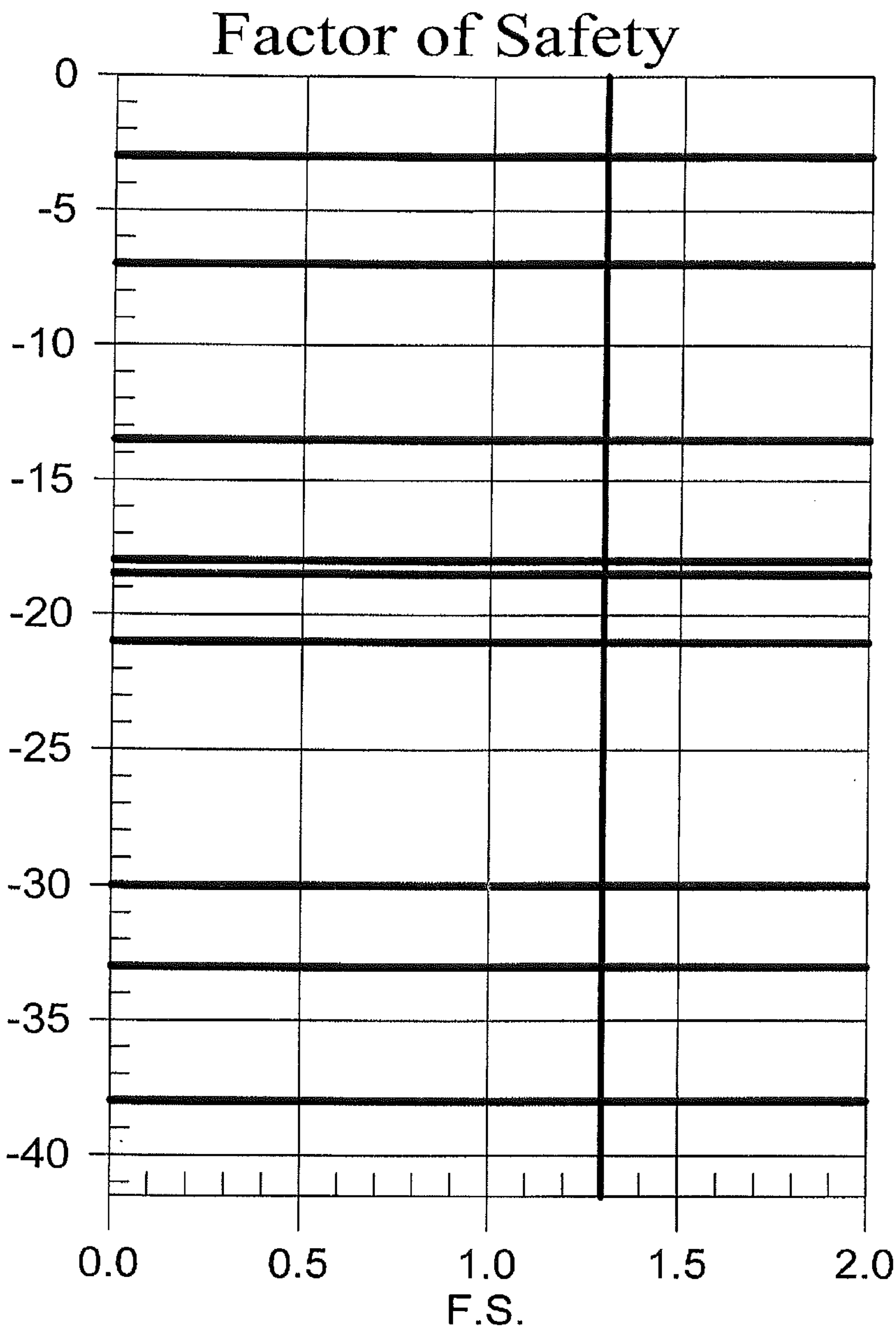
10
20
30
40
50
60
70
N160 (bpf)


Factor of Safety
0
-5
-10
-15
-20
-25
-30
-35
-40
0.0
0.5
1.0
1.5
2.0
F.S.

CLEARY CONSULTANTS, INC.

Geotechnical Engineers and Geologists

April 30, 1987
Project No. 479.1
Ser. 3064

Mr. David N. Evans, District Superintendent
San Juan Union School District
100 Nyland Drive
San Juan Bautista, California 95045

RE: FAULT LOCATION INVESTIGATION
SAN JUAN JUNIOR HIGH SCHOOL ADDITIONS
SAN JUAN BAUTISTA, CALIFORNIA

Dear Mr. Evans:

As authorized by you, we have performed a fault location investigation for the planned San Juan Junior High School additions in San Juan Bautista, California. The accompanying report presents results of our field investigation and geological analysis. The geologic conditions are discussed and appropriate conclusions and recommendations are presented.

Please refer to the text of this report for a detailed discussion of our findings. If you have any questions concerning this report, please call.

Yours very truly,

CLEARY CONSULTANTS, INC.

Michael K. Shimamoto
Geologist 4214

J. Michael Cleary
Civil Engineer 21014
Geologist 918
Engineering Geologist 352

MKS/JMC:pc
Copies: Addressee (2)
Porter-Jensen-Hansen-Manzagol, Architects (3)

900 N. SAN ANTONIO ROAD, LOS ALTOS, CALIFORNIA 94022 (415) 948-0574

INTRODUCTION

This report presents the results of our fault location investigation for the proposed San Juan Junior High School addition and emergency relocatable classroom buildings to be located on the San Juan Union School District property located on the east side of The Alameda between Pearce Lane and Nyland Drive in San Juan Bautista, California. The general location of the site is shown on Drawing 1, Site Location and Special Studies Zone Map. The property is situated within the State of California Special Studies Zone for the San Andreas fault.

As shown on Drawing 1, the trace of the active San Andreas fault has been mapped immediately east of the school district property. The purpose of this investigation, therefore, was to evaluate the possible hazard of fault offset through the site in compliance with the regulations of the Alquist-Priolo Special Studies Zones Act.

SCOPE

The scope of services performed in this investigation included a review of published and unpublished geologic information for the area, several geologic reconnaissances of the site and surrounding areas to map surficial geologic features, a review of stereoscopic aerial photographs of the site and vicinity, geophysical exploration consisting of magnetometer traverses across the property and suspected fault trace, subsurface fault trenching, geologic analysis of the field data and preparation of this report.

This report has been prepared for the exclusive use of the San Juan Union School District and its consultants in accordance with generally accepted engineering geology principles and practices. No other warranty, expressed or implied, is made.

METHOD OF INVESTIGATION

A review of published and unpublished geologic literature of the site vicinity was initially conducted to determine the regional geologic conditions of the area. This literature is listed in the Bibliography at the end of the text. At this time, stereoscopic aerial photographs of the site and surrounding area were examined for evidence of faulting and other geologic hazards. These photographs are also listed in the Bibliography.

Our engineering geologists conducted several reconnaissances of the property and adjoining areas during April 1987 to observe and map surface geologic features. The results of the mappings are shown on Drawing 3, Site Plan and Geologic Map.

A total of two magnetometer traverses using a Geometrics Unimag Model G-836 Portable Proton Magnetometer were performed across the site and adjacent property to the east. The traverses were oriented at right angles to the San Andreas fault and magnetic intensity readings were taken at 10 foot intervals. The locations of the magnetometer survey lines are shown on Drawing 3 and the results of the survey are presented on Drawing 7.

During the period of April 13 through 16, 1987, two fault exploration trenches totaling 770 feet in length were excavated at the locations shown on Drawing 3. The trench width was 24 inches and the depth ranged from about five feet to eleven feet. The logs of the trenches are presented on Drawings 4, 5 and 6.

The attached trench logs, magnetometer data, site geologic data and related information depict subsurface conditions only at the specific locations shown on Drawing 3 and on the particular date designated on the logs. Also, the passage of time may result in changes in the subsurface conditions due to environmental changes. The locations of the magnetometer traverses and trenches were approximately determined by pacing or taping from existing topographic features and should be considered accurate only to the degree implied by the method used. The exploration trenches were loosely backfilled and wheel-rolled after the logging was completed.

GEOLOGIC SETTING

A. Regional Geology

The site is located at the western edge of San Juan Valley, a northwest trending depression in the California Coast Ranges Geomorphic Province. The valley in the site vicinity is bound on the west by the foothills of the northern Gabilan Range and the San Andreas fault.

As shown on Drawing 2, Regional Geologic Map, the San Juan Bautista area is underlain principally by unconsolidated Holocene Age alluvium filling the San Juan Valley. The foothills area west of the site is underlain by Tertiary Age marine and non-marine sedimentary strata of the San Lorenzo Formation, Vaqueros Sandstone and Zayante Sandstone of Dibblee, 1979.

B. San Andreas Fault (Previous Regional Studies)

The San Andreas fault at San Juan Bautista is a steeply dipping to vertical northwest trending fault zone with right-lateral strike-slip displacement (Dibblee, 1980, Drawing 2). Geomorphic evidence for recent surface displacement along the fault includes a prominent linear east facing scarp up to 50 feet in height which borders the east side of the town and passes immediately east of Mission San Juan Bautista located 1000 feet northwest of the site (Brabb et. al. 1966, Hall and Glare, 1979, Sylvester et. al., 1980). This scarp has been formed in Holocene Age alluvium. The southernmost extent of documented surface rupture along the fault during the great 1906 earthquake occurred within a well defined fault trace located just northwest of the town, as shown on Drawing 1.

Historic horizontal fault creep is well documented along this segment of the San Andreas fault and the displacement is visible in several places where the fault crosses roads and other structures (see Drawing 1). Creep meters installed by the U.S. Geological Survey to measure the displacement at Nyland Ranch 1/2 mile northwest of town and at another site one mile southeast of the town, suggest that generally variable creep rates ranging from 12 millimeters per year to 5 millimeters per year have occurred along this portion of the fault since 1976. The low hill and fault scarp upon which the town has been built has been interpreted as a broad compressional uplift resulting from the differential creep rates and crustal shortening produced along the fault (Nason, 1971). Recent first order level studies, performed across the uplift and scarp, however, have failed to show vertical movement of undoubted tectonic origin (Sylvester et.al., 1980). In the vicinity of the site, the San Andreas has been mapped as a single active fault trace with a possible second concealed parallel strand approximately 250 feet northeast of the site (see Drawing 1). Recent fault evaluation studies of the San Andreas fault have been performed in adjacent quadrangles to the northwest and southeast (Hart et. al., 1981).

GEOLOGIC SITE CONDITIONS

Surface

The proposed site is a gently sloping, grass covered field bounded by the existing school buildings and Nyland Drive on the south, The Alameda on the west, Pearce Lane on the north and undeveloped agricultural land on the east (Drawing 3). The property is roughly bisected by a shallow east flowing drainage swale. A low hill (compressional uplift?) exists in the northeast corner of the parcel.

A five to ten foot high easterly facing scarp and the mapped trace of the San Andreas fault are located immediately northeast of the site. A shallow southeasterly flowing creek is present at the base of this scarp. The scarp can be traced 1000 feet northwest to the area of the Mission San Juan Bautista where there is positive evidence of active fault creep. Right lateral offsets exist in a concrete wall and stairway in the old rodeo grandstand at this location and springs are also reported from the scarp (Hall and Glare, 1979). To the southeast of the site, the scarp is traceable for a distance of approximately 500 feet to a second active creep zone shown on the Special Studies Zone Map (see Drawing 1).

No surface evidence of active faulting was observed within the property limits during our reconnaissance of the site or aerial photograph review. Our review of aerial photographs, site reconnaissance and the magnetic surveys, however, strongly indicate a fault alignment as shown on the State of California Special Studies Zone Map of the San Juan Bautista Quadrangle (see Drawing 1).

Subsurface

The subsurface soils encountered in the exploratory trenches consisted generally of a two to four foot thick sandy silt topsoil horizon overlying irregularly bedded sandy clay, silt and gravelly to silty sand alluvial deposits to the maximum depth explored of 12 feet. Up to six feet of artificial fill was encountered overlying alluvium in a short interval of Exploratory Trench No. 1. The silt, sand and clay beds encountered in the trenches were generally flat lying and readily distinguishable. The beds were generally continuous laterally and could be traced on the trench walls for considerable distances. All areas where the bedding displayed irregular changes in thickness or where intertongueing contacts, pinch outs or scour and fill structures were encountered were closely examined for possible evidence of faulting.

A detailed description of the materials encountered in the trenches is presented in the Logs of Exploratory Trench No. 1 and 2, Drawings 4, 5 and 6. No evidence of offset bedding, shearing or other displacement indicative of faulting was found in the two trenches.

Groundwater was encountered in both trenches in close proximity to the natural drainages on the property. Free groundwater was encountered at a depth of approximately 8 1/2 feet in a sand layer at the eastern end of Exploratory Trench No. 1. Exploratory Trench No. 2 encountered heavy groundwater flows from a clean coarse sand bed in several areas of the trench at depths of approximately 4 to 5 feet. Excessive groundwater seepage and caving occurred below this depth and precluded deeper excavations. Trench No. 2 was originally excavated an additional 65 feet to the west (total length of trench was 215 feet), however, caving due to groundwater seepage occurred in the western end of the excavation preventing further logging to be performed in this area (see Drawing 6). Past high groundwater levels and springs are known to have existed in the area of the Mission northwest of this site and may be attributable to a groundwater barrier created by the San Andreas fault (Hill and Glase, 1979).

MAGNETOMETER SURVEY

A total of two magnetometer traverses were performed in a southwest to northeast direction across the site and eastward across the low lying scarp immediately east of the site and adjoining 150 feet of the plowed agricultural field. The location of the traverses are shown on Drawing 3, and the results are presented on Drawing 7. The purpose of the magnetometer surveys was to locate possible anomalous variations in the magnetic field indicative of faulting.

As shown on Drawing 1, with the exception of the anomalous values caused by overhead power lines along The Alameda, the relative variations in the magnetic intensities recorded across the school district property are generally within a few gammas. Step downs in average magnetic intensity of 30 and 20 gammas in Magnetometer Lines No. 1 and 2, respectively, are present, however, 20 to 40 feet northeast of the property line. The magnetic intensity declines occur at the approximate location of the San Andreas fault as identified in this report and shown on the CDMG San Juan Bautista quad (see Drawing 1). The small magnetic intensity stepdown going from west to east across the fault may reflect crustal shortening and a higher bedrock surface on the west side of the fault, as suggested by the scarp at the east side of the school district property.

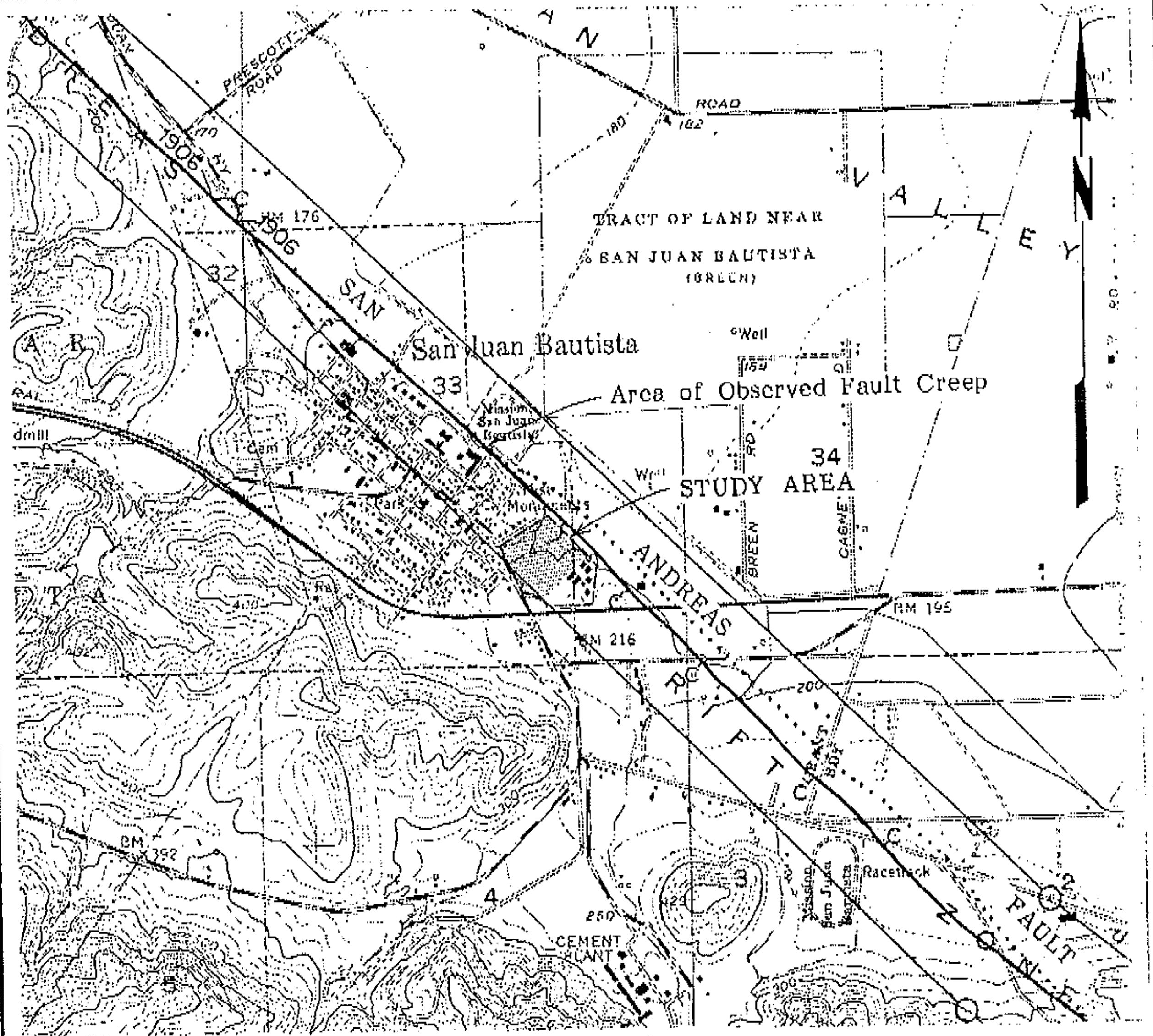
CONCLUSIONS AND RECOMMENDATIONS

The findings of our investigation indicate that the proposed San Juan Junior High School addition and emergency relocatable classrooms will be located outside the zone of fault rupture hazard. We found no evidence of faulting within the site and conclude that the likelihood of surface fault rupture within the area investigated is low. As shown on Drawing 3, the most probable location of the San Andreas fault is 30 to 40 feet east of the property based on the scarp alignment, active creep zone alignment, aerial photograph study and the results of our magnetometer survey.

Based on the data obtained, we believe that the location of the San Andreas fault in the vicinity of the property has been sufficiently defined for the purposes of the proposed new construction. We recommend that a setback of 50 feet from the indicated fault trace shown on Drawing 3 be maintained for the siting of the future relocatable classroom buildings and additions. It should be noted that the site is in an area of high seismic activity and the classroom buildings should be designed to withstand strong ground shaking in accordance with applicable seismic provisions of the Uniform Building Code, latest edition and/or local regulations. Although the classrooms will probably be subjected to at least one strong earthquake during their lifetime, the risk of fault offset is considered low for classrooms sited in accordance with the recommendations of this report.

ADDITIONAL STUDIES

This investigation has been performed solely to establish the suitability of the proposed building areas with respect to the hazard of fault offset. A final geotechnical investigation should be performed for building and foundation design purposes.



EXPLANATION

1906 C — Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

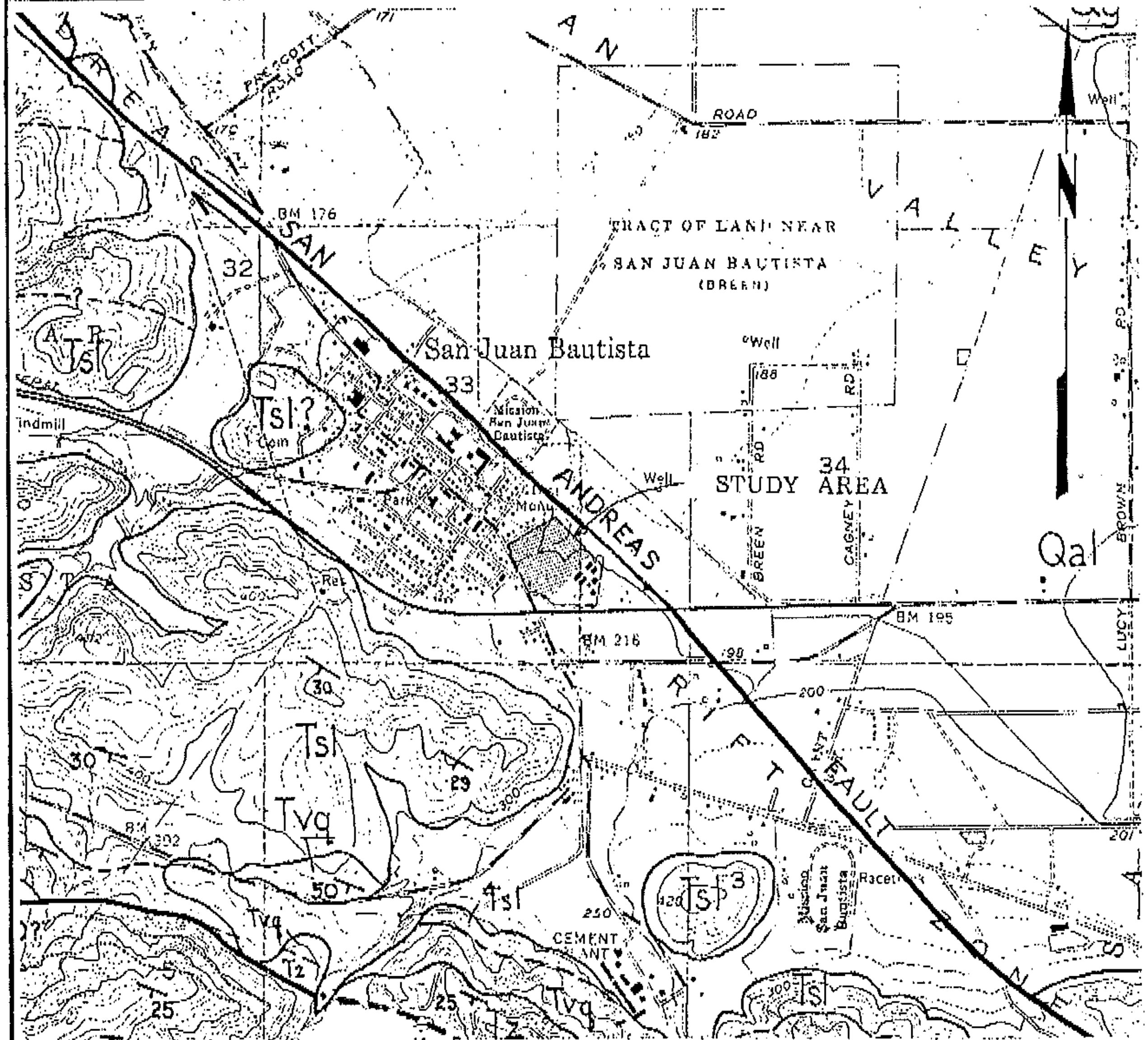
BASE: State of California Special Studies Zone Map, San Juan Bautista Quadrangle, July 1, 1974.

SITE LOCATION AND SPECIAL STUDIES ZONE MAP

CLEARY CONSULTANTS, INC.
Geological and Geotechnical Engineers

SAN JUAN JUNIOR HIGH SCHOOL
San Juan Bautista, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 2000'	479.1	April 1987	1



EXPLANATION

Qal - Alluvium
Tz - Zayante Sandstone
Tvq - Vaqueros Sandstone
Tsl - San Lorenzo Formation Siltstone and Claystone

29 Strike and dip of bedding

Contact, dashed where approximate

Fault, dashed where inferred, arrows indicate strike-slip movement

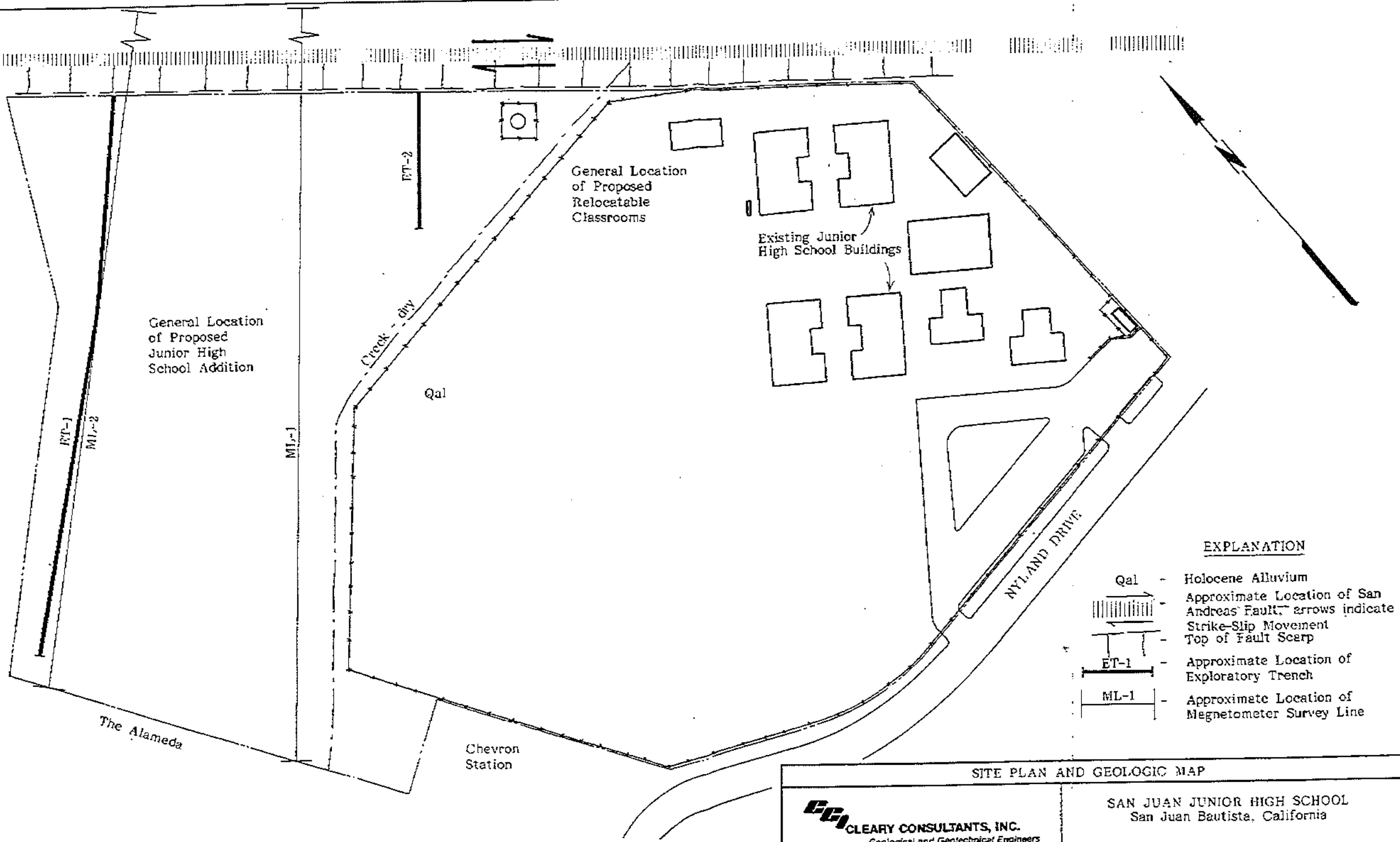
BASE: Dibblee, T.W., Nilsen, T.H. and Brabb, E.E., 1979

REGIONAL GEOLOGIC MAP

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

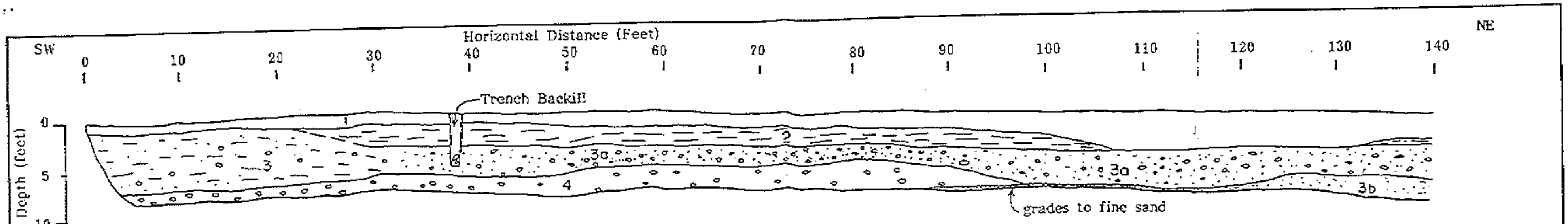
SAN JUAN JUNIOR HIGH SCHOOL
San Juan Bautista, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 2000'	479.1	April 1987	2



SITE PLAN AND GEOLOGIC MAP				
CCI CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 100'	479.1	April 1987	3

Base: Site Plan by Porter-Jensen-Hansen-Manzagol, 4/87



1 Sandy Silt, dark brown, slightly moist, fine sand, fine roots (ML)

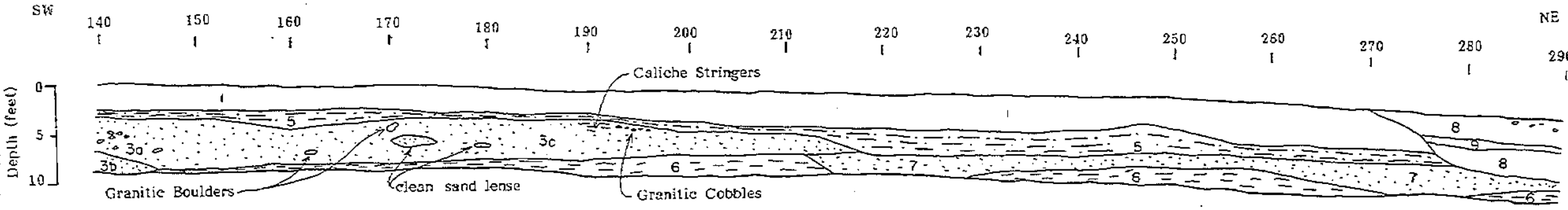
2 Sandy Clay, moist, grey-brown, 10-15% medium sand, very stiff (CL-CH)

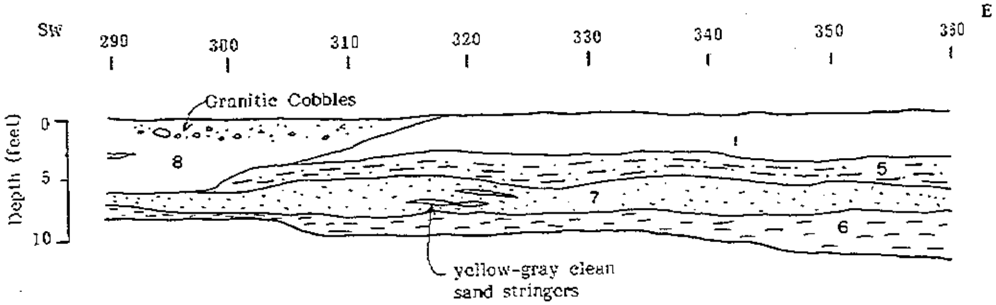
3 Clayey Sand, moist, gray-brown, fine sand, scattered gravels, decreasing clay downward (SC)

3a Silty Sand, moist, gray-brown, 15-25% decomposed granite cobbles up to 4", very dense (SM)

3b Sand, moist, orange-brown, medium grained, scattered fine gravels, clean (SP)

3c Sand, moist, yellow-brown, medium dense, coarse sand, trace silt, scattered fine gravels and decomposed granite cobbles (SP)





4 Sand, moist, orange-brown, coarse grained, 20-30% granite cobbles, clean (SP)

5 Sandy Silt, pale brown to white, moist, clayey, fine to coarse sand, abundant caliche (ML)

6 Sandy Clay, pale brown to yellow brown, fine sand, scattered caliche (CL)

7 Silty Sand, yellow brown, moist, fine sand, caliche nodules (SM)

8 Sandy Silt, dark brown, moist, fine to coarse sand, scattered sandstone cobbles in upper 2', wood debris, voids (Fill)(ML)

9 Silty Sand, yellow gray, moist, fine sand (Fill)(SM)

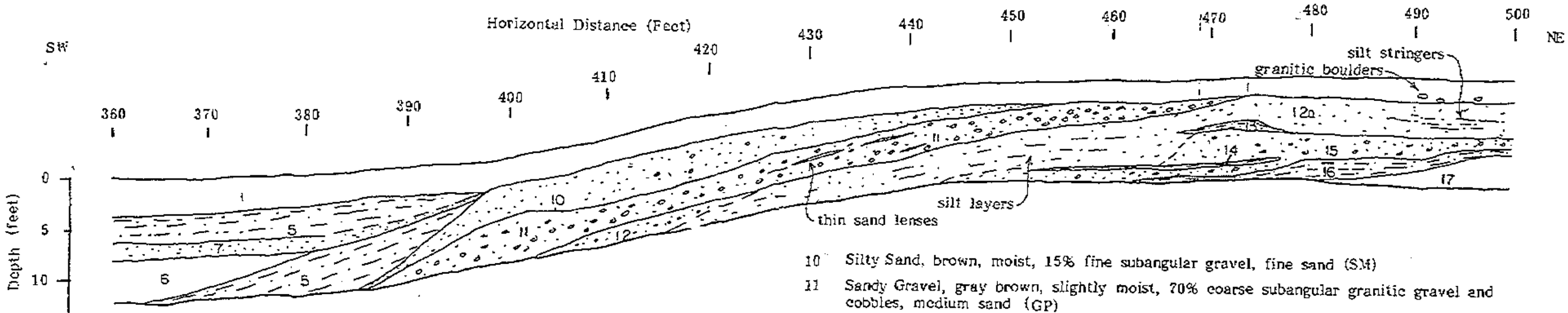
(CONTINUED ON DRAWING NO. 5)

LOG OF EXPLORATORY TRENCH NO. 1

CLEARY CONSULTANTS, INC.
Geological and Geotechnical Engineers

SAN JUAN JUNIOR HIGH SCHOOL
San Juan Bautista, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 10'	479.1	April 1987	4



10 Silty Sand, brown, moist, 15% fine subangular gravel, fine sand (SM)

11 Sandy Gravel, gray brown, slightly moist, 70% coarse subangular granitic gravel and cobbles, medium sand (GP)

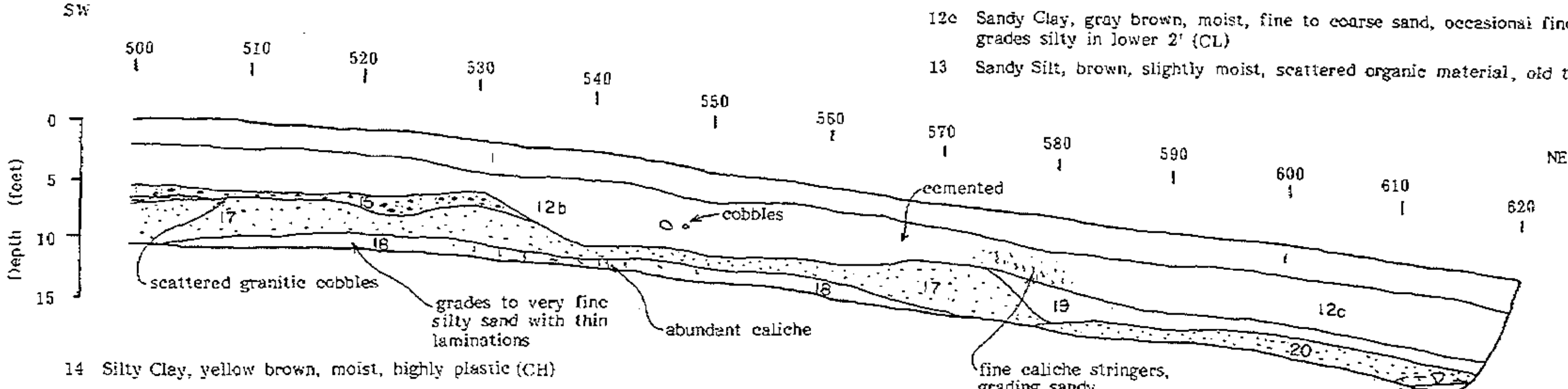
12 Sand, yellow gray, slightly moist, medium to coarse, gravelly stringers (SP)

12a Silty Sand, yellow brown, moist, fine sand, occasional fine subangular gravel, silt stringers (SM-ML)

12b Sandy Silt, brown, slightly moist, 20% coarse to fine sand, trace clay (SM-ML)

12c Sandy Clay, gray brown, moist, fine to coarse sand, occasional fine subangular gravel, grades silty in lower 2' (CL)

13 Sandy Silt, brown, slightly moist, scattered organic material, *old topsoil horizon* (ML)



14 Silty Clay, yellow brown, moist, highly plastic (CH)

15 Gravelly Sand, dark brown to gray brown, slightly moist, 10% fine subangular gravel, medium sand, friable (SP)

16 Sandy Silt, yellow gray, moist, scattered coarse gravel, fine sand (ML)

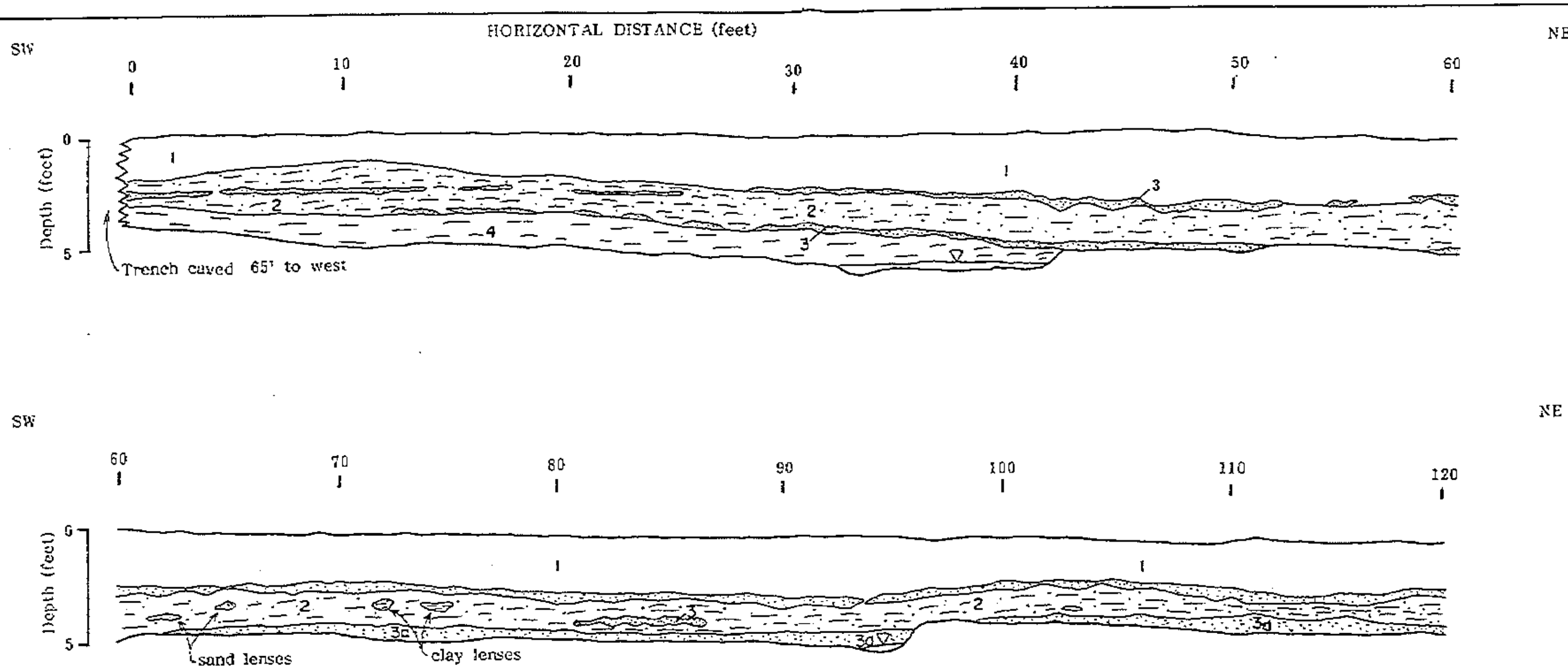
17 Silty Sand, yellow brown, moist, minor fine gravel, fine to coarse sand, scattered caliche (SM)

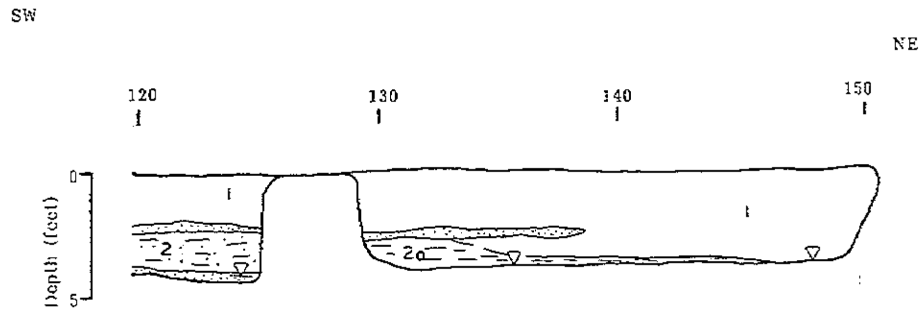
18 Gravelly Sandy Silt, yellow gray to white, 15% fine subangular gravel, fine to coarse sand, abundant caliche (ML)

19 Sandy Silt, yellow gray, moist, 10% fine subangular gravel, fine to coarse sand (ML)

20 Sand, yellow brown, moist, locally saturated, poorly sorted, fine to coarse, *scattered granitic gravels and cobbles, minor silt* (SM)

LOG OF EXPLORATORY TRENCH NO. 1				
CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 10'	479.1	April 1987	5

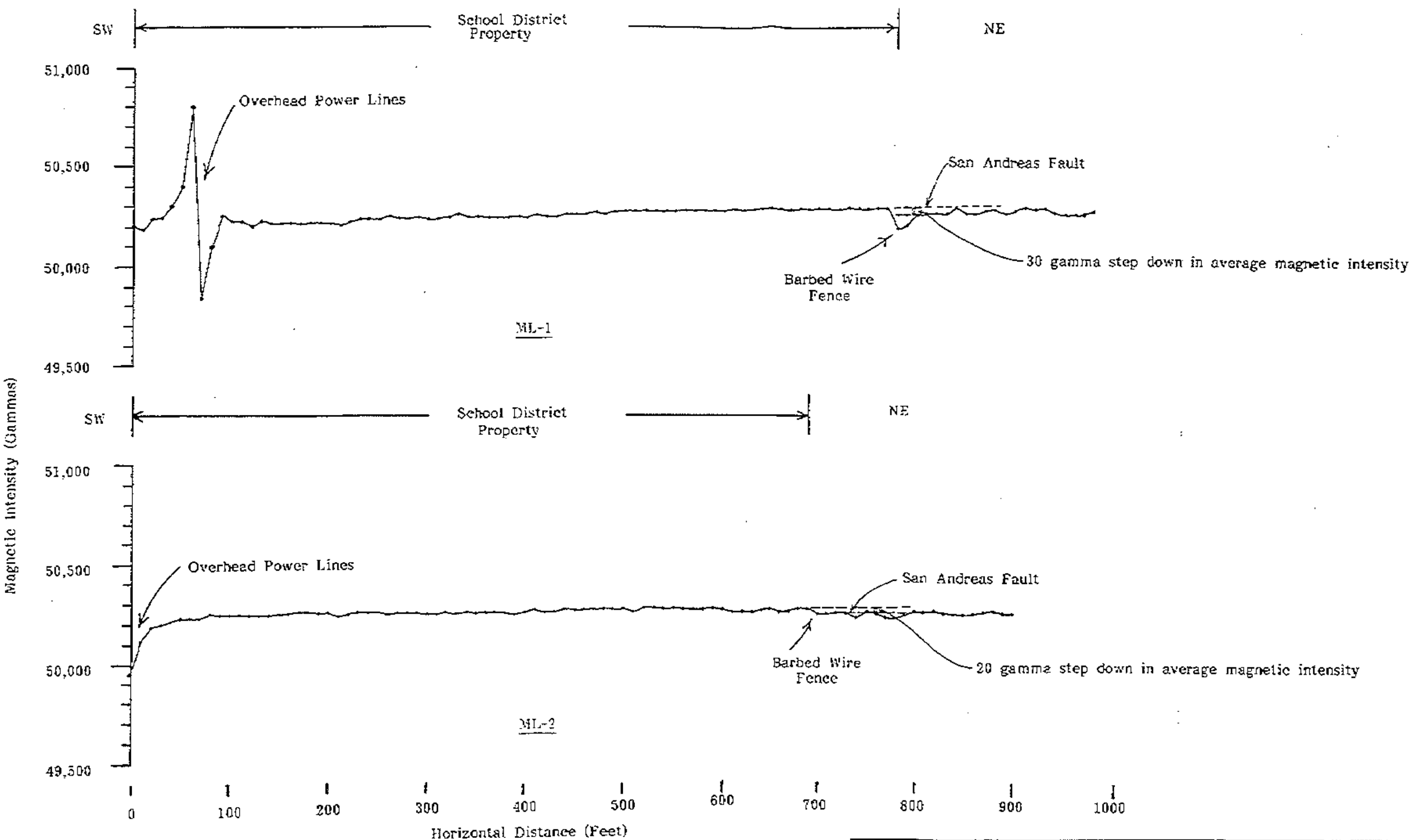




1 Sandy Silt, brown, very moist, fine sand, scattered rounded gravels, firm (ML)
2 Sandy Clay, gray brown, wet, fine sand, sand stringers and pockets (CL)
2a Silty Clay, dark brown, wet, firm (CH)
3 Sand, light brown, clean, coarse grained (SW)
3a Sand, light brown, saturated, clean, coarse (SW)
4 Silty Clay, black, wet, scattered coarse gravels (CH)

LOG OF EXPLORATORY TRENCH NO. 2

CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 5'	479.1	April 1987	6



MAGNETOMETER SURVEY LINES 1 AND 2				
CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	As Shown	479.1	April 1987	7

APPENDIX G

PHOTOGRAPHS

Photograph No. 1: View to east. Office building (Building A).

Photograph No. 2: View to south. Classroom building (northeast corner Building D).


Photograph No. 3: View to southwest. Classroom buildings (Building E on left, Building D on right).


Photograph No. 4: View to east. Classroom building (Building E) on left and kitchen/multi-purpose building on right.

Photograph No. 5: View to south. Play courts and classroom building (Building C) with gymnasium to right.

Photograph No. 6: Play courts (site of proposed multi-purpose building) and gymnasium beyond.

Photograph No. 7: Trench A, View to northeast, east end.

Photograph No. 8: Trench A during excavation. View to southwest.

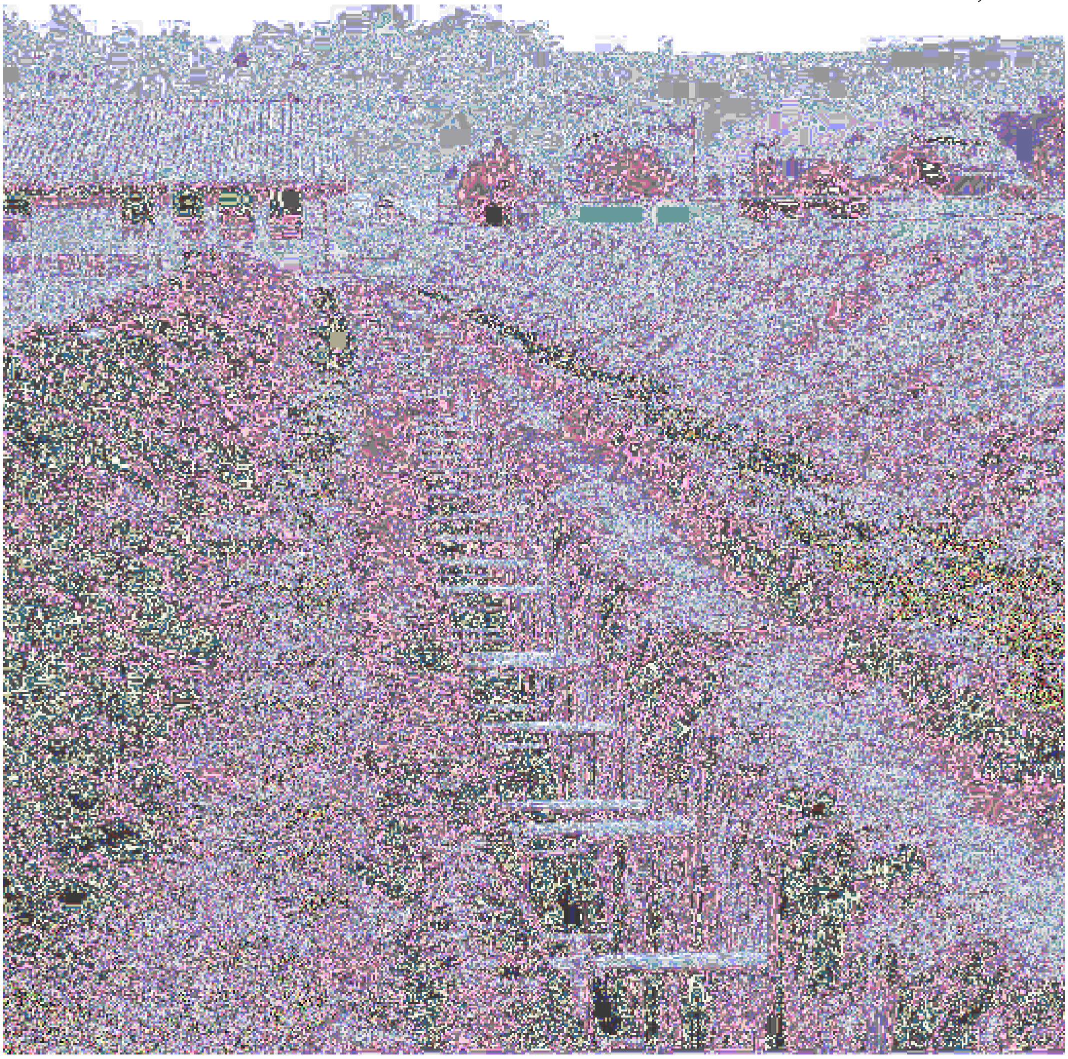
Photograph No. 9: Trench A, station 133.

Photograph No. 10: Trench A, station 115.

Photograph No. 11: Trench A, station 45.

Photograph No. 12: Trench A, station 6.

Photograph No. 13: Trench B, View to northeast.



Photograph No. 14: Trench B, View to southwest.

Photograph No. 15: Trench B. Station 120.


Photograph No. 16: Trench B. Station 150.


Photograph No. 17: Trench B. Station 250.

APPENDIX G

REPORT ON: ENERGY MEASUREMENT FOR DYNAMIC PENETROMETERS, RIG 156

GRL engineers, inc.
Dynamic Measurements and Analyses

Job No. 198075-2

Report on:
Energy Measurement for Dynamic Penetrometers – Standard Penetration Test
Truck 75192H1 CME 75 Drill Rig Calibration
Lemoore, CA

Prepared for Moore Twining Associates, Inc.

By Camilo Alvarez, PE & Diego A. Campos

July 10, 2019

July 11, 2019

Allen Bushey
Moore Twining Associates, Inc

Re: Energy Measurement for Dynamic Penetrometers
Standard Penetration Test (SPT) on Truck 75192H1 CME 75 drill rig
Lemoore, CA. GRL Job No. 198075-2

Dear Mr. Allen Bushey:

This report transmits our findings from energy measurements and related data analysis conducted by GRL Engineers, Inc. (GRL) for your Truck 75192H1 mounted CME 75 drill rig located in Lemoore, CA. One automatic hammer and penetrometer system was monitored during Standard Penetration Test (SPT) of the test borehole. Dynamic testing summarized in this report was conducted on July 10, 2019.

The purpose in collecting the SPT energy measurements was to compute the energy transfer efficiency for a single SPT hammer. To meet this objective, an 8G Model, Pile Driving Analyzer® (PDA) utilizing the SPT Analyzer feature was used to acquire and process the dynamic test data. Additional information regarding the testing equipment and analytical procedures is provided in Appendix A.

Test Sequence

Using an instrumented AW-J rod for a Truck 75192H1 mounted CME 75 drill rig at test borehole, energy measurements were made at five sample depths for the drill rig. From BH1, the dynamic measurements were obtained from sample depths of 2.0, 5.0, 10.0, 15.0 and 20.0 ft. Each sample depth consisted of energy measurements of 18 inches of driving.

Energy Transfer Measurements

A Model 8G Pile Driving Analyzer was used to take measurements of strain and acceleration. The strain and acceleration signals were conditioned and converted to forces and velocities by the PDA. The PDA interprets the measured dynamic data according to the Case Method equations. Force and velocity records from the PDA were also viewed graphically on an LCD screen to evaluate data quality. All force and velocity records were also digitally stored for subsequent analysis.

The maximum energy transferred to the rod (EMX) was calculated by integrating both the force and velocity records over time as follows:

$$EMX = \int F(t)V(t)dt$$

Where: $F(t)$ = the force at time t
$V(t)$ = the velocity at time t

The energy transfer ratio or efficiency is computed by dividing EMX by the theoretical SPT hammer energy of 350 lb-ft (computed from the product of the hammer weight, assumed to be the standard 140 lbs, and the fall height, assumed to be 2.5 ft). The SPT N values can then be corrected for a nominal 60% transfer efficiency, $N_{60,}$ as follows:

$$N_{60} = (e_m / 60)\ N_m$$

Where: e_m = the measured transfer ratio (ETR)
N_m = the measured SPT “N” value

Conclusions

Table 1 in Appendix B presents a summary of the average transferred energy and the energy transfer ratio for the single drill rig at each sample depth calculated using the *EMX* equation. Included in Table 1 are also average values of the hammer operating rate, maximum impact force and maximum velocity of the rod. The overall performance, which represents the average of data from all sample depths for each rig/rod type is also shown. Complete data, including the maximum, minimum and standard deviation for each sampling depth, is included in Appendix B.

For the Truck 75192H1 mounted CME 75 drill rig-RIG 156, the average energy transfer ratio from individual sample depths ranged from 81.3 to 96.9%.

The average, overall transfer ratio (for all sampling depths weighted by N-values for each sample) were as follows:

SPT Rig (*Serial Number*)	Overall Transfer Efficiency	Hammer Operating Rate (BPM)
Truck 75192H1 CME 75 drill rig 156	**88.9%**	**40.4**

Presented N_{60} values, provided in the Table 1 in Appendix B, does not account for any required corrections such as those for overburden or sampling spoon.

We appreciate the opportunity to be of assistance to you. Please do not hesitate to contact us if you have any questions regarding this report, or if we may be of further service.

Respectfully,
GRL Engineers, Inc.

REGISTERED PROFESSIONAL ENGINEER
Camilo A Alvarez
No. 67938
Exp. 6/30/21
Civil
STATE OF CALIFORNIA

Camilo Alvarez, P.E.
Senior Engineer

Diego Campos, EIT
Engineer

APPENDIX A
AN INTRODUCTION INTO SPT DYNAMIC PILE TESTING

1. BACKGROUND

The Standard Penetration Test is frequently conducted as an in-situ assessment of soil strength. This test requires that a 140 lb weight is dropped 30 inches onto a drive rod at whose bottom a sampler is usually installed. The sampler is driven for 18 inches; the number of blows required for the last 12 inches of driving is the so-called N-value. The N-value may be used as a strength indicator for foundation design or as a means of assessing the liquefaction potential of soils.

Obviously, the SPT hammer efficiency is an important consideration when using the N-values for design purposes. Measurements have indicated that the energy in the drive rod is sometimes only 30% and and may reach 90% of the potential or rated energy of the SPT hammer (E-rated = 0.35 kip-ft or 0.475 kJ). The type of hammer used to drive the rod is the main reason for these variations. On the average, the energy in the drive rod is 60% of the standard rated energy.

Because of the variability of energy, methods based on N-values are considered unreliable. However, measurements during SPT testing using the Case Method can be done on a routine basis and these measurements yield the transferred energy values. With measured energy, EMX, known, an adjustment of the measured N-value, N_m, can be made as follows.

$$N_{60} = N_m \left[E_m / (0.6E_r)\right] \qquad (1)$$

Thus, if the measured energy value is equal to the normally expected transferred energy of 60% of E-rated then the adjusted and measured N-values are identical. On the other hand, if the measured energy is only 30% then the adjusted blow count will be reduced by 50%.

2. DYNAMIC TESTING AND ANALYSIS METHODS APPLIED TO SPT

The Case Method of dynamic pile testing, named after the Case Institute of Technology where it was developed between 1964 and 1975, requires that a substantial ram mass (e.g. a pile driving hammer) impacts the pile top such that the pile undergoes at least a small permanent set. Thus, the method is also referred to as a "High Strain Method". The Case Method requires dynamic measurements on the pile or shaft under the ram impact and then a calculation of various quantities. Conveniently, for SPT applications, the measurements and analyses are done by a single piece of equipment: the SPT Analyzer. The Pile Driving Analyzer® (PDA) is also suitable to perform these measurements and data processing.

A related analysis method is the "Wave Equation Analysis" which calculates a relationship between bearing capacity, pile stresses, transferred energy and field blow count. The GRLWEAP™ program performs this analysis and provides a complete set of helpful information and input data. This program can be used very effectively to simulate the SPT driving process.

3. MEASUREMENTS

GRL uses equipment manufactured by Pile Dynamics, Inc. The system includes either an SPT-Analyzer™ (SPTA) or a Pile Driving Analyzer® (PDA), an instrumented rod section and two accelerometers. SPT energy testing is very closely related to and borrows procedures from dynamic pile testing. Those interested in the basis of the SPT energy testing method may obtain extensive literature on dynamic pile testing from GRL Engineers, Inc.

3.1 SPT Analyzer or Pile Driving Analyzer

The basis for the results calculated by the SPTA or PDA are strain and acceleration measured in an instrumented rod section. These signals are converted to rod top force, F(t), and rod top velocity, v(t). The SPTA or PDA conditions, calibrates and displays these signals and immediately computes average pile force and velocity thereby eliminating bending effects. The product of these two measurements is then integrated over time which yields the energy transferred to the instrumented section as a function of time (see Section 4.1).

For convenience and accuracy, strain measurements are usually taken on an instrumented section of SPT drive rod. Ideally, the section properties of the instrumented rod and those of the drive rod are the same, however, using subs, other sections can also be utilized.

For the instrumented section, PDI provides a force calibration in such a way that the output of the instrumented rod is directly calculated without the need for an accurate elastic modulus or cross sectional area of the rod section.

The acceleration measurements are often demanding in the SPT environment, because of high frequency and high acceleration motion components. An experienced measurement engineer, therefore, has to evaluate the quality of this data before final conclusions are drawn from the numerical results calculated by SPTA or PDA.

SPTA or PDA records are taken while the standard N-value is acquired in the conventional manner. This then allows a direct correlation between N-value and average transferred energy.

3.2 HPA

The SPT hammer's ram velocity may be directly obtained using radar technology in the Hammer Performance Analyzer™. The impact velocity results can be automatically processed with a PC or recorded on a strip chart. HPA measurements yield a hammer kinetic energy, but not the energy transferred to the drive rod.

4 RECORD EVALUATION BY SPTA OR PDA

4.1 HAMMER PERFORMANCE

The PDA calculates the energy transferred to the pile top from:

$$E(t) = \int_0^t F(\tau)v(\tau)\, d\tau \qquad (2)$$

The maximum of the E(t) curve is often called **ENTHRU or EMX;** it is the most important quantity for an overall evaluation of the performance of a hammer and driving system. **EMX** allows for a classification of the hammer's performance when presented as, e_T, the rated transfer efficiency, also called energy transfer ratio (**ETR**) or global efficiency.

$$e_T = EMX/E_R \qquad (3)$$

where E_R is the hammer manufacturer's rated energy value or 0.35 kip-ft (0.475 kJ) in the case of the SPT hammer.

Often in the SPT literature one finds also reference to the EF2 energy. This evaluation is based on assumed proportionality between force and velocity (see also Section 5):

$$v(t) = F(t) / Z \qquad (4)$$

where Z = EA/c is the pile impedance, E is the elastic modulus, A is the cross sectional area and c is the speed of the stress wave in the pile material..

Combining equations 2 and 4 leads to

$$EF(t) = \int_0^t F(\tau)^2 / Z\, d\tau \qquad (5)$$

The EF2 transferred energy value is the EF-value at the time t = 2L/c, where L is the drive rod length and c is the stress wave speed in steel (16,800 ft/s or 5,124 m/s). Since the force is easier to measure than both force and velocity, Equation 5 is preferred by some test engineers. However, the EF method is fraught with errors and certain correction factors have to be applied to make it approximately correct. Among the error sources are the following:

- Proportionality is often violated prior to time 2L/c. The proportionality between force and velocity in a downward traveling wave only holds if the wave does not encounter a disturbance prior to reflecting off the pile toe. Such disturbances include a change in cross sectional area, an open or loose splice or joint, or resistance along the shaft.

- Using only one force measurement precludes a data quality check based on the proportionality between force and velocity. Thus, a force measurement that is for some reason in error may not be detectable, which will lead to errors in the EF2 value. Data quality checks will be discussed further in Section 5.

The use if EF2 is therefore not recommended but it is often included in result presentations for the sake of completeness.

4.2 STRESSES

During SPT monitoring, it is also of interest to monitor compressive stresses at both the top of the drive rod and at its bottom.

At the pile top (location of sensors) the maximum compression stress averaged over the rod's cross section, **CSX**, is directly obtained from the measurements. Note that this stress value refers to the instrumented section. If the rod has a different cross sectional area then the stress in the rod will be different from CSX.

The SPTA or PDA can also calculate, in an approximate manner, the force at the rod bottom, **CFB**. To obtain the corresponding stress, this force value should be divided by the appropriate cross sectional area, e.g. by the rod area just above the sampler or by the sampler area itself. Of course, non-uniform stress components as they might occur at the sampler tip due to a sloping rock are not considered in this calculation.

5. DATA QUALITY CHECKS

Quality data is the first and foremost requirement for accurate dynamic testing results. It is therefore important that the measurement engineer performing SPTA or PDA tests has the experience necessary to recognize measurement problems and take appropriate corrective action should problems develop. Fortunately, dynamic pile testing allows for certain data quality checks because two independent measurements are taken that have to conform to the so-called proportionality relationship.

As long as there is only a wave traveling in one direction, as is the case during impact when only a downward traveling wave exists in the rod, force and velocity measured at its top are proportional

$$F = v\,Z \qquad (5)$$

where Z is again the pile impedance, Z = EA/c. This relationship can also be expressed in terms of stress

$$\sigma = F/A = v\,(E/c) \qquad (6)$$

or strain

$$\epsilon = \sigma/E = v / c \qquad (7)$$

This means that the early portion of strain times wave speed must be equal to the velocity unless the proportionality is affected by high friction near the pile top or by a pile cross sectional change not far below the sensors. Checking the proportionality is an excellent means of assuring meaningful measurements but is only truly meaningful for perfectly uniform rods. Open or loose splices, for example, will lead to a non-proportionality. For SPT rods it is fortunate that usually no soil resistance acts along the shaft and for that reason, proportionality can exist until the stress wave returns from sampler top or rod bottom unless connectors are not sufficiently tightened or have a significant mass.

Velocity data quality can also be checked by looking at the final displacement, DFN, which is calculated from the acceleration by double integration. If the calculated final displacement is much higher or lower than indicated by the N-value, the accelerometer attachment may be loose or the sensor may be faulty. If major drift in the velocity is observed, the EMX value may be in error, even though proportionality from impact to time 2L/c exists. In this case, it may be useful to evaluate the energy transferred to the drill rod at time 2L/c, which is calculated by the PDA or SPTA as the E2E quantity.

Appendix B

SPT Analyses Results

Summary of SPT Test Results

Project: CME 75 - RIG 156 - 75192H1, Test Date: 7/10/2019

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Blows Applied /6"	**N Value**	**N60 Value**	Average FMX kips	Average VMX ft/s	Average BPM bpm	Average EFV ft-lb	Average ETR %
8.00	**4-6-8**	**14**	**20**	29	17.6	44.4	320	91.5
9.00	**3-3-3**	**6**	**8**	27	18.2	37.2	284	81.3
12.50	**1-3-7**	**10**	**14**	28	18.0	40.0	339	96.9
18.50	**3-1-10**	**11**	**16**	30	17.5	40.0	307	87.6
23.50	**2-8-13**	**21**	**31**	29	17.0	39.1	302	86.2
			Overall Average Values:	29	17.5	40.4	311	88.9
			Standard Deviation:	1	0.6	2.3	20	5.7
			Overall Maximum Value:	31	19.1	44.7	373	106.6
			Overall Minimum Value:	27	16.6	37.1	271	77.6

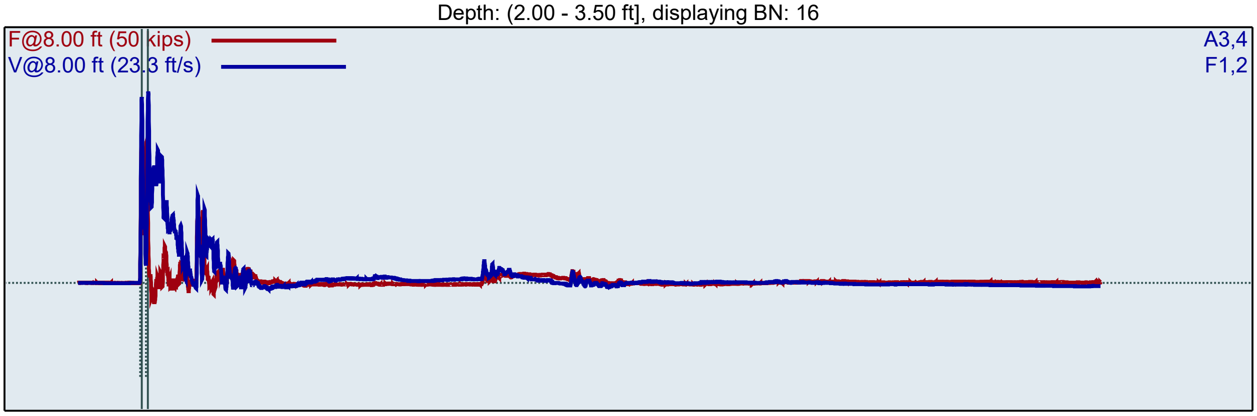
CME 75 - RIG 156 - 75192H1
DC

At 2 feet
Test date: 7/10/2019

AR: 1.20 in^2
LE: 8.00 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (2.00 - 3.50 ft], displaying BN: 16



F1 : [217AWJ2] 214.53 PDICAL (1.03) FF6
F2 : [217AWJ1] 214 PDICAL (1.03) FF6

A3 (PR): [K4695] 378 mv/6.4v/5000g (0.97) VF6
A4 (PR): [K1388] 384 mv/6.4v/5000g (0.97) VF6

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
1	4	28	17.1	1.9	298	85.1
2	4	29	17.6	44.3	308	88.0
3	4	29	17.5	44.6	323	92.3
4	4	28	17.3	44.0	325	92.9
5	6	28	17.3	44.6	316	90.3
6	6	29	17.7	44.0	337	96.3
7	6	28	17.3	44.7	310	88.6
8	6	28	17.1	44.6	310	88.7
9	6	29	17.5	44.3	331	94.6
10	6	29	17.6	44.6	320	91.4
11	8	29	17.4	44.4	330	94.2
12	8	29	17.3	44.5	325	92.8
13	8	29	17.9	44.4	335	95.7
14	8	29	17.8	44.4	315	90.1
15	8	30	17.5	44.4	316	90.2
16	8	28	17.5	44.4	309	88.3
17	8	28	17.9	44.5	311	88.8
18	8	29	18.0	44.4	321	91.6
	Average	29	17.6	44.4	320	91.5
	Std Dev	1	0.3	0.2	9	2.6
	Maximum	30	18.0	44.7	337	96.3
	Minimum	28	17.1	44.0	309	88.3

N-value: 14

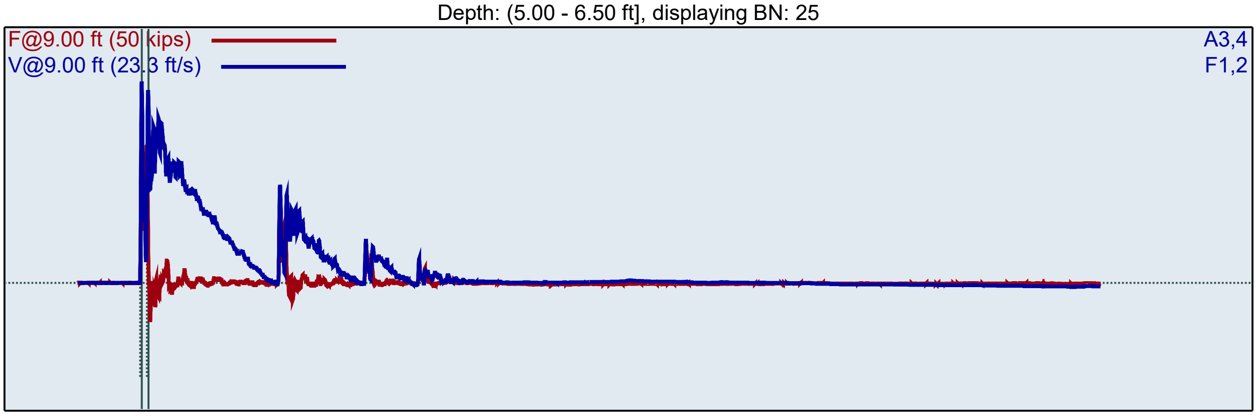
BN: 18 4-6-8

Sample Interval Time: 22.97 seconds.

CME 75 - RIG 156 - 75192H1 | At 2 feet
DC | Test date: 7/10/2019

AR: 1.20 in^2 | SP: 0.492 k/ft3
LE: 9.00 ft | EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (5.00 - 6.50 ft], displaying BN: 25



F1 : [217AWJ2] 214.53 PDICAL (1) FF6
F2 : [217AWJ1] 214 PDICAL (1) FF6

A3 (PR): [K4695] 378 mv/6.4v/5000g (1) VF6
A4 (PR): [K1388] 384 mv/6.4v/5000g (1) VF6

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
19	3	26	17.8	5.2	270	77.3
20	3	26	17.9	36.8	252	72.0
21	3	27	17.7	37.1	262	74.9
22	3	27	17.9	37.1	275	78.5
23	3	27	18.2	37.2	288	82.3
24	3	27	18.5	37.2	274	78.2
25	3	27	18.4	37.1	285	81.3
26	3	28	18.2	37.2	291	83.1
27	3	27	18.2	37.2	295	84.3
	Average	27	18.2	37.2	284	81.3
	Std Dev	0	0.2	0.1	8	2.3
	Maximum	28	18.5	37.2	295	84.3
	Minimum	27	17.9	37.1	274	78.2

N-value: 6

BN: 27 3-3-3

Sample Interval Time: 12.91 seconds.

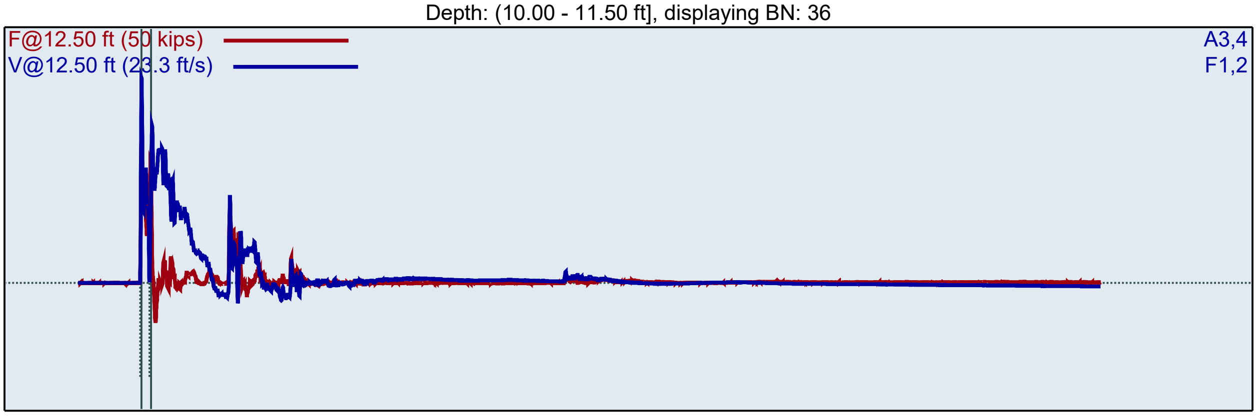
CME 75 - RIG 156 - 75192H1
DC

At 2 feet
Test date: 7/10/2019

AR: 1.20 in^2
LE: 12.50 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (10.00 - 11.50 ft], displaying BN: 36



F1 : [217AWJ2] 214.53 PDICAL (1) FF6
F2 : [217AWJ1] 214 PDICAL (1) FF6

A3 (PR): [K4695] 378 mv/6.4v/5000g (1) VF6
A4 (PR): [K1388] 384 mv/6.4v/5000g (1) VF6

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
28	1	27	17.7	1.9	308	87.9
29	3	28	17.5	39.6	314	89.8
30	3	29	17.8	40.1	320	91.4
31	3	28	17.1	40.2	329	94.1
32	7	28	17.3	40.2	322	91.9
33	7	28	17.4	40.2	321	91.7
34	7	28	17.9	40.3	350	100.0
35	7	29	18.0	40.0	349	99.7
36	7	28	18.7	39.8	349	99.8
37	7	29	18.9	40.0	365	104.3
38	7	29	19.1	39.9	373	106.6
	Average	28	18.0	40.0	339	96.9
	Std Dev	0	0.7	0.2	20	5.6
	Maximum	29	19.1	40.3	373	106.6
	Minimum	28	17.1	39.6	314	89.8

N-value: 10

BN: 38 1-3-7

Sample Interval Time: 14.99 seconds.

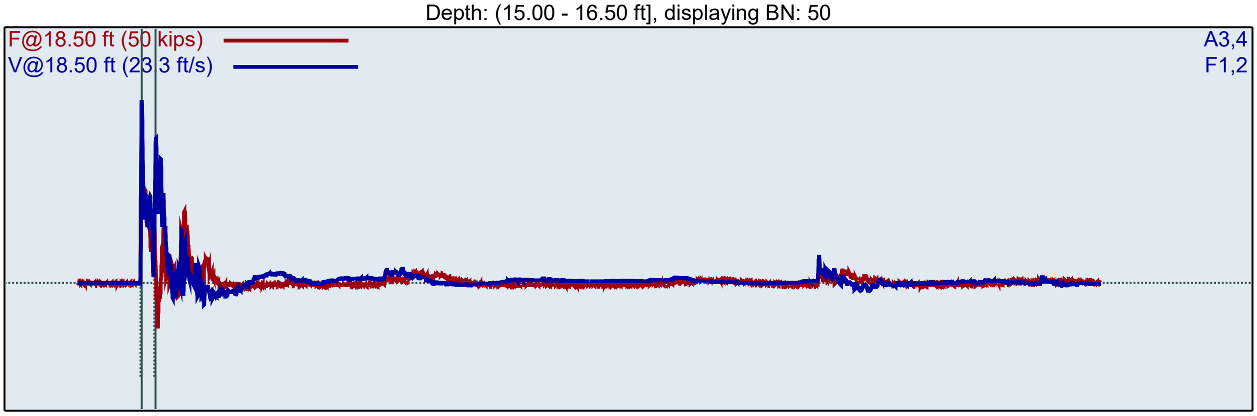
CME 75 - RIG 156 - 75192H1
DC

At 2 feet
Test date: 7/10/2019

AR: 1.20 in^2
LE: 18.50 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (15.00 - 16.50 ft], displaying BN: 50



F1 : [217AWJ2] 214.53 PDICAL (1) FF1
F2 : [217AWJ1] 214 PDICAL (1) FF1

A3 (PR): [K4695] 378 mv/6.4v/5000g (1) VF1
A4 (PR): [K1388] 384 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
39	3	28	18.2	13.7	264	75.6
40	3	31	18.7	40.4	278	79.5
41	3	31	18.5	40.5	279	79.6
42	1	29	18.5	40.5	271	77.6
43	10	30	18.1	40.2	310	88.6
44	10	29	17.1	40.2	313	89.5
45	10	29	17.2	40.1	313	89.4
46	10	29	17.1	40.2	309	88.3
47	10	31	18.5	39.9	321	91.8
48	10	29	17.0	39.9	304	86.7
49	10	31	18.0	39.8	310	88.6
50	10	29	16.7	39.8	302	86.3
51	10	29	16.9	39.7	314	89.8
52	10	29	17.1	39.7	306	87.3
	Average	30	17.5	40.0	307	87.6
	Std Dev	1	0.6	0.2	12	3.5
	Maximum	31	18.5	40.5	321	91.8
	Minimum	29	16.7	39.7	271	77.6

N-value: 11

BN: 52 3-1-10

Sample Interval Time: 19.45 seconds.

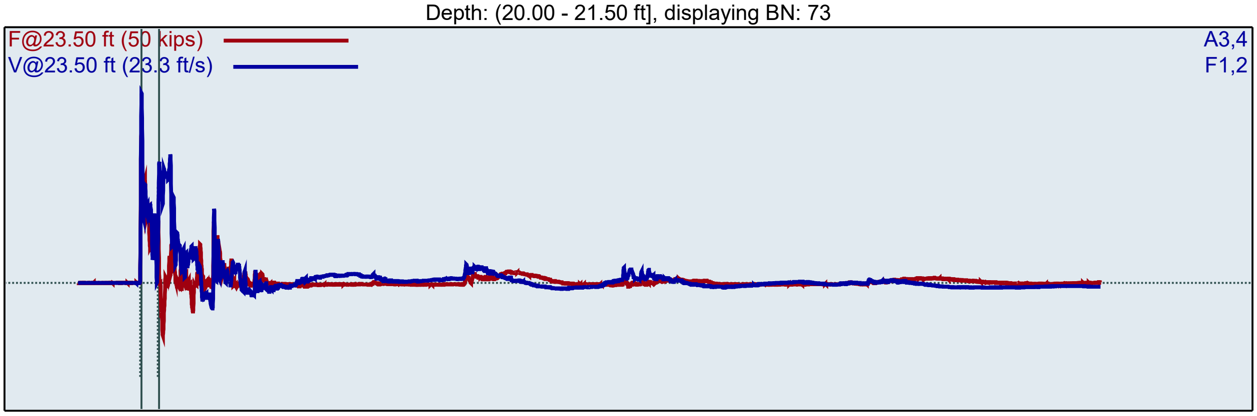
CME 75 - RIG 156 - 75192H1
DC

At 2 feet
Test date: 7/10/2019

AR: 1.20 in^2
LE: 23.50 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (20.00 - 21.50 ft], displaying BN: 73



F1 : [217AWJ2] 214.53 PDICAL (1) FF6
F2 : [217AWJ1] 214 PDICAL (1) FF6

A3 (PR): [K4695] 378 mv/6.4v/5000g (1) VF6
A4 (PR): [K1388] 384 mv/6.4v/5000g (1) VF6

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
53	2	28	17.3	4.6	277	79.1
54	2	29	16.8	38.3	273	78.0
55	8	29	17.0	38.8	291	83.2
56	8	28	17.0	38.8	281	80.4
57	8	28	16.6	39.1	283	80.8
58	8	29	16.7	39.0	308	88.0
59	8	29	17.0	39.1	296	84.4
60	8	29	16.8	39.1	305	87.1
61	8	28	16.7	39.1	289	82.5
62	8	29	17.4	39.2	307	87.7
63	13	28	16.7	39.3	306	87.3
64	13	29	17.2	39.3	308	87.9
65	13	29	17.2	39.1	304	86.7
66	13	28	16.8	39.2	304	86.8
67	13	29	17.0	39.2	304	86.7
68	13	29	16.8	39.2	305	87.2
69	13	29	17.4	39.2	304	86.7
70	13	29	17.5	39.2	310	88.7
71	13	29	17.2	39.2	303	86.4
72	13	29	17.6	39.2	306	87.3
73	13	29	17.3	39.2	312	89.1
74	13	29	17.0	39.1	318	90.7
75	13	28	16.9	39.2	296	84.5
	Average	29	17.0	39.1	302	86.2
	Std Dev	0	0.3	0.1	9	2.6
	Maximum	29	17.6	39.3	318	90.7
	Minimum	28	16.6	38.8	281	80.4

N-value: 21

BN: 75 2-8-13

Sample Interval Time: 33.74 seconds.

Update Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation

D

APPENDIX

MOORE TWINING ASSOCIATES, INC.

Since 1898

UPDATED SURFACE-FAULT RUPTURE HAZARD, GEOTECHNICAL ENGINEERING, AND GEOLOGIC/SEISMIC HAZARD INVESTIGATION PROPOSED SEISMIC REHABILITATION OF SIX EXISTING BUILDINGS AND CONSTRUCTION OF A NEW MULTI-PURPOSE BUILDING SAN JUAN SCHOOL, 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA

Project Number: E83701.03

For:

Aromas San Juan Unified School District
2300 San Juan Highway
San Juan Bautista, California 95045

September 14, 2022

MOORE TWINING ASSOCIATES, INC.
Since 1898

September 14, 2022 E83701.03

Ms. Michelle Huntoon, Superintendent
Aromas San Juan Unified School District
2300 San Juan Highway
San Juan Bautista, California 95045

Subject: Updated Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation
Proposed Seismic Rehabilitation of Six Existing Buildings
And Construction of a New Multi-Purpose Building
San Juan School, 100 Nyland Drive
San Juan Bautista, California

Dear Ms. Huntoon:

We are pleased to submit this Updated Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard investigation report prepared for improvements proposed at San Juan School.

This report is an update to the previous report issued by Moore Twining entitled, "Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation, Proposed Seismic Rehabilitation of Six Existing Buildings and Construction of New Multi-Purpose Building, San Juan School, 100 Nyland Drive, San Juan Bautista, California," issued for the project on December 24, 2012. This update incorporates review for additional studies since the time of our previous work and this update incorporates data from supplemental cone penetration testing used to further evaluate potential seismic settlement. This report supersedes the December 24, 2012 report.

The contents of this report include the purpose of the investigation, scope of services, background information, investigative procedures, our findings, geotechnical evaluations, geologic and seismic hazard evaluations, conclusions, and recommendations.

We appreciate the opportunity to be of service to the Aromas-San Juan Unified School District. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience at (800) 268-7021.

Sincerely,

MOORE TWINING ASSOCIATES, INC.

Allen H. Harker

Allen H. Harker, PG
Professional Geologist

EXECUTIVE SUMMARY

This Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard investigation report was prepared for improvements proposed at San Juan School, located at 100 Nyland Drive in San Juan Bautista, California. The improvements include seismic upgrades to six (6) existing school buildings, and a new multi-purpose building.

San Juan School is located near the mapped trace of the San Andreas fault. The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California, as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act.

The purpose of our investigation was to provide geotechnical engineering parameters for use in design of foundations, slabs-on-grade, and preparation of related construction documents. The intent of the investigation was also to evaluate potential geologic/seismic hazards, including surface-fault rupture hazards.

The existing six buildings to be rehabilitated include five classrooms and an office constructed with precast tilt-up concrete shear walls with flexible floor and roof diaphragms. The buildings range from about 2,700 square feet to about 5,475 square feet in plan dimensions.

The project, comprising seismic upgrades to six (6) of the existing buildings and construction of a new multi-purpose building, is subject to the California Administrative Code CCR Title 1 Part 1 which states that no new school buildings shall be constructed, rehabilitated, reconstructed or relocated within 50 feet of the trace of an active fault (fault displacement having occurred within the last 11,000 years). Accordingly, a surface-fault rupture hazard investigation was conducted to assess the presence or absence of active fault splays as related to the seismic upgrades and proposed new multi-purpose building. The fault rupture hazard investigation was conducted in October and November 2012 and included review of fault hazard reports previously prepared by others for portions of the school site, excavating two (2) exploratory trenches (477 total feet of trench), exposing pre-Holocene soils, and assessing whether faulting (ground displacement) was exhibited in the soils exposed by the trenching. The surface-fault rupture hazard investigation report is included in Appendix E of this report and states: "*No active faults were documented in the trench exposures and the sediment layers, and continuous marker horizons provide positive evidence for the absence of fault offset. These findings, in conjunction with the findings of the previous investigations (D&M Consulting Engineers, Inc. 2002, and Cleary Consultants, Inc., 1987) indicate that the surface-fault rupture hazard within the proposed improvement area of the San Juan School site is low.*" The Fugro report in Appendix E also indicated the following: "*Assuming the base of the escarpment adjacent to the school (dashed red line on Figure 4) most closely represents the location of the primary trace of the San Andreas fault, the nearest walls of the closest buildings scheduled for rehabilitation (the northeast walls of buildings D and E) measure approximately 80 feet from the surface trace of the fault. However, common practice is to assume that the fault could lie just beyond the end of the closest trench. If we draw a line between the north ends of Trench A and Trench ET-2, neither of which encountered a fault, this line can be used as a conservative estimate of the nearest possible location of the trace of the San Andreas fault. Measured from this line, the northeast walls of buildings D and E are 55 feet away from the fault. Other project buildings (A, B, C, G and the multi-purpose building) are more than 240 feet away from the fault. Thus, all project buildings meet the State of California 50-foot setback requirement.*"

EXECUTIVE SUMMARY (continued)

The surface-fault rupture hazard investigation report also concludes that the potential for permanent ground deformation (tilting or folding) is considered low.

On November 21, 2012, ten (10) borings were drilled near the perimeters of the subject campus buildings, and at the location of the proposed new multi-purpose building. Borings B-1 and B-2 were drilled at the location of the proposed new multi-purpose building to depths of 21½ and 51½ feet below site grade (BSG) using a CME-75 drilling rig equipped with 6⅝-inch outside diameter (O.D.) hollow-stem augers. The remaining eight (8) borings were drilled near the perimeters of the subject existing buildings using a 4-inch diameter hand auger barrel and a 2-man power auger with 6-inch diameter auger. Auger refusal was encountered in all of the hand auger borings at depths of about 3½ to 5¼ feet BSG, due to soil layers with abundant gravels. In addition to the test borings, cone penetration testing (CPT) was performed at the site. On August 23, 2022, seven (7) CPT soundings were advanced to a depth of 50 feet BSG in areas surrounding buildings A, B, C, D, E, and G, where seismic upgrades are proposed, and also within the footprint of the proposed multi-purpose building.

The near surface soils encountered at the multi-purpose building location, at and directly below the anticipated foundation depths, comprised medium stiff fat clays with “medium” expansion potential. The near surface soil conditions encountered near the perimeters of the existing school buildings were predominantly clayey or silty sand fill soils which appeared to be medium dense. Silty sand with gravel, which appeared to be medium dense to dense, was the predominant native surface soil type encountered near the perimeters of the existing school buildings.

Groundwater was encountered at boring B-1 at a depth of 25 feet BSG during drilling and measured in the open borehole at 15 feet BSG about 2 hours after termination of drilling. Groundwater was encountered at boring B-2 at a depth of 14½ feet BSG during drilling.

The results of the analysis indicate the primary impact due to liquefaction is seismic settlement. In the area of the proposed multi-purpose building, the analysis from CPT-1 and CPT-2 indicates lower seismic settlements ranging from about to 1 inch to 1½ inches total and about ½ inch to ¾ inch differential in 30 feet. However, in the areas around the existing buildings to be seismically upgraded, the analysis from CPT-3 through CPT-7 indicates higher seismic settlements ranging from about 1¼ to 2½ inches total and about ⅝ inch to 1¼ inches differential in 30 feet.

The site is considered suitable for support of the proposed improvements relative to potential geologic hazards, provided the recommendations contained in this report are followed. From a geotechnical standpoint, the site is suitable for the proposed seismic upgrades and new multi-purpose building construction, provided the recommendations contained in the report are followed.

To reduce the potential for excessive differential static settlement, the new foundations for the multi-purpose building should be supported on compacted engineered fill prepared as recommended in this report.

EXECUTIVE SUMMARY (continued)

The near surface soils encountered are considered expansive. Mitigation measures due to expansive soils, such as placement of non-expansive import soils below new slabs-on-grade, are provided in the “Recommendations” section of this report.

Chemical testing of soil samples indicated the soils exhibit a “moderately corrosive” corrosion potential. Based on the laboratory testing for soluble sulfates in soil, the results indicate an exposure category S0 in accordance with Table 19.3.1.1 of ACI 318, with a low potential for sulfate attack on concrete.

This Executive Summary should not be used for design or construction and should be reviewed in conjunction with the attached report.

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UPDATED SURFACE-FAULT RUPTURE HAZARD, GEOTECHNICAL ENGINEERING, AND GEOLOGIC/SEISMIC HAZARD INVESTIGATION PROPOSED SEISMIC REHABILITATION OF SIX EXISTING BUILDINGS AND CONSTRUCTION OF A NEW MULTI-PURPOSE BUILDING SAN JUAN SCHOOL, 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA

Project No. E83701.01

1.0 INTRODUCTION

This update report presents the results of a surface-fault rupture hazard investigation, geotechnical engineering investigation, and geologic/seismic hazard investigation for improvements planned at San Juan School, located at 100 Nyland Drive, San Juan Bautista, California. The improvements include seismic upgrades to six (6) existing school buildings, and a new multi-purpose building. Moore Twining Associates, Inc. (Moore Twining) was authorized by written agreement with the Aromas-San Juan Unified School District to conduct the aforementioned investigations.

The contents of this report include the purpose of the investigation and the scope of services provided. The existing site features, site history, previous studies, and existing and anticipated construction are discussed. In addition, a description of the investigative procedures used and the subsequent findings are presented. Finally, the report provides geotechnical evaluations, geologic and seismic hazard evaluations, general conclusions, and related recommendations. The report appendices contain the drawings (Appendix A); the logs of borings and cone penetration tests (Appendix B); the results of laboratory tests (Appendix C); liquefaction and seismic settlement calculations (Appendix D), the fault hazard report prepared for this study titled "Surface-Fault Rupture Hazard Investigation" (Appendix E), two (2) fault investigation reports previously prepared by others for San Juan School (Appendix F), and photographs (Appendix G).

2.0 PURPOSE AND SCOPE OF INVESTIGATION

2.1 Purpose of Geotechnical Engineering and Geologic/Seismic Hazard Investigations: The purpose of our investigation was to provide geotechnical engineering recommendations for use in design and preparation of related construction documents. The intent of the investigation was also to evaluate potential geologic/seismic hazards, including surface-fault rupture hazards. The scope of the investigation presented in this report included conducting field exploration and a laboratory testing program, evaluating the data collected during the field exploration and laboratory testing portions of the investigation, and providing the following:

2.1.1 Geotechnical parameters for use in design of foundations and slabs on grade;

2.1.2 Recommendations for site preparation including placement, conditioning, and compaction of engineered fill soils;

2.1.3 Descriptions of potential geohazards in accordance with the requirements of the 2019 California Building Code and California Geological Survey Note 48;

2.1.4 Conclusions regarding the potential for liquefaction and magnitude of seismic settlement;

2.1.5 Conclusions regarding the potential for surface fault rupture and seismic induced surface deformation (tilting or folding);

2.1.6 Recommendations for 2019 California Building Code seismic coefficients and earthquake spectral response acceleration values;

2.1.7 Recommendations for temporary excavations and utility trench backfill; and

2.1.8 Conclusions regarding soil corrosion potential.

The proposed project will include seismic upgrades to six (6) of the existing school buildings and construction of a new multi-purpose building. In order to evaluate the California Administrative Code, CCR Title 1 Part 1 requirement which states that no new school buildings shall be constructed, rehabilitated, reconstructed or relocated within 50 feet of the trace of an active fault (fault displacement having occurred within the last 11,000 years), a surface-fault rupture hazard investigation was conducted to assess the presence or absence of active fault splays as related to the seismic upgrades and proposed new multi-purpose building. The fault rupture hazard investigation included excavating two (2) exploratory trenches (477 total feet of trench), exposing pre-Holocene soils, and assessing whether faulting (ground displacement) was exhibited in the soils exposed by the trenching. The fault trenching exploration was conducted under the review of the California Geological Survey (CGS), which included site observations and observations of the trenches. The results of the surface-fault rupture hazard investigation are summarized in the body of this report and the report, in its entirety, is contained in Appendix E of this report. In addition, Appendix F contains two (2) fault investigation reports previously prepared by others for San Juan School, which are referenced in the surface-fault rupture hazard investigation report.

This report is provided specifically for the proposed improvements described in the “Existing and Anticipated Construction” section of this report. This investigation did not include an environmental investigation, or an environmental audit.

2.2 **Scope:** Our proposal dated August 4, 2022 (MTP 22-0540), outlined the scope of this update report and our proposal dated September 6, 2012 (MTP 4112-0350) outlined the scope of the original investigation. The actions undertaken during the investigation are summarized as follows:

2.2.1 The Site Plan, Sheet A1.1, dated August 10, 2011, prepared by Kasavan Architects, was reviewed.

2.2.2 A visual site reconnaissance was conducted.

2.2.3 Aerial photographs, topographic maps, and Light Detection and Ranging (LiDAR) remote sensing data were reviewed.

2.2.4 A report titled: "Geotechnical Investigation, Proposed Kindergarten Building Addition, San Juan Elementary School...," prepared by D & M Consulting Engineers, Inc., dated November 27, 2002, was reviewed.

2.2.5 A report titled: "Geologic, Seismic and Fault Hazards Assessment Report, Proposed Kindergarten Building Addition, San Juan Elementary School...," prepared by D & M Consulting Engineers, Inc., dated November 12, 2002, was reviewed.

2.2.6 A report titled: "Fault Location Investigation, San Juan Junior High School Additions...," prepared by Cleary Consultants, Inc., dated April 30, 1987, was reviewed.

2.2.7 A report titled: "Geologic/Seismic Hazards Investigation, Proposed Relocatable Classrooms, San Juan School, 100 Nyland Drive, San Juan Bautista, California," dated April 29, 2020, prepared by Moore Twining Associates, Inc., Project No. E83701.02, was reviewed.

2.2.8 The previous report entitled, "Surface-Fault Rupture Hazard, Geotechnical Engineering, and Geologic/Seismic Hazard Investigation, Proposed Seismic Rehabilitation of Six Existing Buildings and Construction of New Multi-Purpose Building, San Juan School, 100 Nyland Drive, San Juan Bautista, California," dated December 24, 2012, prepared by Moore Twining Associates, Inc., Project No. E83701.01, was reviewed.

2.2.9 The Division of the State Architect (DSA) was contacted to obtain geotechnical and geologic documents pertinent to the site, and documents were reviewed at the DSA Oakland office.

2.2.10 Select available published geologic data and reports pertinent to the project, were reviewed and are cited in this report.

2.2.11 Subsurface explorations, including trenching, test borings and Cone Penetration Tests, were conducted.

2.2.12 Laboratory tests were conducted to determine selected physical and engineering properties of the subsurface soils.

2.2.13 The data obtained from the investigation were evaluated to develop an understanding of the subsurface soil conditions and engineering properties of the subsurface soils.

2.2.14 This report was prepared to present the purpose and scope, background information, field exploration procedures, findings, evaluation, conclusions, and recommendations.

3.0 BACKGROUND

The site history, previous studies, existing site features, and the anticipated construction are summarized in the following subsections.

3.1 Site Description: The project site is located at San Juan School, 100 Nyland Drive in San Juan Bautista, San Benito County, California. A site location map is presented on Drawing No. 1 in Appendix A. The site area is relatively flat with the elevation of the proposed new multi-purpose building area a few feet lower than the existing school buildings. According to the 7½ minute series topographic map (San Juan Bautista Quadrangle, 2012), produced by the United States Geological Survey (USGS), the average elevation of the site is roughly 205 feet above mean sea level and the site is located at roughly 36.8427 degrees latitude and -121.5316 degrees longitude.

The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California, in accordance with the Alquist-Priolo Earthquake Fault Zoning Act. According to the Special Studies Zone official map, San Juan Bautista Quadrangle, the existing school buildings to be seismically upgraded are located about 150 to 450 feet southwest of the trace of the active San Andreas Fault and the new multi-purpose building location is approximately 450 feet southwest of the trace of the fault. However, based on the mapped trace of the San Andreas Fault shown on Figure 4: Site Map Showing Fault Investigation Trenches from Fugro's "Fault Rupture Hazard Assessment for Seismic Rehabilitation and Multi-Purpose Building" (see Appendix E), the existing school buildings to be seismically upgraded are located more than 50 feet from the active San Andreas Fault and the new multi-purpose building location is approximately 410 feet southwest of the trace of the fault.

The visible exterior portions of the subject school buildings to be rehabilitated were observed on October 11, 2012 and on August 23, 2022. The exterior of the building walls observed appeared to be painted concrete. During our site reconnaissance, signs of distress indicative of excessive differential foundation movement were not observed in the exterior walls of the buildings, nor in the Portland cement concrete flatwork adjacent to the buildings.

The locations of the existing school buildings (Buildings A, B, C, D, E, and G), where seismic upgrades are proposed, and the proposed multi-purpose building are shown on Drawing No. 2. Buildings A, B, C, D, E, and G are single-story slab-on-grade structures ranging in plan dimensions from about 2,700 square feet to about 5,475 square feet in plan area.

The areas adjacent to buildings A, B, C, D, E, and G include unimproved ground (soil covered), landscape vegetated, and Portland cement concrete walkways. The area of the proposed multi-purpose building was covered with an asphalt concrete play court. Paint marks on the asphalt concrete play court indicate that an electric line and communications line cross below the southwestern portion of the proposed multi-purpose building. The new building site is bound to the northwest by a grass covered play ground; to the northeast by existing classrooms (subject buildings); to the southeast by a parking lot and Nyland Drive beyond; and the southwest by a gymnasium building and grass covered fields. Photographs of the existing campus are included as photograph Nos. 1 through 6, in Appendix G of this report.

3.2 **<u>Site History</u>:** It is our understanding that the school campus was originally constructed in about 1968. Prior to construction of the existing school, it is our understanding that the area of the existing school campus was primarily utilized for agricultural purposes or was vacant open land.

3.3 **<u>Previous Studies</u>:** A geotechnical investigation report, prepared by D&M Consulting Engineers, Inc., for a kindergarten building addition, dated November 27, 2002, was obtained from DSA through a records request. The report included a geologic and seismic hazard study and was prepared for design of the existing 1,400 square foot kindergarten building addition. Four (4) test borings were drilled to depths of 5 to 41½ feet BSG. The report describes the soils encountered as stiff to very stiff medium plastic lean clay underlain by medium dense to dense silty sands at depths of about 6 to 7 feet, with underlying stiff clay, silty and clayey sand deposits.

The report states:

> *Groundwater was first encountered at a depth of 28 feet below the ground surface at the time of our exploratory drilling (October 2002). With the use of rotary wash (mud rotary) drill techniques, we were unable to determine a stabilized depth to groundwater.*

> *The site was found to have a low potential for liquefaction related hazards due to the relatively dense alluvium and the age of the alluvium encountered beneath the design groundwater level.*
>
> *The potential for lateral spreading is low based on our finding that the liquefaction potential is low.*
>
> *The hazard due to the proposed improvements as a result of landsliding is considered to be negligible.*
>
> *There is a low hazard associated with expansive soils.*
>
> *The Kindergarten Building Addition site is outside the 100-year flood inundation zone but may experience flooding of less than one-foot in depth with a 100-year event.*

The report recommended: *"footings be on and should be placed neat against undisturbed native soils and/or engineered fill. Continuous footings should be reinforced with at least two Number 4 steel reinforcing bars at the top and bottom to provide structural continuity and permit spanning of local irregularities in soil conditions exposed at the base of the footing excavations. The footings should be embedded a minimum of 24 inches below pad grade or lowest adjacent finished grade, whichever provides a deeper embedment for perimeter strip foundations and exterior columns, and at least 18 inches below pad grade (top of pad prior to placement of the sand and gravel section discussed below in Section 4.5.2) for interior footings... Footings may be designed for a net allowable bearing pressure of 2,500 pounds per square foot due to dead plus live loads, with a one-third increase when including transient loads such as seismic or wind."*

Based on our discussions with Mr. Bill Rupert, and our review of documents at DSA Oakland office, it is our understanding that no other geotechnical engineering reports prepared for San Juan School are available. It should be noted that the surface-fault rupture hazard investigation report (Appendix E) references two (2) previous fault investigation reports conducted by others for the San Juan school. If other reports become available, these reports should be provided for our review and consideration for this project.

A report entitled: "Geologic/Seismic Hazards Investigation, Proposed Relocatable Classrooms, San Juan School, 100 Nyland Drive, San Juan Bautista, California," dated April 29, 2020, prepared by Moore Twining Associates, Inc., Project No. E83701.02, was reviewed. This report was prepared for classrooms planned to the north of the existing buildings planned to be rehabilitated (See Drawing No. 2 in Appendix A for general location). The report included subsurface exploration via soil borings and an update of the surface fault rupture hazard investigation conducted by our firm in 2012. The report was approved by CGS in their letter, "Second Engineering Geology and Seismology Review for San Juan School - New Portable Classrooms, 100 Nyland Drive, San Juan Bautista, CA, CGS Application No. 01-CGS4441, DSA Application No. 01-119007," dated July 20, 2020.

The report for the relocatable classrooms indicated that two (2) borings (B-1 and B-2) were drilled at the classroom site to depths of 50 and 16½ feet below site grades (BSG) on April 3, 2020. The soils encountered in these borings were described as follows: *"The near surface soils encountered at the classroom site comprised clayey sand fill soil extending to a depth of about 3 feet in both borings. In boring B-1, loose to dense native silty sands were encountered below the fill soils, and extended to a depth of 28½ feet BSG. The silty sands were underlain by stiff to very stiff sandy lean clay extending to a depth of 38½ feet BSG. The sandy lean clay was underlain by medium dense to very dense silty sand, which extended to 50 feet BSG, the maximum depth explored. In boring B-2, medium dense clayey sands were encountered below the fill soils, and extended to a depth of about 4½ feet BSG. The clayey sands were underlain by medium dense silty sands extending to a depth of 16½ feet BSG, the maximum depth explored in boring B-2."*

Groundwater encountered in the borings was described in the report as follows: *"During our April 3, 2020 exploration, groundwater was encountered at the classroom site in borings B-1 and B-2 at depths of 13½ and 16 feet BSG, respectively. The depth of groundwater measured through the augers after drilling boring B-1 was 11 feet BSG."*

The liquefaction analysis in the report was described as follows: *"The results of the analyses indicates that liquefaction would occur as a result of the design level seismic event in silty sands at depths between about 13 and 19 feet BSG. The results of the analysis indicate a total seismic settlement of about 2 inches. A differential seismic settlement of about 1 inch in 30 feet is estimated."*

3.4 <u>Existing and Anticipated Construction</u>: The anticipated improvements include seismic rehabilitation of six (6) existing buildings (denoted as buildings A, B, C, D, E, and G) and construction of a new multi-purpose building. The existing six buildings to be rehabilitated include five classrooms and an office constructed with precast tilt-up concrete shear walls with flexible floor and roof diaphragms. Photographs of the existing campus buildings are included as photograph Nos. 1 through 6 in Appendix G of this report. The buildings range from about 2,700 square feet to about 5,475 square feet in plan area. It is our understanding the existing building foundations are comprised of approximate four foot square and two foot deep footings at the ends of each wall panel. It is also our understanding that the buildings have no perimeter foundations between the isolated footings.

It is our understanding that plans for the seismic upgrades have not been developed, but the rehabilitation tentatively includes new perimeter grade beams connecting isolated spread footings located. A maximum seismic load of 4 kips per foot was assumed as possible vertical loading on the grade beams.

It is also our understanding that the multi-purpose building is proposed to be approximately 8,000 square feet in plan area, and the construction type for the building has not been determined. For the purpose of this report, it is anticipated that the new multi-purpose building will include structural steel or wood framing systems or CMU walls and shallow spread foundations, and a concrete slab-on-grade floor. Maximum static loads for column (if any) and continuous foundations of 70 kips and 4 kips per foot, respectively, were assumed. In the event the actual design loads for the multi-purpose building vary from those assumed, these loads should be provided to Moore Twining for review prior to final design. Photographs of the proposed location of the multi-purpose building (existing asphaltic concrete playcourt) are included as photograph Nos. 5 and 6 in Appendix G of this report.

Appurtenant construction is anticipated to include concrete flatwork, underground utilities and landscaping. Basements and retaining walls are not anticipated for this project.

Grading plans were not available at the time this report was prepared. However, given the relatively flat nature of the site, it is anticipated that cuts and fills of up to about one foot may be required to achieve the proposed site grades for the multi-purpose building.

4.0 INVESTIGATIVE PROCEDURES

The field exploration and laboratory testing program conducted for the geotechnical and geologic seismic hazard investigations are summarized in the following subsections.

4.1 Field Exploration: The field exploration for the geotechnical/geological hazards portion of the project consisted of a site reconnaissance, drilling test borings, soil sampling, standard penetration tests and Cone Penetration Testing. In addition, fault trenching was conducted to evaluate surface fault rupture hazards. Details of the investigative procedures for the Surface-Fault Rupture Hazard investigation are included in Appendix E of this report.

4.1.1 Site Reconnaissance: The site reconnaissance consisted of walking the site and noting visible surface features. The reconnaissance was conducted by Moore Twining engineering geologist on various dates in 2012 and on August 23, 2022. The features noted are described in the "Background" and "Visible Surface Indicators of Potential Surface Fault Rupture" sections of this report.

4.1.2 <u>Drilling Test Borings</u>: The approximate locations of the test borings and the depths of the borings were selected based on the type of construction, the depth of influence of anticipated foundation loads, equipment access considerations, and subsurface soil conditions.

On November 21, 2012, ten (10) borings were drilled near the perimeters of the subject campus buildings, and at the location of the proposed new multi-purpose building. Borings B-1 and B-2 were drilled at the location of the proposed new multi-purpose building to depths of 21½ and 51½ feet BSG using a CME-75 drilling rig equipped with 6⅝-inch outside diameter (O.D.) hollow-stem augers. Eight (8) shallow borings were drilled near the perimeters of the subject existing buildings using a 4-inch diameter hand auger and a 2-man, power auger with a 6-inch diameter. Auger refusal was encountered in all of the hand auger borings at depths of about 3½ to 5¼ feet BSG due to soil layers with abundant gravel. The approximate locations of the borings are depicted on Drawing No. 2 in Appendix A of this report.

The soils encountered in the test borings were logged by a geologist or engineer. The field soil classification was in accordance with the Unified Soil Classification System and consisted of particle size, color, and other distinguishing features of the soil.

The presence and elevation of free water, if any, in the borings were noted and recorded during drilling and immediately following completion of the test borings.

Test boring locations were determined by tape measurement with reference to the existing site features. The locations, as described, should be considered accurate to within about 5 feet.

4.1.3 <u>Backfilling of Test Borings and Fault Exploration Trenches</u>: The boreholes (approximately 4 to 7 inches in diameter) were loosely backfilled with materials excavated during the drilling operations. Due to the loose nature of the test boring backfill, some settlement of the backfill should be anticipated. The fault exploration trenches (Trench A and Trench B) were backfilled with the excavated soils. Soils were moisture conditioned, then placed into the trenches and spread to approximate 8 inch thick lifts and compacted using a backhoe-mounted sheep's foot wheel compactor. The results of compaction testing conducted by our firm indicate that the trenches were backfilled with soils compacted to at least 90 percent of the maximum relative compaction per ASTM D1557.

4.1.4 <u>Hand Excavated Pit</u>: A shallow pit was hand excavated adjacent to the perimeter of Building D, at the northeast corner of the building, in an attempt to expose the building foundation. The approximate location of the pit is shown on Drawing No. 2, Appendix A.

4.1.5 Soil Sampling: During drilling of the hollow-stem auger borings, standard penetration tests were conducted, and both disturbed and relatively undisturbed soil samples were obtained.

The standard penetration resistance, N-value, is defined as the number of blows required to drive a standard split barrel sampler into the soil. The standard split barrel sampler has a 2-inch O.D. and a 1⅜ inch inside diameter (I.D.). The sampler is driven by a 140-pound weight free falling 30 inches. The sampler is lowered to the bottom of the bore hole and set by driving it an initial 6 inches. It is then driven an additional 12 inches, or portion thereof, and the number of blows required to advance the sampler an additional 12 inches, or portion thereof, is recorded as the N-value.

Relatively undisturbed soil samples for laboratory tests were obtained by pushing or driving a California modified split barrel ring sampler into the soil. The soil was retained in brass rings, 2.5 inches O.D. and 1-inch in height. The lower 6-inch portion of the samples were placed in close-fitting, plastic, airtight containers which, in turn, were placed in cushioned boxes for transport to the laboratory. Soil samples obtained were taken to Moore Twining's laboratory for classification and testing. In addition, bulk samples of soil were obtained for laboratory testing.

4.2 Laboratory Testing: The laboratory testing was programmed to determine selected physical and engineering properties of the soils sampled and tested. The tests were conducted on disturbed and relatively undisturbed samples considered representative of the subsurface materials encountered.

The results of laboratory tests on samples obtained from the test borings are summarized on the figures in Appendix C. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

4.3 Cone Penetration Test (CPT) Soundings: In addition to the test borings, cone penetration testing (CPT) was performed at the site. On August 23, 2022, seven (7) CPT soundings were advanced to a depth of 50 feet BSG in areas surrounding buildings A, B, C, D, E, and G, where seismic upgrades are proposed, and within the footprint of the proposed multi-purpose building. CPT methods were used to obtain nearly continuous soil behavior type and penetration resistance information for use in evaluating liquefaction potential. The approximate CPT locations are shown on Drawing No. 2 in Appendix A.

The CPT soundings were performed by Middle Earth Geo Testing, Inc., using an electronic piezocone with a 60-degree apex angle and a diameter of 35.7 millimeters (about 1½ inches) hydraulically advanced using a 30-ton CPT rig in accordance with ASTM Test Method D3441. CPT measurements of cone bearing resistance, sleeve friction, and dynamic pore water pressure were recorded at 2 inch intervals during penetration to provide nearly continuous logs of the soil behavior types. The CPT logs are presented in Appendix B.

5.0 FINDINGS AND RESULTS

The findings and results of the field exploration and laboratory testing are summarized in the following subsections.

5.1 Visible Surface Indicators of Potential Surface Fault Rupture: Aerial photographs and LiDAR data were reviewed as part of the surface-fault rupture hazard investigation (see report Appendix E). The surface-fault rupture hazard investigation report indicates geomorphic indicators suggestive of active faulting were not noted on, or adjacent to, the school site in the areas investigated. Signs of distress indicative of excessive differential foundation movement or fault displacement were not observed in the exterior walls of the buildings, nor in the Portland cement concrete exterior flatwork adjacent to the buildings.

5.2 General Geologic Conditions: The site is located near the western margin of the San Juan Valley. Based on our review of several geologic maps including the Preliminary Geologic Map of the San Juan Bautista Quadrangle, San Benito and Monterey Counties, California (Dibblee, Nilsen, and Brabb, 1979), the site is underlain by Quaternary alluvium. The Geologic Map of California, Santa Cruz Sheet (third printing, 1971), indicates the site area is underlain by Quaternary terrace deposits (see Drawing No. 3). According to Division of Mines Bulletin 133, Geology of the San Juan Bautista Quadrangle, California (Allen, 1946), the site area is mapped as Quaternary (Upper Pleistocene) terrace deposits, and cross sections indicate that the terrace deposits are underlain by San Juan Bautista Formation (later termed the San Lorenzo formation by Dibblee et al., 1979) described as *"as much as 1,500 feet of poorly bedded, fine-grained, fossiliferous, argillaceous and calcareous sandstones, carbonaceous grits often containing numerous wood fragments, and shales."* The cross sections also indicate that the San Juan Bautista Formation is underlain by Santa Lucia Quartz Diorite. Based on our review of published geologic information, review of the aforementioned Geologic, Seismic and Fault Hazards Assessment Report prepared by D&M Consulting, Inc. (2002), and our test boring B-1 drilled at in the multi-purpose building area, the alluvium at the campus extends deeper than 51½ feet below site grade. A site geologic map and soil profile cross section are is presented as Drawing Nos. 4 and 5, Appendix A.

5.3 Soil Profile: The following is a general summary of the soil conditions encountered in the borings drilled for this investigation. Detailed descriptions of the soils encountered at each location are presented on the logs of borings and Cone Penetration Test (CPT) soundings in Appendix B. The stratification lines shown on the logs represent the approximate boundary between soil types; the actual in-situ transition may be gradual. The soil behavior types identified by the CPT soundings generally conformed to the soils encountered at the boring locations.

Multi-Purpose Building: Asphaltic concrete, about 4 inches thick, was encountered at the surface at borings B-1 and B-2, which was underlain by about 3½ to 4 inches of aggregate base. In general, the near surface soils in the area of the proposed new multi-purpose building (borings B-1 and B-2) comprised fat clays extending from below the aggregate base section to about 4½ to 5 feet BSG.

Silty and clayey sands were encountered below the near surface fat clays, extending to depths of about 8½ to 10 feet BSG. The soils below a depth of about 10 feet BSG were lean clays and clayey sands interbedded with layers of poorly graded sand with silt that extended to the maximum depth explored of 51½ feet BSG.

Existing School Buildings: The near surface soil conditions encountered in the areas of the existing school buildings included fill soils, which were underlain by native soils that varied from the native soils encountered at the location of the multi-purpose building. Near surface soils revealed in hand auger borings HA-1 through HA-8, drilled near the perimeters of the existing buildings, comprised clayey or silty sand fill soils. The fill soils were identified in seven (7) of the eight (8) borings, extending from the ground surface to depths of less than 1 foot to about 3½ feet BSG. Fill soils were not encountered in hand auger boring HA-2. In most of the borings, the near surface soils were underlain by native silty sand with gravel that extended to the maximum depth explored of about 5¼ feet BSG. In the remainder of the borings, the near surface soils were underlain by native clayey sands or sandy lean clays with gravel. Auger refusal was encountered in all of the hand auger borings at depths of about 3½ to 5¼ feet BSG due to soil layers with abundant gravel.

5.4 Soil Engineering Properties: The following is a description of the soil engineering properties as determined from our field exploration and laboratory testing.

Multi-Purpose Building: The near surface fat clay soils in the area of the proposed new multi-purpose building (borings B-1 and B-2) were described as medium stiff, as determined by standard penetration resistance, N-values, ranging from 6 to 7 blows per foot. Testing of one (1) fat clay soil sample revealed a moisture content of 21.5 percent. An expansion index test performed on one sample indicated a “medium” expansion index of 72. A consolidation test conducted on the near surface fat clays indicated about 9.6 percent consolidation under a load of 16 kips per square foot and a swell of about 0.7 percent at a load of 500 pounds per square foot.

Below the fat clay soils, the silty sands and poorly graded sand with silt were described as medium dense, as determined by standard penetration resistance, N-values, ranging from 14 to 16 blows per foot. These soils had a trace of fine gravel. Testing revealed that the sandy soils were non-plastic with a moisture content of about 5 percent.

Loose to medium dense clayey sands (N-values of 6 to 26 blows per foot) were encountered below the fat clays and silty sands and poorly graded sands. Test results indicate these soils have about 22 to 42 percent fines (passing the #200 screen). The results of a direct shear test indicate an angle of internal friction of 34 degrees with a cohesion of 410 pounds per square foot. These soils also had a trace of fine to coarse gravel.

Lean clays were encountered below the silty sands and poorly graded sands, at depths below 10 and 20 feet BSG. The lean clays were described as soft to very stiff, as determined by standard penetration resistance, N-values, of 2 to 16 blows per foot. These soils had a trace of fine gravel. Testing of the lean clay samples revealed moisture contents of about 16 to 19 percent.

Poorly graded sands with silt were encountered below a depth of 40 feet BSG, extending to the maximum depth explored of 51½ feet BSG. The poorly graded sands with silt were described as dense to very dense, as determined by standard penetration resistance, N-values, of 31 to 63 blows per foot. Testing revealed that the soils had a moisture content of about 14 percent.

Existing School Buildings: The clayey and silty sand fill soils encountered near the perimeters of the existing school buildings appeared to be medium dense. Testing of the clayey and silty sand samples revealed moisture contents of about 7 to 13 percent.

The native silty sand with gravel and clayey sands or sandy lean clays with gravel encountered below the fill soils appeared to be very dense or very stiff. The native soils were described as damp or moist and testing of the native soil samples revealed moisture contents of about 4 to 15 percent. An expansion index test performed on one sample of clayey sand indicated a “low” expansion index of 41, and an Atterberg limits test result indicated a plasticity index of 24 with a liquid limit value of 41.

Corrosion Tests: Chemical testing of two (2) near surface soil samples collected from the proposed new building area and the area of the existing buildings indicated pH values of 8.4 and 8.3, with minimum resistivity values of 5,000 and 6,100 ohms-centimeter, respectively. The test results also indicated “none-detected” (<0.00060 percent by weight) concentrations of chloride in the samples and 0.0029 and 0.00073 percent by weight concentrations of sulfate for the samples collected from the new building area and the area of the existing buildings, respectively.

5.5 Groundwater Conditions: Groundwater was encountered in various test borings. At boring B-1 (multi-purpose building), groundwater was encountered at 25 feet BSG during drilling and measured in the open borehole at 15 feet BSG about 2 hours after termination of drilling. At boring B-2 (multi-purpose building), groundwater was encountered at 14½ feet BSG during drilling and measured in the open borehole at 14 feet BSG after termination of drilling. Groundwater was also encountered seeping into the bottom of fault exploration Trench A. A few inches of water ponded in the bottom of the trench, within about 10 feet of the northeast end. It is estimated that the elevation of the ponded water in Trench A corresponds to a depth of about 15 feet below the ground surface at the proposed location of the multi-purpose building.

In the CPT soundings, groundwater was encountered in the CPT-1 and CPT-2 (multi-purpose building area) at a depth of about 19 feet BSG as measured with a tape measure following completion of each CPT sounding and prior to backfilling. CPT-3 through CPT-7 (around the existing buildings to receive seismic upgrades) encountered groundwater at depths ranging from about 19 feet to 28 feet BSG. The CPT holes were backfilled after the groundwater measurements were made and were not kept open to obtain stabilized groundwater readings.

During our April 3, 2020 exploration, groundwater was encountered at the relocatable classroom site (refer to Drawing No. 2 in Appendix A) in borings B-1 and B-2 at depths of 13½ and 16 feet BSG, respectively. The depth of groundwater measured through the augers after drilling boring B-1 was 11 feet BSG.

Groundwater was encountered at a depth of 28 feet below the ground surface during the 2002 geologic/seismic and fault hazards assessment for the kindergarten building assessment (D&M Consulting Engineers, Inc.).

The site is located along the western margin of the San Juan Valley, about 1,300 feet northeast of the range front. The rise of the water levels within the test borings indicates that the groundwater is under a semi-confined condition in the sand units, and the clayey units are acting as aquitards.

Based on our review of well data from the California Department of Water Resources website, a well located about ¼ mile southeast of San Juan School indicates groundwater has ranged from about 10 feet in April 2017 to about 47 feet in November 2016 for data collected between the years 2011 and 2022. The most recent measurement from this well in April 2022 indicated a groundwater depth of about 29 feet BSG.

Considering the depth to groundwater noted in Trench A and the water level depths measured in borings B-1 and B-2 of about 14 feet, and groundwater data from a well near the school site, a high groundwater table depth of 10 feet BSG was estimated for this project.

It should be recognized, that water table elevations fluctuate with time, since they are dependent upon seasonal precipitation, irrigation, land use, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered both during the construction phase and the design life of the project. The evaluation of such factors was beyond the scope of this investigation and report.

5.6 Results of Hand-Excavated Pit: A hand-excavated pit was excavated adjacent to the northeast corner of the perimeter of Building D (see Drawing No. 2 in Appendix A for pit location). The pit revealed a 7-inch thick concrete slab at a depth of about 8 inches below site grade, adjacent to the wall and pilaster. The slab extended out about 24 inches from the wall, or about 17 inches out from the edge of the corner pilaster. A gravelly sand or base rock material was located under the slab. Due to the buried slab, we could not excavate deep enough to expose the adjacent building foundation.

6.0 GEOTECHNICAL EVALUATIONS

The data and methodology used to develop conclusions and recommendations for project design and preparation of construction specifications are summarized in the following subsections. The evaluation was based upon the subsurface soil conditions encountered during this investigation and our understanding of the proposed construction. The conclusions obtained from the results of our evaluations are described in the Conclusions section of this report.

6.1 Subsurface Conditions: The primary geotechnical engineering concerns for design and construction of the proposed project are: 1) the expansive nature of the near surface soils; 2) the potential for wet, unstable soils to be encountered during earthwork, 3) the potential for liquefaction and seismic settlements discussed in Section 7.4.3 of this report, and 4) the special attention that should be given to temporary excavations and foundation monitoring where new foundations or grade beams are excavated at the existing school buildings.

6.2 Expansive Soils: One of the potential geotechnical hazards evaluated is the expansion potential of the near surface soils. Over time, expansive soils will experience cyclic drying and wetting as the dry and wet seasons pass. Expansive soils experience volumetric changes (shrink/swell) as the moisture content of the clayey soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade when not designed for the anticipated expansive soil pressures. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction. The potential for damage to slabs-on-grade and foundations supported on expansive soils can be reduced by placing non-expansive fill below slabs-on-grade and extending perimeter foundations or thickened slab edges continuously to a sufficient depth where moisture changes are limited.

In evaluation of the expansive soils potential at the site, expansion index testing was performed on representative samples of the near surface soils which are anticipated to be within the zone of influence of the planned improvements. The expansion tests were performed in accordance with ASTM D4829 and the result is summarized in Appendix C of this report. The result of expansion index tests indicated that the near surface fat and lean clay soils and clayey sands have medium to low expansion potential, with expansion index values of 72 and 41, respectively. The near surface soils encountered in the area of the proposed multi-purpose building had a higher expansion potential than the near surface soils encountered in the area of the existing school buildings.

Based on the expansion potential of the near surface soils, this report recommends support of new slabs-on-grade on an imported, non-expansive fill to reduce the potential for excessive heave of slabs on grade. Chemical treatment (i.e., lime treatment) of the on-site soils could also be evaluated for use as a potential non-expansive fill below the slabs-on-grade. However, laboratory suitability testing, including compressive strength determinations, etc. would be required. In addition to placement of a non-expansive fill below slabs on grade, continuous thickened edges or perimeter foundations should be included in the building design to form a moisture cutoff as recommended in this report.

6.3 **Wet Weather Conditions and Unstable Soils:** Due to the fine grained nature of the soils, stabilization of the bottom of excavations may be necessary due to high soil moisture conditions. Thus, special stabilization measures (i.e., placement of geotextile fabric and rock, chemical treatment, etc.) should be anticipated during earthwork for these conditions. It should be noted that stabilization by placement of geotextile fabric and rock will require additional excavation be conducted below the over-excavation depths recommended in this report.

6.4 **Temporary Excavations and Foundation Monitoring**: Special attention should be given to temporary excavations and foundation monitoring where new foundations or grade beams are excavated at the existing school buildings to be seismically upgraded. Depending on the depth of existing foundations and/or improvements to be removed, and the depth of new foundations, temporary excavations adjacent to the existing adjacent foundation systems or utilities may require shoring or temporary underpinning of existing foundations. Excavations for the new construction should not be conducted below a 1.5(H) to1(V) line extending from the bottom of the existing foundations, slabs-on-grade, etc. unless those portions of the structure adjacent to the excavation are underpinned, shored or if the excavations are conducted in limited widths (i.e., slots) adjacent to existing foundations. Excavations too close to existing slabs and foundations could undermine foundation support and damage the existing buildings. Existing improvements, foundations, etc. within influence of the construction, such as temporary excavations, should be monitored by level surveys.

It is recommended the existing buildings and improvements be inspected prior to and after construction of the seismic upgrades, and any cracks and related distress should be repaired prior to completion of the project.

6.5 Static Settlements and Bearing Capacity of Shallow Foundations: The potential for excessive total and differential static settlement of foundations and slabs-on-grade was evaluated for the proposed structure based on the assumed foundation loads noted in the "Existing and Anticipated Construction" section of this report. The increases in effective stress to underlying soils which can occur from new foundations and structures, placement of fill, withdrawal of groundwater, etc. can cause vertical deformation of the soils, which can result in damage to the overlying structures and improvements. The differential component of the settlement is often the most damaging. In addition, the allowable bearing pressures of the soils supporting the foundations should be evaluated for shear and punching type failure of the soils resulting from the imposed foundation loads.

Based on our evaluations, the near surface soils will not provide adequate direct support for foundations and slabs-on-grade for the proposed multi-purpose building due to the potential for excessive differential settlement. Based on the results of our evaluations, recommendations for compaction / preparation of the building pad subgrade (multi-purpose building) is included in the "Recommendations" section of this report to limit static settlements to 1 inch total and ½ inch differential in 30 feet by support of foundations on engineered fill. The static settlements for the multi-purpose building are based upon a net allowable soil bearing pressure of 2,500 pounds per square foot, for dead-plus-live loads, with a one-third increase for transient loads such as wind or seismic.

The net allowable soil bearing pressure is the additional contact pressure at the base of the foundations caused by the structure. The weight of the soil backfill and weight of the footing may be neglected. The net allowable soil bearing pressure presented was selected to satisfy both the static settlement criteria and Terzaghi bearing capacity equations for spread foundations. A factor of safety of 3.0 was used to determine the allowable bearing capacity based on Terzaghi equations. Schmertmann's method was used to estimate foundation settlements. If the actual maximum loads differ from those assumed in the "Existing and Anticipated Construction" section of this report, these loads should be provided to Moore Twining to evaluate the anticipated settlements.

6.6 Soil Corrosion: The risk of corrosion of construction materials relates to the potential for soil-induced chemical reaction. Corrosion is a naturally occurring process whereby the surface of a metallic structure is oxidized or reduced to a corrosion product such as iron oxide (i.e., rust). The metallic surface is attacked through the migration of ions and loses its original strength by the thinning of the member.

Soils make up a complex environment for potential metallic corrosion. The corrosion potential of a soil depends on numerous factors including soil resistivity, texture, acidity, field moisture and chemical concentrations. In order to evaluate the potential for corrosion of metallic objects in contact with the onsite soils, chemical testing of soil samples was performed by Moore Twining as part of this report. The test results are included in Appendix C of this report. Conclusions regarding the corrosion potential of the soils tested are included in the Conclusions section of this report based on the National Association of Corrosion Engineers (NACE) corrosion severity ratings listed in Table No. 1, below.

Table No. 1

Soil Resistivity (ohm cm)	Corrosion Potential Rating
>20,000	Essentially non-corrosive
10,000 - 20,000	Mildly corrosive
5,000 - 10,000	Moderately corrosive
3,000 - 5,000	Corrosive
1,000 - 3,000	Highly corrosive
<1,000	Extremely corrosive

The results of soil sample analyses indicate for samples tested in the area of the proposed modular building that the near-surface soils exhibit a “moderately corrosive” corrosion potential to buried metal objects. Appropriate corrosion protection should be provided for buried improvements based on the “moderately corrosive” corrosion potential of the soils tested. If piping or concrete are placed in contact with imported soils, these soils should be analyzed to evaluate the corrosion potential of these soils.

The soil corrosion data should be provided to the manufacturers or suppliers of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturers or suppliers cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e., a corrosion engineer, with experience in corrosion protection should be consulted to provide design parameters. Moore Twining does not provide corrosion engineering services.

6.7 **<u>Sulfate Attack of Concrete</u>:** Degradation of concrete in contact with soils due to sulfate attack involves complex physical and chemical processes. When sulfate attack occurs, these processes can reduce the durability of concrete by altering the chemical and microstructural nature of the cement paste. Sulfate attack is dependent on a variety of conditions including concrete quality, exposure to sulfates in soil, groundwater and environmental factors. The standard practice for geotechnical engineers in evaluation of the soils anticipated to be in contact with structural concrete is to perform laboratory testing to determine the concentrations of sulfates present in the soils. The test results are then compared with the exposure classes in Table 19.3.1.1 of ACI 318 to provide guidelines for concrete exposed to soils containing sulfates. It should be noted that other exposure conditions such as the presence of: seawater, groundwater with elevated concentrations of dissolved sulfates, or materials other than soils can result in sulfate exposure categories to concrete that are higher than the concentrations of sulfate in soil. The design engineer will need to determine whether other potential sources of sulfate exposure need to be considered other than exposure to sulfates in soil. The sulfate exposure classes for soils from Table 19.3.1.1 are summarized in the below table.

Table No. 2
ACI Exposure Categories for Water Soluble Sulfate in Soils

Sulfate Exposure Class (per ACI 318)	Water Soluble Sulfate in Soil (Percent by Mass)
S0	Less than 0.10 Percent
S1	0.10 to Less than 0.20 Percent
S2	0.20 to Less than or Equal to 2.00 Percent
S3	Greater than 2.00 Percent

Common methods used to resist the potential for degradation of concrete due to sulfate attack from soils include, but are not limited to the use of sulfate-resisting cements, air-entrainment and reduced water to cement ratios. The laboratory test results for sulfates are included in Appendix C of this report. Conclusions regarding the sulfate test results are included in the Conclusions section of this report.

7.0 GEOLOGIC AND SEISMIC HAZARDS EVALUATION

7.1 General Geologic Conditions: The general geologic conditions are discussed in section 5.2 of this report.

7.2 Tectonics and Seismicity: Numerous active and potentially active faults are located in the site region and contribute to the design seismic ground motion estimates. An "active fault" is defined, for the purpose of this evaluation, as a fault that has had surface displacement within Holocene time (about the last 11,000 years). A widely accepted definition of a potentially active is a fault showing evidence of displacement older than 11,000 years and younger than 1.6 million years (Pleistocene). Faults showing evidence of displacement older than 1.6 million years are usually classified as "inactive."

Major active faults occur to the east, west, south, and north of the project site. The majority of the San Juan School site is located in an Earthquake Fault Zone designated by the State of California as prescribed by the Alquist-Priolo Earthquake Fault Zoning Act. According to the Special Studies Zone official map, the mapped trace of the San Andreas Fault Zone is located about 150 feet northeast of the easternmost school buildings. The Fugro report in Appendix E indicated the following: *"Assuming the base of the escarpment adjacent to the school (dashed red line on Figure 4) most closely represents the location of the primary trace of the San Andreas fault, the nearest walls of the closest buildings scheduled for rehabilitation (the northeast walls of buildings D and E) measure approximately 80 feet from the surface trace of the fault. However, common practice is to assume that the fault could lie just beyond the end of the closest trench. If we draw a line between the north ends of Trench A and Trench ET-2, neither of which encountered a fault, this line can be used as a conservative estimate of the nearest possible location of the trace of the San Andreas fault. Measured from this line, the northeast walls of buildings D and E are 55 feet away from the fault. Other project buildings (A, B, C, G and the multi-purpose building) are more than 240 feet away from the fault. Thus, all project buildings meet the State of California 50-foot setback requirement."*

Numerous other active and potentially active faults also occur in the site region. The Zayante-Vergeles is located about 3 miles southwest of the site, and the Calaveras fault is located about 7 miles east of the site. The location of the San Juan School site, relative to known nearby fault systems within about 20 to 40 miles, is depicted on Drawing No. 6 in Appendix A of this report.

Based on the results of deaggregation of the 2,475 year return period event (2 percent probability of exceedance in 50 years) using the United State Geological Survey deaggregation website (https://earthquake.usgs.gov/hazards/interactive/), Dynamic Conterminous U.S. 2014 Edition (update, v4.2.0); the San Andreas fault is the predominant contributing source of seismicity for the site area.

The following subsections briefly describe the major fault systems contributing to the seismic ground motion estimates for the site area. Historic seismicity and seismic design parameters are described in sections 7.4.2.1 and 7.4.2.2 of this report, respectively.

7.2.1 San Andreas Fault: The mapped trace of the San Andreas fault is located less than 0.1 miles (0.16 kilometers) east of the San Juan School campus. The San Andreas Fault zone defines the boundary between the North American and Pacific earth tectonic plates and accommodates most of the horizontal strike-slip motion between the plates. A portion of the school campus is located on a fault-parallel ridge and a prominent linear escarpment is located roughly 80 feet northeast of the existing campus buildings (as noted in the Surface-Fault Rupture Hazard Investigation report in Appendix E of this report). The base of the escarpment coincides with the mapped trace of the San Andreas fault. The fault-parallel ridge may be a result of compressional tectonics occurring near the fault (see the Surface-Fault Rupture Hazard Investigation report, Appendix E).

The San Andreas fault is associated with two of the largest earthquakes that have occurred in California during historic time: the 1857 Fort Tejon earthquake (magnitude 8.3) which occurred in southeast Monterey County (near Parkfield) and the 1906 San Francisco earthquake (magnitude 8.3) which occurred near San Francisco. Due in part to the length of the fault, approximately 625 miles (1,000 kilometers), various portions (segments) of the San Andreas Fault can be characterized by distinctly different seismic behavior related to rupture location, length, and expected repeat time (Wallace, 1970; Allen, 1968; Sieh and Jahns, 1984). San Juan Bautista lies near the south end of the Santa Cruz Mountains segment and the north end of the creeping segment, which extends about 60 miles to the southeast. Within the creeping section of the San Andreas fault, the fault slips aseismically and produces numerous small earthquakes (mostly M=5 and smaller), but no large ones (http://earthquake.usgs.gov/research/parkfield/geology.php).

Earthquakes occurring on various segments of the San Andreas Fault near the site, and combinations of segments rupturing during a single event have been assigned magnitudes ranging from 6.2 to 7.9 and slip rates of 0.06 to 34 mm/yr (Cao et al., 2003).

7.2.2 **<u>Zayante-Vergeles Fault</u>**: The Zayante-Vergeles is a major right-lateral reverse-oblique-slip fault with late Pleistocene and possibly Holocene displacement located about 2.7 miles southwest of the site. The fault is a major northwest structural element of the Santa Cruz Mountains, likely accommodates tectonic displacement at the bend near the San Andreas fault zone, and has a complex junction with the San Andreas fault about 4½ miles southeast of Hollister. The Zayante-Vergeles fault has been assigned a magnitude of 7.0 and a slip rate of 0.1 mm/yr (Cao et al., 2003).

7.2.3 **<u>Calaveras Fault</u>**: The Calaveras Fault is considered active over a distance of more than 80 miles from Danville on the north to Hollister on the south. Tectonic creep also occurs episodically along the fault, mainly from Coyote Lake to Hollister.

Seismic activity along the Calaveras Fault (M6.2) in the vicinity of Morgan Hill has been felt in the central San Joaquin Valley as recently as April 1984.

It is estimated that the surface trace of the Calaveras Fault lies about 7 miles east of the site. Several segments located within about 11 miles of the site are assigned magnitudes of 5.73 to 6.93, with slip rates ranging from 11 to 15 mm/yr (Cao et al., 2003).

7.2.4 **<u>Rinconada Fault</u>**: The Rinconada fault and related faults constitute a major structural element known regionally as the Salinas Valley. The fault extends about 140 miles from near King City southeast to the Big Pine Fault. It is estimated that the surface trace of the Rinconada fault lies about 17 miles southwest of the site. The Rinconada fault has been assigned a magnitude of 7.5 and a slip rate of 1.0 mm/yr (Cao et al., 2003).

7.2.5 **Monterey Bay- Tularcitos Fault Zone**: The Monterey Bay-Tularcitos fault zone is located about 24½ miles southwest of the site. The Monterey Bay-Tularcitos fault zone is a complex zone of northwest-striking high-angle faults up to 15 km wide, which includes several active (Holocene) and potentially active (Quaternary) faults. The Monterey Bay-Tularcitos fault zone has been assigned a magnitude of 7.3 and a slip rate of 0.5 mm/yr (Cao et al., 2003).

7.2.6 **Ortigalita Fault**: The Ortigalita fault zone, located about 26 miles northeast of the site, is a major Holocene right-lateral strike slip fault (eastern part of the San Andreas fault system). The fault extends from about 12 miles northwest of the San Luis Reservoir southeast to the vicinity of Panoche Valley. The Ortigalita fault zone is characterized by en echelon fault traces separated by pull-apart basins. The Ortigalita fault has been assigned a magnitude of 7.1 and a slip rate of 1.0 mm/yr (Cao et al., 2003).

7.3 **Geologic Hazards:** The potential geologic hazards of landslides and conditional geologic hazards are described in the following subsections.

7.3.1 **Landslides**: The site is relatively flat. A satellite image of the site from online sources shows some small earthflows along a hillside located more than 750 feet southwest from the school. The closest two earthflows along this hillside are approximately 1,600 feet southwest of the proposed multi-purpose building at the San Juan School site. The toe of this hillside is over 1,000 feet southwest of the proposed multi-purpose building at the San Juan School site. Due to the distance from the toe of this slope to the school site, and the relatively flat relief of the school site, landslide hazard is considered low.

7.3.2 **Conditional Geologic Hazards:** Conditional geologic hazards, as identified in Section 31 of California Geological Survey Note 48 are discussed in the following subsections.

7.3.2.1 **Hazardous Materials:** Hazardous materials such as hydrogen-sulfide gas, methane and tar seeps are not known to be present in the project area and are not considered to be a concern at the subject site.

7.3.2.2 **Volcanic Activity:** California includes six volcanic regions that include volcanoes that have erupted within the last 100,000 years and are considered potential volcanic hazard sources (Miller, 1989). The subject site is not located in any of these six volcanic regions and the closest areas of Quaternary volcanism are the Mono Lake- Long Valley and Clear Lake areas located about 140 miles north and 150 miles east of the site. Considering no known areas of Quaternary volcanism are present within 100 miles of the site, the prospect for lava flows or significant ash falls at the site during the design life of the development is considered low.

7.3.2.3 Flooding: Based on the Flood Insurance Rate Map, Community Panel number 06069C0158D, revised on April 16 2009, distributed by the Federal Emergency Management Agency, the existing school buildings A, B, C, D, E, and G and the majority of the proposed location for the multi-purpose building are located in Zone X. According to the Flood Insurance Rate Map Zone X is defined as areas outside the 0.2 percent annual chance flood plain. A portion of the northwest corner of the location for the multi-purpose building appears to be near or within "Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood. The Safety Element of the San Juan Bautista General Plan states: *"During a 100 year storm, the Salinas Grade tributary to San Juan Creek could flood Alameda Plaza, San Juan Inn, part of the School, and homes along The Alameda south of 156."*

The California Department of Water Resources, Division of Safety of Dams website (https://fmds.water.ca.gov/maps/damim/) was reviewed for potential inundation at the site from breaches of dams in the surrounding area. The site is not located inside any inundation zones for catastrophic failure of a nearby dam.

According to the San Benito County General Plan Update, August 19, 2010: *"San Benito County could be affected by dam failure inundation from a few, relatively small dams and reservoirs, including the San Justo Reservoir located three miles southwest of Hollister and the Leroy Anderson Dam, which is located in Santa Clara County but has a dam inundation zone that covers a part of San Benito County."* The Safety Element of the San Juan Bautista General Plan does not identify any dams that would pose an inundation hazard to the school site.

7.3.2.4 Seiches and Tsunamis: A seiche is a wave generated by the periodic oscillation of a body of water whose period is a function of the resonant characteristics of the containing basin as controlled by its physical dimensions. These periods generally range from a few minutes to an hour or more. The site is not near any large bodies of water, so seiches are not considered a significant hazard at the site.

Tsunamis are waves generated in oceans from seismic activity. Due to the inland location of the site, tsunamis are not considered a significant hazard for the site.

7.3.2.5 Radon Gas: Our review of a database maintained by the California Department of Public Health (CDPH) Radon Program on the California Geological Survey website (https://www.conservation.ca.gov/cgs/minerals/mineral-hazards/radon), was reviewed for California Indoor Radon Levels Sorted by Zip Code, last updated February 2016. Based on the zip code for the site (95045), one (1) of the three (3) measurements indicated 4 picocuries per liter or higher. However, based on our previous review of this database during preparation of our previous December 24, 2012 report, when the database was last updated May 4, 2010, the database indicated only 1 of 27 radon tests reported a level of radon gas exceeding 4 picocuries per liter. The U.S. EPA recommends that individuals avoid long-term exposures to radon concentrations above 4 picocuries per liter. Based on our review of the geologic conditions at the site and the referenced data reported by the DHS, the potential for radon gas levels in buildings constructed at the site to exceed 4 picocuries per liter is low.

7.3.2.6 Naturally Occurring Asbestos: Asbestos occurs in soil and rock naturally in certain geologic settings in California. Review of the referenced Open-File Report 2000-19, titled *A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos*, prepared by State of California Department of Conservation, Division of Mines and Geology, dated August, 2000, does not indicate the occurrence of ultramafic rock within 10 miles of the subject site. Ultramafic rocks were not observed on the site, in test borings, trenches, etc. and are not common to the geologic environment of the site. Based on the cited literature and our site observations, it is our opinion that the potential to encounter naturally occurring asbestos containing rock in the near surface soil and rock materials at the site is low.

7.3.2.7 Hydrocollapse: As a part of this investigation consolidation tests were conducted. One (1) consolidation test was conducted on a relatively undisturbed sample of the near surface clay soils. Collapse was not indicated in the sample as the sample indicated free swell when wetted under a load of 500 pounds per square foot. Given these results, the recommendations for preparation of the site, and the geologic nature of the subsurface materials, hydrocollapse is not considered a significant concern for this project.

7.3.2.8 Regional Subsidence: Based on our review of an online map published by the California Water Science Center, the site is not located in an area of recorded subsidence (see https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html). The site region is not subject to regional subsidence, thus, subsidence is not a concern for the project.

7.4 SEISMIC HAZARDS: The potential for fault ground rupture, seismic groundshaking and seismic coefficients/earthquake spectral response acceleration design values, and liquefaction and seismic settlement are described in the following subsections.

7.4.1 Active Faulting and Surface Fault Rupture: Earthquakes are caused by the sudden displacement of earth along faults with a consequent release of stored strain energy. The fault slippage can often extend to the ground surface where it manifests in abrupt relative ground displacement across a rupture surface. Damage resulting directly from fault rupture ground displacement occurs only where structures are located astride a rupture surface with relative displacement.

The locations of active and potentially active faults in the site region were established based on our review of the on-line 2010 Fault Activity Map of California: California Geological Survey, Geologic Data Map No. 6 (Jennings and Bryant), the U.S.G.S. Quaternary fault database, and the Special Studies Zone official map, San Juan Bautista Quadrangle.

The school campus is located in an Alquist-Priolo Earthquake Fault Zone associated with the San Andreas fault zone. The mapped trace of the San Andreas fault is located less than 0.1 miles (0.16 kilometers) east of the San Juan School campus. Accordingly, Moore Twining contracted with Fugro Consultants, Inc. geologists to assist with the surface fault rupture hazard investigation and prepare a surface-fault rupture hazard investigation update report (contained in Appendix E of this report). The fault trenching exploration was conducted under the review of the California Geological Survey (CGS), which included site observations and observations of the trenches by CGS reviewers. The Surface-Fault Rupture Hazard Investigation report (Appendix E of this report) states: *"No active faults were documented in Trench A and B exposures. The sediment layers, and continuous marker horizons provide positive evidence for the absence of fault offset. These findings, in conjunction with the findings of the previous investigations (D&M Consulting Engineers, Inc. 2002, and Cleary Consultants, Inc., 1987) indicate that the surface-fault rupture hazard within the proposed improvement area of the San Juan School site is low."* The surface-fault rupture hazard investigation report also concludes that the potential for permanent ground deformation (tilting or folding) is considered low. Photographs of the fault investigation trenches are shown in Appendix G of this report (Photograph Nos. 7 through 17).

7.4.2 Ground Shaking: For any given earthquake, the rock in the immediate vicinity will respond with a certain maximum acceleration and with a predominant period that depends on the nature of the rock and the source mechanism. Away from the focus of the earthquake, the ground motions begin to attenuate. The way in which the earthquake wave is altered depends to a great degree on source characteristics and to a lesser degree on the travel path.

A summary of our review of historic seismic activity relative to the site is included below.

7.4.2.1 Historic Seismic Activity: As with the seismically active California region, the general area of the site has historically experienced recurring seismic activity. Based on historical earthquake data obtained from the U.S. Geological Survey's earthquake database system, approximately 140 historical earthquakes with magnitude 4.5 or greater have been recorded from 1900 through August 29, 2022 within a 50 mile radius of the site. A map showing the location of the project site with relation to the approximate historical earthquake epicenter locations and magnitude category is presented on Drawing No. 7 in Appendix A of this report.

The nearest earthquake event (estimated magnitude = 4.5) found during the search occurred on March 28, 1948, approximately 2⅓ miles southeast of the site. The largest magnitude earthquake identified in the 50 mile radius search was the 6.9 magnitude Loma Prieta earthquake which occurred on October 18, 1989, approximately 24 miles northwest of the site.

Other historical earthquakes are worth noting based on a larger radius within 100 miles of the site such as the 8.25 magnitude Great Earthquake of San Francisco which occurred on April 18, 1906, approximately 80 miles northwest of the site.

Several large earthquakes occurred near San Juan Bautista during the 1800's. Toppozada et al. describe numerous earthquakes of likely greater than magnitude 6.0 in the San Juan Bautista region occurring during 1840 and 1841 "one of the most seismically active historical periods in the San Juan Bautista vicinity". Toppozada suggests that the high seismicity was aftershock activity occurring near the rupture end of the 1838 earthquake (approximate M=7.0 earthquake with 60 km rupture length extending north of the Loma Prieta rupture). A number of earthquakes of magnitude 5.0 or greater also occurred within about 12 miles of San Juan Bautista between 1883 and 1910.

7.4.2.2 Seismic Design Parameters: It is our understanding that the 2019 California Building Code (CBC) will be used for structural design, and that seismic site coefficients are needed for design.

Based on the 2019 CBC, a Site Class D was assigned for the on-site soil conditions with standard penetration resistance, N-values, averaging between 15 and 50 blows per foot in the upper 100 feet below site grade.

A Maximum Considered Earthquake (geometric mean) peak ground acceleration adjusted for site effects (PGA_M) of 1.046g was determined for the site using the Ground Motion Parameter Calculator provided by SEOAC and OSHPD (http://seismicmaps.org).

7.4.3 Liquefaction and Seismic Settlement: Liquefaction and seismic settlement are conditions that can occur under seismic shaking from earthquake events. Liquefaction describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movements of the soil mass, combined with loss of bearing usually results. Fine, well sorted, loose sand, shallow groundwater conditions, higher intensity earthquakes, and particularly long duration of ground shaking are the requisite conditions for liquefaction.

The subject site is located in an area that has **not** been mapped by the California Geological Survey for liquefaction hazards. However, due to the high ground acceleration at the site, liquefaction and seismic settlement analyses were conducted based on soil properties revealed by Cone Penetration Test (CPT) soundings that were conducted within the footprint of the proposed multi-purpose building (CPT-1 and CPT-2) and also around the buildings to be seismically upgraded (CPT-3 through CPT-7). Soil parameters, such as wet unit weight, N-value, fines content, and depth of N-value tests, were input for the soil layers encountered throughout the depths explored (see test boring logs, Appendix B). The analyses were conducted using the computer program LIQUEFYPRO by Civiltech. The analysis used a peak horizontal ground acceleration, PGA_M, of 1.046g, a maximum considered earthquake magnitude of 7.08 based on deaggregation analysis (United States Geological Survey deaggregation website https://earthquake.usgs.gov/hazards/interactive/), Dynamic Conterminous U.S. 2014 Edition (update) (v4.2.0), and a groundwater depth of 10 feet BSG. The seismic settlement estimates assumed negligible settlement in the dense to very dense soils (Qc1f values of greater than 160 atmospheres) above the groundwater.

The results of the analysis indicate that some of the thin sand and the sand to silty sand layers identified in the CPTs are susceptible to liquefaction. Due to the limited thickness of the liquefiable layers, surface manifestation of liquefaction, such as sand boils, etc. are not anticipated. In addition, based on the corrected blow counts (N-values) of the shallower liquefiable layers and relatively flat ground surface conditions, lateral spreading is not considered a significant impact. Thus, the primary impact due to liquefaction for structure design is anticipated to be seismic settlement. In the area of the proposed multi-purpose building, the analysis from CPT-1 and CPT-2 indicates seismic settlements ranging from about to 1 inch to 1½ inches total and about ½ inch to ¾ inch differential in 30 feet. However, in the areas around the existing buildings to be seismically upgraded, the analysis from CPT-3 through CPT-7 indicates higher seismic settlements ranging from about 1¼ to 2½ inches total and about ⅝ inch to 1¼ inches differential in 30 feet. The seismic settlement analyses are included in Appendix D.

A seismic settlement of ¾ inches differential in 30 feet is recommended for design of the multi-purpose building. Meanwhile, the rehabilitation design for existing buildings A, B, C, D, E, and G should consider the seismic settlements of 2½ inches total and 1¼ inches differential in 30 feet that were estimated from Cone Penetration Test soundings CPT-3 through CPT-7 conducted around the existing buildings to be seismically upgraded.

8.0 CONCLUSIONS

Based on the data collected during the field exploration and laboratory testing program, our geotechnical experience in the vicinity of the project site, and our understanding of the anticipated construction, the following general conclusions are presented.

8.1 The site is considered suitable for support of the proposed improvements relative to geotechnical and geologic hazards, provided the recommendations contained in this report are followed. It should be noted that the recommended design consultation and construction monitoring by Moore Twining are integral to this conclusion.

8.2 The near surface soils encountered at the multi-purpose building location comprised medium stiff fat clays with a "medium" expansion potential. The near surface soil conditions encountered around the existing school buildings to be rehabilitated were predominantly clayey or silty sand fill soils which appeared to be medium dense.

8.3 In 2012, groundwater was encountered in boring B-1 (multi-purpose building) at 25 feet BSG during drilling and measured in the open borehole at 15 feet BSG about 2 hours after termination of drilling. At boring B-2 (multi-purpose building), groundwater was encountered at 14½ feet BSG during drilling and measured in the open borehole at 14 feet BSG about 15 minutes later, after termination of drilling. A few inches of water ponded in the bottom of the fault exploration Trench A, at the northeast end. It is estimated that the elevation of the ponded water in Trench A corresponds to a depth of about 15 feet below the ground surface at the proposed location of the multi-purpose building. Groundwater was encountered in the CPT soundings in 2022 at depths ranging from about 19 to 28 feet BSG. Based on our review of well data from the California Department of Water Resources website, a well located about ¼ mile southeast of San Juan School indicates groundwater has ranged from about 10 feet in April 2017 to about 47 feet in November 2016 for data collected between the years 2011 and 2022. The most recent measurement from this well in April 2022 indicated a groundwater depth of about 29 feet BSG. As a result of the groundwater data reviewed for this investigation, an historic high groundwater depth of 10 feet BSG was used for the liquefaction analysis.

8.4 The results of the analysis indicate that liquefaction would generally occur in some thin sand and the sand to silty sand layers. Due to the thickness of non-liquefiable soils over the liquefiable layer, surface manifestation of liquefaction, such as sand boils, etc. is not anticipated. Thus, the primary impact due to liquefaction is seismic settlement. The seismic settlement estimates assumed negligible settlement in the dense to very dense soils (Qc1f values of greater than 160 atmospheres) above the groundwater. In the area of the proposed multi-purpose building, the analysis from CPT-1 and CPT-2 indicates seismic settlements ranging from about 1 inch to 1½ inches total and about ½ inch to ¾ inch differential in 30 feet. However, in the areas around the existing buildings to be seismically upgraded, the analysis from CPT-3 through CPT-7 indicates higher seismic settlements ranging from about 1¼ to 2½ inches total and about ⅝ inch to 1¼ inches differential in 30 feet. Tabular results of the liquefaction and seismic settlement analyses (spreadsheet) are included in Appendix D.

8.5 The surface-fault rupture hazard investigation report (see report in Appendix E) indicates geomorphic indicators suggestive of active faulting were not noted on or adjacent to the school site in the areas investigated. The surface-fault rupture hazard investigation report indicates the potential for fault rupture on the site is considered low, and the project meets the 50-foot setback requirement from the San Andreas Fault. It should be noted the previous version of this surface-fault rupture hazard investigation report was approved by CGS as part of their review of the referenced July 20, 2020 geohazard report prepared by Moore Twining for the relocatable classroom buildings project.

8.6 The near surface native fat clays encountered at the location of the proposed multi-purpose building exhibited high compressibility characteristics. Settlement analyses for these soils indicate that new foundations should be supported on engineered fill to reduce the potential for excessive static settlement. New foundations supported on engineered fill placed and compacted as recommended in this report should be designed for static total and differential settlements of 1 inch and ½ inch in 40 feet, respectively, and for seismic total and differential settlements of 1 inch and ½ inch in 30 feet, respectively. A net allowable static soil bearing pressure of 2,500 pounds per square foot (for dead-plus-live loads) may be used for design, with a one-third increase for transient loads such as wind or seismic.

8.7 The near surface fill and native clayey sand and silty sand soils encountered at the locations of the seismic rehabilitation appeared medium dense to very dense. Grade beams or continuous foundations used for the seismic rehabilitation may be supported directly on the native or fill soils. New foundations for the seismic rehabilitation (if any) should be designed for static total and differential settlements of 1 inch and ½ inch in 40 feet, respectively, and seismic total and differential settlements of 2½ inches and 1¼ inches in 30 feet, respectively. A net allowable soil bearing pressure of 2,500 pounds per square foot (for dead-plus-live loads), may be used for design, with a one-third increase for transient loads such as wind or seismic.

8.8 The near surface soils encountered are considered expansive. Mitigation measures due to the expansive soils conditions are provided in the "Recommendations" section of this report.

8.9 The potential for hazards due to landslides, flooding, volcanic activity, seiches, and tsunamis at the site is considered low. However, there is potential for strong shaking from earthquakes due to the close proximity of the San Andreas Fault, and engineering designs should consider the potential for this strong shaking.

8.10 Chemical testing of soil samples indicated the soils exhibit a "moderately corrosive" corrosion potential.

8.11 Based on the laboratory testing for soluble sulfates in soil, the results indicate an exposure category S0 in accordance with Table 19.3.1.1 of ACI 318, with a low potential for sulfate attack on concrete.

9.0 RECOMMENDATIONS

Based on the evaluation of the field and laboratory data and our geotechnical experience in the vicinity of the project, we present the following recommendations for use in the project design and construction. However, this report should be considered in its entirety. When applying the recommendations for design, the background information, procedures used, findings, evaluation, and conclusions should be considered. The Contractor should be required to comply with the recommendations included in this report. The recommended design consultation and observation of clearing, demolition activities and earthwork operations by Moore Twining are integral to the proper application of the recommendations.

9.1 General

9.1.1 If proposed foundation loading or the planned construction is different from that described in the "Existing and Anticipated Construction" section of this report, the recommendations in this report may not be appropriate. Moore Twining should be notified and requested to provide supplemental recommendations for the proposed construction if changes are planned.

9.1.2 A preconstruction meeting including, as a minimum, the owner, architect, general Contractor, contractor's surveyor, earthwork, foundation subcontractors, and Moore Twining should be scheduled by the general Contractor at least one week prior to the start of clearing and grubbing. The purpose of the meeting should be to discuss critical project issues, concerns and scheduling.

9.1.3 If any city, county, and/or state standards are cited on the plans or specifications, these standards should be in addition to the recommendations in this report.

9.1.4 The Contractor should be requested to include in the base bid the costs to perform the work required by this report, and the project plans and specifications, whichever is most stringent. After review of the aforementioned documents, the contractor(s) bidding on this project should determine if the data are sufficient for accurate bid purposes. If the data are not sufficient, the Contractor should conduct, or retain a qualified geotechnical engineer to conduct, supplemental studies and collect more data as required to prepare accurate bids.

9.1.5 All wells encountered which are to be removed should be abandoned per state and local requirements. The contractor should obtain an abandonment permit from the local environmental health department, and issue certificates of destruction to the owner upon completion.

9.1.6 Existing adjacent facilities should be protected from damage including but not limited to existing slabs-on-grade, pavements, utilities, buildings, etc.

9.1.7 A demolition plan should be prepared to identify existing improvements such as flatwork, underground utilities, etc. that are to be demolished and removed as part of the project.

9.1.8 Appropriate equipment such as low-pressure equipment, steel tracks, etc. should be used to achieve the required over-excavation, compaction and subgrade stabilization to minimize rutting and subgrade instability.

9.1.9 It may be possible to consider chemical treatment (i.e., lime treatment) of the on-site soils as an alternative to the use of imported non-expansive fill below slabs on grade to reduce the thickness of the imported, granular non-expansive materials recommended below slabs-on-grade in this report. However, lime suitability testing would need to be conducted in order to determine if the on-site clay soils are suitable for lime treatment for this use. If lime suitability testing is desired, Moore Twining can develop an estimate for conducting lime suitability/mix design testing (i.e., plasticity index, lime optimization testing, compressive strength testing, etc.). The lime suitability/mix design testing typically takes approximately 3 weeks for sample preparation and testing.

9.2 Site Grading and Drainage

9.2.1 It is critical to develop and maintain site grades which will drain surface and roof runoff away from foundations and floor slabs - both during and after construction. Adjacent exterior finished grades should be sloped a minimum of two (2) percent for a distance of at least ten (10) feet away from the structure, or as necessary to preclude ponding of water adjacent to foundations, whichever is more stringent. Adjacent exterior grades which are paved should be sloped at least 1 percent away from the foundations.

9.2.2 Surface grades should be designed so that surface water drains positively away from the building foundations. Surface water must not be allowed to pond adjacent to the building foundations. To reduce the potential for negative drainage, it is recommended to provide rain gutters and direct all water from roof drains into closed conduits that are connected to an acceptable discharge area away from the building foundation, upon an impervious surface that will direct water away into a storm drain, or directly into the site storm drain system.

9.2.3 It is recommended that landscaped, planted areas, etc. not be placed directly adjacent to the building foundations. Trees should be setback from proposed structures at least 10 feet or a distance equal to the anticipated drip line radius of the mature tree. For example, if a tree has an anticipated drip-line diameter of 30 feet, the tree should be planted at least 15 feet away (radius) from proposed or existing buildings.

9.2.4 Landscape and planter areas should be irrigated using low flow irrigation (such as drip, bubblers or mist type emitters). The use of plants with minimal water requirements are recommended.

9.2.5 In the event subsurface storm water infiltration or treatment systems, bioswales or similar designs are planned, the proposed locations and details of these features should be provided to Moore Twining for review and comment. If these types of features are required, sufficient setbacks to existing improvements should be maintained, and/or specific measures such as deepened curbs, cutoffs, liners, etc. should be incorporated in the designs to reduce the potential for excessive settlement of improvements due to moisture and freewater migration from storm water systems.

9.3 Site Preparation

9.3.1 All topsoil, vegetation, organics, and debris should be removed from all areas of the planned improvements. The general depth of stripping should be sufficiently deep to remove all root systems and soils with organic contents of more than 3 percent by dry weight. The surface organic cover should not be disced into the soils. For estimating purposes, a minimum stripping depth of 6 inches should be used for landscape grass areas. The actual depth of stripping should be reviewed by Moore Twining at the time of construction. It is possible that deeper stripping may be required if any roots larger than ¼-inch are encountered during grading and in localized areas, such as low areas where water may pond, or at locations of previously existing trees. Stripping should extend laterally a minimum of 5 feet outside the limits of the new improvements (i.e., proposed buildings, slabs-on-grade, pavements, etc.), or to the edges of flatwork to remain. The organic-rich materials will not be suitable for use as engineered fill; however, stripped topsoil may be stockpiled and reused in landscape areas at the discretion of the owner and upon approval by the project architect and landscape architect.

9.3.2 Existing surface and subsurface improvements located within the limits of the proposed construction should be removed and backfilled with engineered fill. This removal includes the surface asphaltic concrete and underlying base rock at the multi-purpose building location as well as underground utilities. Utilities should be completely removed and disposed of off-site and should not be crushed and buried in-place. In addition, all trench backfill soils and materials should be removed and the excavations backfilled with engineered fill. Improvements such as utilities or subsurface structures encountered during grading which are not scheduled to remain should be removed in their entirety and all loose backfill should be over-excavated and backfilled as engineered fill. Prior to backfill, the bottom of the excavation should be scarified to a depth of 8 inches, moisture conditioned to slightly above optimum moisture content and compacted as engineered fill.

9.3.3 Following stripping and removal of surface and subsurface improvements, the area of the **multi-purpose building and adjacent flatwork** should be over-excavated to a minimum depth of 12 inches below the bottom of existing improvements to be removed, to a minimum of 2 feet below preconstruction site grades, to a minimum of 2 feet below the bottom of the floor slab, to a depth of 1 foot below proposed foundations, or to the depth required to remove undocumented fills (if any encountered), whichever is greater.

The zone of the over-excavation should include the entire building pad preparation limits defined as the building footprint and extending laterally a minimum of five (5) feet beyond the building foundations, and 3 feet beyond adjacent proposed walkways, whichever is greater. Slot cutting only below foundations will not be allowed. Upon approval of the over-excavation limits by Moore Twining based on review of the survey data provided by the Contractor, the soils at the bottom of the excavation should be scarified to a minimum depth of 8 inches, moisture conditioned to within 1 to 4 percent over optimum moisture content and compacted as engineered fill. The resulting excavation should be backfilled to finished grades with engineered fill. The limits of over-excavation for the buildings should be shown on the project plans.

9.3.4 Following stripping and removal of surface and subsurface improvements, areas under, and within 2 feet laterally of new or replacement concrete door stoops or walkways located along the perimeters of the existing buildings where seismic rehabilitation occurs should be over-excavated to a minimum depth of 12 inches below the bottom of the new slab, 12 inches below existing improvements to be removed, whichever is greater. Imported, non-expansive fill soils are recommended below new or replacement concrete door stoops or walkways located along the perimeters of the existing buildings.

9.3.5 Following stripping and removal of surface and subsurface improvements, areas to receive exterior slabs outside the building pad preparation limits, should be over-excavated to a depth of 12 inches below the existing improvements to be removed, to the bottom of the imported, non-expansive fill section, to 12 inches below preconstruction site grades, or to the depth required to remove existing undocumented fills (if any), whichever is greater. The zone of over-excavation should extend laterally a minimum of 3 feet outside the exterior slabs. The bottom of the excavation should be scarified to a minimum depth of 8 inches, moisture conditioned to within 1 to 4 percent over optimum moisture content and compacted as engineered fill. The resulting excavation should be backfilled to finished grades with engineered fill.

9.3.6 Following stripping and removal of surface and subsurface improvements, areas of new asphalt concrete play courts should be over-excavated to a depth of 12 inches below the existing improvements to be removed, to the bottom of the aggregate base section, to a depth of 12 inches below preconstruction site grades, or to the depth required to remove existing improvements or undocumented fills, whichever is greater. The zone of over-excavation should extend laterally a minimum of 3 feet outside the perimeters of new pavements. The bottom of the excavation should be scarified to a minimum depth of 8 inches, moisture-conditioned to with 1 to 4 percent over optimum moisture content, and compacted as engineered fill. The resulting excavation should be backfilled to finished grades with engineered fill.

9.3.7 It is recommended that extra care be taken by the Contractor to ensure that the horizontal and vertical extent of the over-excavation and compaction conform to the site preparation recommendations presented in this report. Moore Twining is not responsible for surveying the horizontal or vertical extent of over-excavation and compaction. The Contractor should verify in writing to the owner that the horizontal and vertical over-excavation limits were completed in conformance with the recommendations of this report, the project plans, and the specifications (the most stringent applies) based on surveyed data. It is recommended this verification should be performed by a licensed surveyor including a plan showing the horizontal limits of the over-excavation and cross-sectional profiles showing the vertical extent of the over-excavation for each building pad. The licensed surveyor should indicate in writing that the over-excavation elevation and extent complied with this report. The verification should be provided prior to excavating for the foundations.

9.3.8 All fill required to bring the site to final grades should be placed as engineered fill. In addition, all native soils over-excavated should be compacted as engineered fill.

9.3.9 The moisture content and density of the compacted soils should be maintained until the placement of the imported non-expansive fill, aggregate base, vapor retarder and concrete slabs. If soft or unstable soils are encountered during excavation or compaction operations, our firm should be notified so the soils conditions can be examined and additional recommendations provided to address the pliant areas.

9.3.10 The Contractor is responsible for the disposal of concrete, asphaltic concrete, soil, spoils, etc. that must be exported from the site. Individuals, facilities, agencies, etc. may require analytical testing and other assessments of these materials to determine if these materials are acceptable for the intended use by the receiving party. The Contractor is responsible to perform the tests, assessments, etc. to determine the appropriate method of disposal. In addition, the Contractor is responsible for all costs to dispose of these materials in a legal manner.

9.4 Engineered Fill

9.4.1 The on-site near surface soils encountered in the area of the proposed multi-purpose building were fat clay soils. These soils are not considered suitable for use as engineered fill within the upper 24 inches below new concrete slabs-on-grade within the new building pad limits (i.e. interior building slabs and all concrete walkways adjacent to the buildings). These soils are also not considered suitable within the upper 12 inches below new concrete slabs-on-grade outside the building pad limits. Engineered fill within the upper 24 inches below new concrete slabs-on-grade within the building pad limits (which includes the interior building slab and adjacent walkways) should consist of 6 inches of aggregate base over 18 inches of imported, granular fill in accordance with sections 9.4.3 and 9.4.4 of this report. Engineered fill within the upper 12 inches below exterior slabs on grade (outside the building pad preparation limits) should consist of 4 inches of aggregate base over 8 inches of imported, granular fill in accordance with sections 9.4.3 and 9.4.4 of this report. In addition, new asphalt concrete playcourts should be underlain by at least 4 inches of aggregate base.

The on-site near surface soils encountered in the area of the existing buildings were predominantly a mixture of silty sands, clayey sands and sandy lean clay soils. In the area along the perimeters of the **existing buildings** where seismic rehabilitation occurs, the native soils are not considered suitable for use as engineered fill within the upper 12 inches below new or replacement concrete door stoops or walkways, nor within 2 feet laterally of edges of these improvements. Four (4) inches of aggregate base over eight (8) inches of imported non-expansive fill soils (see sections 9.4.3 and 9.4.4 of this report) are recommended below new or replacement concrete door stoops or walkways along the perimeters of the existing buildings.

Near surface native soils that are free of debris, roots greater than ¼ inch in diameter, particles greater than 3 inches in diameter, and debris, are considered suitable for use as engineered fill material below the imported, granular fill (and aggregate base underlying new playcourts), provided they are aerated or moisture conditioned in accordance with the recommendations of this report. If soils other than those considered in this report are encountered, Moore Twining should be notified to provide alternate recommendations.

9.4.2 The compactability of the native soils is dependent upon the moisture contents, subgrade conditions, degree of mixing, type of equipment, as well as other factors. The evaluation of such factors was beyond the scope of this report; therefore, they should be evaluated by the Contractor during preparation of bids and construction of the project.

9.4.3 Imported fill soil should be non-contaminated, non-corrosive, non-expansive and granular in nature and contain enough fine-grained material (binder) to allow cutting "neat" footing trenches with all of the following acceptance criteria recommended

Percent Passing 3-Inch Sieve	100
Percent Passing No. 4 Sieve	85 - 100
Percent Passing No. 200 Sieve	15 - 50
Expansion Index (ASTM D4829)	Less than 10
Organics	< 3% by weight
Sulfates	< 0.05 % by weight
Min. Resistivity	> 5,000 ohms-cm

9.4.4 Prior to importing fill, the Contractor shall submit test data that demonstrates that the proposed import complies with the recommended criteria for both geotechnical and environmental compliance. Also, prior to being transported to the site, the import material shall be certified by the Contractor and the supplier (to the satisfaction of the Owner and DSA) that the soils do not contain any environmental contaminates regulated by local, state or federal agencies having jurisdiction. This certification shall consist of, as a minimum, analytical data specific to the source of the import material in accordance with the Department of Toxic Substances Control, "Informational Advisory, Clean Imported Fill Material," dated October 2001. The list of constituents to be tested for the fill source shall be submitted to the Owner for review and approval prior to the Contractor testing the fill.

9.4.5 Onsite clay soils should be placed in loose lifts approximately 8 inches thick or less, moisture-conditioned or air dried to within one (1) to four (4) percent above optimum moisture content, and compacted to a dry density of at least 90 percent of the maximum dry density but not more than 95 percent of the maximum dry density as determined by ASTM Test Method D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.4.6 Imported granular engineered fill soils should be placed in loose lifts approximately 8 inches thick or less, moisture-conditioned or air dried to between optimum and 3 percent above the optimum moisture content, and compacted to at least 92 percent of the maximum dry density as determined by ASTM D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.4.7 In-place density tests should be conducted in accordance with ASTM D6938 at a frequency of at least:

Table No. 3

Area	Minimum Test Frequency
Building Pad Areas	1 test per 2,500 square feet per compacted lift
Walkways	1 test per 50 feet per compacted lift
Utility Lines	1 test per 150 feet per compacted lift

9.4.8 Recycled materials (such as asphaltic concrete or Portland cement concrete) should not be used within 10 feet of any improvement without approval by the Owner. Contractors should not assume that recycled materials can be used in preparing bids for the project without approval by the owner, and the Geotechnical Engineer. Recycled materials cannot be used in the proposed building pads.

9.4.9 Aggregate base shall comply with State of California Department of Transportation requirements for Caltrans Class 2 aggregate base, with the exception that aggregate base below the buildings shall not contain recycled materials. Documentation that the aggregate base to be used for the project meets the Class 2 material requirements (R-value, gradation, sand equivalent, durability, etc.) and is free of recycled materials, where planned below the building, should be provided to the Owner. All aggregate base should be compacted to a minimum of 95 percent relative compaction.

9.4.10 Open graded gravel and rock material such as ¾-inch crushed rock or ½-inch crushed rock should not be used as backfill including trench backfill. In the event gravel or rock is required by a regulatory agency for use as backfill (Contractor to obtain a letter from the agency stating the requirement for rock and/or gravel as backfill), all open graded materials shall be fully encased in a geotextile filter fabric, such as Mirafi 140N, to prevent migration of fine grained soils into the porous material. Gravel and rock cannot be used without the written approval of Moore Twining. If the contractor elects to use crushed rock (and if approved by Moore Twining), the contractor will be responsible for slurry cut off walls at the locations directed by Moore Twining. Crushed rock should be placed in thin (less than 8 inch) lifts and densified with a minimum of three (3) passes using a vibratory compactor.

9.5 Shallow Spread Foundations

9.5.1 Shallow spread foundations for the proposed multi-purpose building should be supported on engineered fill prepared as recommended in the "Site Preparation" section of this report. Shallow spread foundations for the multi-purpose building which are supported on engineered fill as recommended in this report, may be designed based on a maximum net allowable soil bearing pressure of 2,500 pounds per square foot for dead-plus-live loads, with a one-third increase for transient loads such as wind or seismic. Due to seismic design characteristics of the site, for the multi-purpose building, isolated column footings are not recommended. Tie beams are recommended to interconnect columns (if any) for the multi-purpose building.

9.5.2 Grade beams or continuous foundations used for resisting seismic loading for the seismic rehabilitation of existing buildings may be supported directly on the existing native or fill soils. A net allowable soil bearing pressure of 2,500 pounds per square foot (for dead-plus-live loads), may be used for design, with a one-third increase for transient loads such as wind or seismic.

9.5.3 Based on information reviewed as part of this investigation, it is our understanding the existing building foundations include isolated footings at each building corner and pilaster. The foundation type for the seismic upgrades should be evaluated by the structural engineer relative to the existing foundation system and the estimated static and seismic settlements included in this report. As part of the seismic rehabilitation, interconnection of the perimeter foundations is recommended.

9.5.4 Perimeter footings for the multi-purpose building shall have a minimum depth of 30 inches below the lowest final adjacent site grade. The foundations should be continuous around the perimeter of all structures to reduce moisture migration beneath the structure. Continuous perimeter foundations should be extended through doorways and/or openings that are not needed for support of loads. Interior foundations for the multi-purpose building should have a minimum depth of 18 inches below the bottom of the slab on grade.

9.5.5 At a minimum, foundations and/or grade beams for seismic upgrades to the existing buildings should extend to the depths of the existing foundations, or to at least 18 inches below site grade, whichever is deeper. If the new foundations and/or grade beams exert static pressures on the subgrade for support of load bearing systems, static settlement of the foundations should be anticipated. If static load support is anticipated, the proposed loading should be provided to Moore Twining to develop settlement estimates. Once the structural design concept has been determined, this information should be provided to Moore Twining for consideration.

9.5.6 New foundations should be designed and reinforced for the anticipated differential settlements and heave. There is potential for strong shaking from earthquakes due to the close proximity of the San Andreas Fault, and engineering designs should consider the potential for this strong shaking. A structural engineer experienced in foundation design should recommend the thickness, design details and concrete specifications for the foundations based on a total static settlement of 1 inch, a differential static settlement of ½ inch in 30 feet, and heave of up to 1 inch total and ½ inch differential in 30 feet should also be anticipated in design. In addition, design for the proposed multi-purpose building should consider seismic settlements of 1¼ inches total and ⅝ inches differential in 30 feet; and design for the seismic upgrades to existing buildings A, B, C, D, E, and G should consider seismic settlements of 2½ inches total and 1¼ inches differential in 30 feet.

9.5.7 The following values were developed using the Ground Motion Parameter Calculator provided by United States Geological Survey (http://earthquake.usgs.gov/) in accordance with the 2019 CBC. The site is located at roughly 36.8427 degrees latitude and -121.5316 degrees longitude.

The following seismic factors were developed using online data obtained from the Ground Motion Parameter Calculator provided by the Structural Engineers Association of California website (https://seismicmaps.org/) based upon a Site Class D, a latitude of 36.8427 degrees and a longitude of -121.5316 degrees. The data provided in Table No. 4 are based upon the procedures of Sections 1613.2.1 through 1613.2.4 of the 2019 California Building Code and were not determined based upon a ground motion hazard analysis. The structural engineer should review the values in Table No. 4 and determine whether a ground motion hazard analysis is required for the project considering the seismic design category, structural details, and requirements of ASCE 7-16 (Section 11.4.8 and other applicable sections). If required, Moore Twining should be notified and requested to conduct the additional analysis, develop updated seismic factors for the project, and update the following values.

Table No. 4

Item	2019 CBC Value
Site Class	D
Maximum Considered Earthquake (geometric mean) peak ground acceleration adjusted for site effects (PGA_M)	1.046
Mapped Maximum Considered Earthquake (geometric mean) peak ground acceleration (PGA)	0.951
Spectral Response At Short Period (0.2 Second), Ss	2.227
Spectral Response At 1-Second Period, S_1	0.926
Site Coefficient, Fa	1.0
Site Coefficient, Fv	See Note 1
Maximum considered earthquake spectral response acceleration for short period, S_{MS}	2.227
Maximum considered earthquake spectral response acceleration for 1 second, S_{M1}	See Note 1
Five percent damped design spectral response acceleration for short period, S_{DS}	1.484
Five percent damped design spectral response acceleration at 1-second period, S_{D1}	See Note 1

Notes: 1. Requires ground motion hazard analysis per ASCE Section 21.2 (ASCE 7-16, Section 11.4.8), unless an Exception of Section 11.4.8 of ASCE 7-16 is applicable for the project design.

9.5.8 Foundation excavations should be observed by Moore Twining prior to the placement of steel reinforcement and concrete to verify conformance with the intent of the recommendations of this report.

9.5.9 The moisture content of the footing excavations should be maintained at least one percent above the optimum moisture content of the native clays by the contractor until placement of concrete. If the excavations are allowed to dry, conditioning and remedial measures should be conducted to establish moisture contents of at least optimum moisture.

9.6 Frictional Coefficient and Passive Earth Pressure

9.6.1 The bottom surface area of concrete footings or concrete slabs in direct contact with engineered fill can be used to resist lateral loads. An allowable coefficient of friction of 0.30, can be used for design. In areas where slabs are underlain by a synthetic moisture barrier, an allowable coefficient of friction of 0.10, can be used for design.

9.6.2 The allowable passive resistance of the engineered fill may be assumed to be equal to the pressure developed by a fluid with a density of 300 pounds per cubic foot. The upper 6 inches of subgrade in landscape areas should be neglected in determining the total passive resistance.

9.6.3 This report does not contain recommendations for retaining walls. Retaining walls are not anticipated for this project. If future plans require retaining walls, our firm should be contacted to provide recommendations for retaining walls. In the event that the multi-purpose building has a stage type component, the active and at-rest pressures of the native soils and engineered fill may be assumed to be equal to the pressures developed by a fluid with a density of 40 and 61 pounds per cubic foot, respectively. These pressures assume level ground surface and do not include the surcharge effects of construction equipment, loads imposed by nearby foundations and roadways and hydrostatic water pressure.

9.6.4 Retaining walls (if any) should be constructed with imported, non-expansive granular free-draining backfill placed within the zone extending from a distance of 1 foot laterally from the bottom of the wall footing at a 1 horizontal to 1 vertical gradient to the surface. This requirement should be detailed on the construction drawings. Imported, granular backfill will reduce the effects of expansive soil pressures on the wall. Imported, granular wall backfill should meet the following requirements:

Percent Passing 3-Inch Sieve	100
Percent Passing No. 4 Sieve	75 - 100
Percent Passing No. 200 Sieve	0 - 15
Plasticity Index	Less than 5
Internal Angle of Friction	$\geq$30 degrees

9.7 Interior Concrete Slab-on-Grade

The slabs-on-grade on the project that should be prepared as interior slabs include: the floor slab of the multi-purpose building and any concrete flatwork directly adjacent to the building.

9.7.1 The recommendations provided herein are intended only for the design of interior concrete slabs-on-grade and their proposed uses, which do not include construction traffic (i.e., cranes, concrete trucks, and rock trucks, etc.). The building contractor should assess the slab section and determine its adequacy to support any proposed construction traffic.

9.7.2 A structural engineer experienced in slab-on-grade design should recommend the thickness, design details and concrete specifications for the proposed slabs-on-grade for a total static settlement of 1 inch, a differential static settlement of ½ inch in 30 feet, a differential seismic settlement of ¼ inch in 30 feet and heave of ½ inch, and heave of up to 1 inch total and ½ inch differential in 30 feet.

9.7.3 Interior slabs-on-grade and concrete walkways directly attached to the building (i.e., slabs on grade within the building pad preparation limits) should be supported on a minimum of 6 inches of non-recycled Class 2 aggregate base placed over at least 18 inches of imported non-expansive fill soils meeting the recommendations under section 9.4 of this report. If desired, the non-expansive section may consist of 24 inches of non-recycled Class 2 aggregate base.

9.7.4 The moisture content of the engineered fill below the imported non-expansive section should be verified to be within one (1) to four (4) percent above optimum moisture content prior to placing the imported non-expansive section.

9.7.5 The slabs and underlying subgrade should be constructed in accordance with current American Concrete Institute (ACI) standards.

9.7.6 A vapor retarder should be placed below interior building slabs where moisture could permeate into the interior and create problems. Refer to the American Concrete Institute's Guide to Concrete Floor and Slab Construction (ACI 302.1R) for selection and installation of moisture vapor retarders. It is recommended that a Stegowrap 15 vapor retarder be used where moisture could permeate into the interior and create problems, such as where flooring or floor slab applications will contain moisture sensitive materials (or other slab applications or uses). The vapor retarder should overlay the compacted layer of aggregate base. It should be noted that placing the PCC slab directly on the vapor retarder may increase the potential for cracking and curling; however, ACI recommends the placement of the vapor retarding membrane directly below the slab unless a watertight roofing system is in place prior to slab construction to reduce the amount vapor emission through the slab-on-grade. It is recommended that the slab be moist cured for a minimum of 7 days to reduce the potential for excessive cracking.

The underslab membrane should have a high puncture resistance (minimum of approximately 2,400 grams of puncture resistance), high abrasion resistance, rot resistant, and mildew resistant. It is recommended that the membrane be selected in accordance with the current ASTM C 755, Standard Practice For Selection of Vapor Retarder For Thermal Insulation and conform to the current ASTM E 1745 Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs and ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Waters, or as Ground Cover. It is recommended that the vapor barrier installation conform to the current ACI Manual of Concrete Practice, Guide for Concrete Floor and Slab Construction (302.1R), Addendum, Vapor Retarder Location and current ASTM E 1643, Standard Practice for Installation of Water Vapor Retarders Used In Contact with Earth or Granular Fill Under Concrete Slabs. In addition, it is recommended that the manufacturer of floor covering, floor covering adhesive or other slab material applications be consulted to determine if the manufacturers have additional recommendations regarding the design and construction of the slab-on-grade, testing of the slab-on-grade, slab preparation, application of the adhesive, installation of the floor covering and maintenance requirements. It should be noted that the recommendations presented in this report are not intended to achieve a specific vapor emission rate.

9.7.7 The membrane should be installed so that there are no holes or uncovered areas. All seams should be overlapped and sealed with the manufacturer approved tape, continuously at the laps so they are vapor tight. All perimeter edges of the membrane, such as pipe penetrations, interior and exterior footings, joints, etc., should be sealed per manufacturer's recommendations.

9.7.8 Tears or punctures that may occur in the membrane should be repaired prior to placement of concrete per the manufacturer's recommendations. Once repaired, the membrane should be inspected by the Contractor and the owner to verify adequate compliance with manufacture's recommendations.

9.7.9 The manufacturer's requirements vary regarding the surface and cover material around the placed membrane. Vapor retarding membranes should be installed in accordance with the manufacturers' specifications.

9.7.10 The membrane is not required beneath exposed concrete floors provided that moisture intrusion into the strictures permissible for the design life of the structure.

9.7.11 Additional measures to reduce moisture migration should be implemented for floors that will receive moisture sensitive coverings. These include: 1) constructing a less pervious concrete floor slab by maintaining a water-cement ratio of 0.52 or less in the concrete for slabs-on-grade, 2) ensuring that all seams and utility protrusions are sealed with tape to create a "water tight" moisture barrier, 3) placing concrete walkways or pavements adjacent to the structure, 4) providing adequate drainage away from the structure, 5) moist cure the slabs for at least 7 days, and 6) locating lawns, irrigated landscape areas, and flower beds away from the structure.

9.7.12 It should be noted that the placement and compaction of the Class 2 AB, the vapor retarding membrane installation, protection, etc., and the placement, curing, etc. of concrete should be in accordance with the project geotechnical engineering report, applicable ACI requirements, the manufacturer's requirements, the project plans, the project specifications, whichever is most stringent.

9.7.13 The Contractor shall test the moisture vapor transmission through the slab, the pH, internal relative humidity of the floor slab, etc., at a frequency and method as specified by the flooring manufacturer, adhesive manufacturer, underlayment manufacturer, etc. or as required by the plans and specifications, whichever is most stringent. The tests should be conducted in accordance with the applicable ASTM test methods. The results of vapor transmission tests, pH tests, internal relative humidity tests of the floor slab, ambient building conditions, etc. should be within floor manufacturer's, adhesive manufacturer's and underlayment manufacturer's specifications at the time the floor is placed. It is recommended that the floor, adhesive and underlayment manufacturers and subcontractor review and approve the test data prior to floor covering installation.

9.7.14 To reduce the potential for damaging slabs during construction, the following recommendations are presented: 1) design for a differential slab movement of ½ inch relative to interior columns; and 2) provide a layer of aggregate base below the slabs, and 3) the suitability of the loads from construction equipment which will operate on slabs or pavements should be evaluated by the Contractor prior to loading the slab.

9.7.15 Backfill the zone above the top of footings at interior column locations, building perimeters, and below the bottom of slabs with an approved backfill and/or an aggregate base section as recommended herein for the area below interior slabs-on-grade. This procedure should provide more uniform support for the slabs which may reduce the potential for cracking.

9.8 <u>Exterior Slabs-On-Grade</u>

The recommendations for exterior slabs provided below are not intended for use for slabs subjected to vehicular traffic. The following recommendations are intended only for lightly loaded sidewalks, walkways and slabs for pedestrian traffic which are not located next to the buildings.

9.8.1 Exterior improvements that are planned directly adjacent to the multi-purpose building and exterior improvements that subject the subgrade soils to a sustained load greater than 150 pounds per square foot should be prepared in accordance with the recommendations presented in this report for the interior floor slabs (See Section 9.7). The concrete should be cast free from adjacent foundations or other non-heaving edge restraints using expansion joint material.

9.8.2 Exterior slabs within the building pad preparation limits such as walkways directly adjacent to the proposed multi-purpose building should be supported on a minimum of 6 inches of aggregate base over 18 inches of imported, non-expansive engineered fill, over subgrade soils prepared as recommended in the “Site Preparation” section of this report. Exterior slabs on grade outside the multi-purpose building pad preparation limits and below new or replacement concrete door stoops or walkways for the existing buildings should be supported on a minimum of 4 inches of aggregate base over 8 inches of imported, non-expansive engineered fill, over subgrade soils prepared as recommended in the “Site Preparation” section of this report. If desired, the imported, non-expansive section may consist entirely of aggregate base. If any city, county, and/or state standards are cited on the plans or specifications, these standards should be in addition to the recommendations in this report.

9.8.3 The moisture content of the engineered fill below the imported non-expansive section should be verified to be within one (1) to four (4) percent above optimum moisture content just prior to placing the imported non-expansive section.

9.8.4 The concrete slabs-on-grade outside the multi-purpose building pad preparation limits and the exterior slabs for new and replacement stoops and exterior walkways to be constructed in conjunction with the seismic upgrades of the existing buildings should be designed with thickened edges. The thickened edges should extend to the bottom of the non-expansive soil section below the slabs (min. 12 inches), or deeper as determined by the designer. This should reduce the potential for infiltration of water into the aggregate base below these slabs.

9.8.5 If the subgrade is prepared, and then disturbed by equipment workers, weather or other sources, we recommend that the exposed subgrade to receive slabs be tested to verify adequate compaction. If adequate compaction is not verified, the disturbed non-expansive subgrade should be over-excavated, scarified, and compacted as engineered fill.

9.8.6 Since exterior sidewalks, curbs, etc. are typically constructed at the end of the construction process, the moisture conditioning conducted during earthwork can revert to natural dry conditions. Placing concrete walks and finish work over dry or slightly moist subgrade should be avoided. It is recommended that the general Contractor notify Moore Twining to conduct in-place moisture and density tests prior to placing aggregate base and concrete flatwork. Written test results indicating passing density and moisture tests should be in the general Contractor's possession prior to covering the native subgrade and prior to placing concrete for exterior flatwork.

9.9 Temporary Excavations

9.9.1 It is the responsibility of the Contractor to provide safe working conditions with respect to excavation slope stability. The Contractor is responsible for site slope safety, and classification of materials for excavation purposes, and maintaining slopes in a safe manner during construction. The grades classification and height recommendations presented for temporary slopes are for consideration in preparing budget estimates and evaluating construction procedures.

9.9.2 Temporary excavations should be constructed in accordance with CAL OSHA requirements. As a minimum, temporary cut slopes should not be steeper than 1½ to 1, horizontal to vertical, and flatter if possible. If excavations cannot meet these criteria, the temporary excavations should be shored.

9.9.3 Excavations adjacent to existing slabs and foundations could undermine foundation support and damage existing structures. However, excavations for the seismic upgrades will be required in several areas directly adjacent to existing foundations and slabs. Unsupported excavations shall not be conducted below a 1.5 horizontal to 1 vertical plane from the bottom of existing foundations, grade beams, or slabs unless the excavations are conducted in alternating, limited width slots. Thus, if the new foundations or grade beams for the seismic upgrades of the existing buildings require excavation below the 1.5 horizontal to 1 vertical plane, special procedures such as limited width temporary underpinning of existing foundations may be required by the contractor in order to install the foundations/grade beams.

9.9.4 Shoring systems, if used, should be designed by an engineer with experience in designing shoring systems and registered in the State of California. Shoring design should be based on the lateral earth pressures included in this report, temporary and permanent surcharge loads and hydrostatic pressures.

9.9.5 In no case should excavations extend below a 1.5H to 1V zone below existing utilities, foundations and/or floor slabs which are to remain after construction. Excavations which are required to be advanced below the 1.5H to 1V envelope should be shored to support the soils, foundations, and slabs.

9.9.6 Excavation stability should be monitored by the Contractor. Slope gradient estimates provided in this report do not relieve the Contractor of the responsibility for excavation safety. In the event that tension cracks or distress to the structure occurs, during or after excavation, the owners and Moore Twining should be notified immediately and the Contractor should take appropriate actions to prevent further damage or injury.

9.10 Utility Trenches

9.10.1 This report recommends imported, non-expansive fill soils be placed below concrete slabs-on-grade within the building pad preparation limits and a non-expansive soil section below exterior concrete slabs. After trenching of utilities, the non-expansive sections should be re-established below the slabs to match the adjacent sections. In the event the excavated non-expansive soils are mixed with clayey soils, these materials will not be allowed as trench backfill within the non-expansive zone. The contractor is responsible to conduct the excavation and trench backfilling to meet the requirements of this report, including the upper portions of the trenches to reestablish the non-expansive sections to match the adjacent sections.

9.10.2 The utility trench subgrade should be prepared by excavation of a neat trench without disturbance to the bottom of the trench. If sidewalls are unstable, the Contractor shall either slope the excavation to create a stable sidewall or shore the excavation. All trench subgrade soils disturbed during excavation, such as by accidental over-excavation of the trench bottom, or by excavation equipment with cutting teeth, should be compacted to a minimum of 90 percent relative compaction prior to placement of bedding material. The Contractor is responsible for notifying Moore Twining when these conditions occur and arrange for Moore Twining to observe and test these areas prior to placement of pipe bedding. The Contractor shall use such equipment as necessary to achieve a smooth undisturbed native soil surface at the bottom of the trench with no loose material at the bottom of the trench. The Contractor shall either remove all loose soils or compact the loose soils as engineered fill prior to placement of bedding, pipe and backfill of the trench.

9.10.3 The trench width, type of pipe bedding, the type of initial backfill, and the compaction requirements of bedding and initial backfill material for utility trenches (storm drainage, sewer, water, electrical, gas, cable, phone, irrigation, etc.) should be specified by the project Civil Engineer or applicable design professional in compliance with the manufacturer's requirements, governing agency requirements and this report, whichever is more stringent. The contractor is responsible for contacting the governing agency to determine the requirements for pipe bedding, pipe zone and final backfill. The contractor is responsible for notifying the Owner and Moore Twining if the requirements of the agency and this report conflict, the most stringent applies. For flexible polyvinylchloride (PVC) pipes, these requirements should be in accordance with the manufacturer's requirements or ASTM D-2321, whichever is more stringent, assuming a hydraulic gradient exists (gravel, rock, crushed gravel, etc. cannot be used as backfill on the project). The width of the trench should provide a minimum clearance of 8 inches between the sidewalls of the pipe and the trench, or as necessary to provide a trench width that is 12 inches greater than 1.25 times the outside diameter of the pipe, whichever is greater. As a minimum, the pipe bedding should consist of 4 inches of compacted (92 percent relative compaction) select sand with a minimum sand equivalent of 30 and meeting the following requirements: 100 percent passing the 1/4 inch sieve, a minimum of 90 percent passing the No. 4 sieve and not more than 10 percent passing the No. 200 sieve. The bottom of the trench should be compacted as engineered fill prior to placement of the pipe bedding. The haunches and initial backfill (12 inches above the top of pipe) should consist of a select sand meeting these sand equivalent and gradation requirements that is placed in maximum 6-inch thick lifts and compacted to a minimum relative compaction of 92 percent using hand equipment. The final fill (12 inches above the pipe to the surface) may be on-site or imported, non-expansive materials moisture conditioned and compacted as engineered fill. The project civil engineer should take measures to control migration of moisture in the trenches such as slurry collars, etc.

9.10.4 Contractors should assume all bedding and initial backfill materials will need to consist of imported material that meets the recommendations provided in this report.

9.10.5 If ribbed or corrugated HDPE or metal pipes are used on the project, then the backfill should consist of select sand with a minimum sand equivalent of 30, 100 percent passing the 1/4 inch sieve, a minimum of 90 percent passing the No. 4 sieve and not more than 10 percent passing the No. 200 sieve. The sand shall be placed in maximum 6-inch thick lifts, extending to at least 1 foot above the top of pipe, and compacted to a minimum relative compaction of 92 percent using hand equipment. Prior to placement of the pipe, as a minimum, the pipe bedding should consist of 4 inches of compacted (92 percent relative compaction) sand meeting the above sand equivalent and gradation requirements for select sand bedding. The width of the trench should meet the requirements of ASTM D2321 listed in the table below (minimum manufacturer requirements). As an alternative to the trench width recommended above and the use of the select sand bedding, a lesser trench width for HDPE pipes may be used if the trench is backfilled with a 2-sack sand-cement slurry from the bottom of the trench to 1 foot above the top of the pipe.

Table No. 5
Minimum Trench Widths for HDPE Pipe with Select Sand Backfill

Inside Diameter of HDPE Pipe (inches)	Outside Diameter of HDPE Pipe (inches)	Minimum Trench Width (inches) per ASTM D2321-00
12	14.2	30
18	21.5	39
24	28.4	48
36	41.4	64
48	55	80
60	67.3	96

9.10.6 Open graded gravel and rock material such as ¾-inch crushed rock or ½-inch crushed rock should not be used as backfill including trench backfill. In the event gravel or rock is required by a regulatory agency for use as backfill (Contractor to obtain a letter from the agency stating the requirement for rock and/or gravel as backfill), all open graded materials shall be fully encased in a geotextile filter fabric, such as Mirafi 140N, to prevent migration of fine grained soils into the porous material. Gravel and rock cannot be used without the written approval of Moore Twining. If the contractor elects to use crushed rock (and if approved by Moore Twining), the contractor will be responsible for slurry cut off walls at the locations directed by Moore Twining. Crushed rock should be placed in thin (less than 8 inch) lifts and densified with a minimum of three (3) passes using a vibratory compactor.

9.10.7 The contractor should use appropriate equipment and methods to avoid damage to utilities and/or structures during placement and compaction of the backfill materials.

9.10.8 Trench backfill should be placed, moisture conditioned, and compacted as engineered fill.

9.10.9 Jetting of trench backfill is not allowed to compact the backfill soils.

9.10.10 Storm drains and/or utility lines should be designed to be watertight. If encountered, leaks should be immediately repaired. Leaking storm drain and/or utility lines could result in trench failure, sloughing and/or soil heave causing damage to surface and subsurface structures, pavements, flatwork, etc. In addition, landscaping irrigation systems should be monitored for leaks. It is recommended that the pipelines be video inspected and pressure tested prior to placement of foundations, slabs-on-grade or pavements to verify that the pipelines are constructed properly and are watertight. The record of the video inspection along with a written description, prepared by the video inspection firm, of the condition of the pipe shall be provided to the Owner for review and approval.

9.10.11 Utility trenches should not be constructed within a zone defined by a line that extends at an inclination of 1.5 horizontal to 1 vertical downward from the bottom of building foundations (See Section 9.9.3 of this report).

9.10.12 The project Civil Engineer should include slurry type cutoff collars along utility trenches at critical locations to prevent the migration of surface water into the trench and along the trench backfill material.

9.11 Corrosion Protection

9.11.1 Based on the National Association of Corrosion Engineers corrosion severity rating listed in Section 6.6 of this report and the analytical results of analysis of two (2) near surface soil samples indicated the samples had resistivity values of 5,000 and 6,100 ohm-centimeters, with pH values of 8.4 and 8.3, respectively. Based on the resistivity values, the soils exhibit a “moderately corrosive” corrosion potential. Buried metal objects should be protected in accordance with the manufacturer’s recommendations based on a “moderately corrosive” corrosion potential. The evaluation was limited to the effects of soils to metal objects; corrosion due to other potential sources, such as stray currents and groundwater, was not evaluated. If piping or concrete are placed in contact with deeper soils or engineered fill, these soils should be analyzed to evaluate the corrosion potential of these soils.

9.11.2 Based on Table 19.3.1.1 - Exposure categories and classes from Chapter 19 of ACI 318, the sulfate concentration from chemical testing of soil samples falls in the S0 classification (less than 0.10 percent by weight) for concrete. Therefore, there are no restrictions required regarding the type, water-to-cement ratio, and strength of the concrete used for foundation and slabs due to the sulfate content. However, a low water to cement ratio of 0.52 or less is recommended for concrete slabs on grade.

9.11.3 These soil corrosion data should be provided to the manufacturers or suppliers of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturers or suppliers cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e., a corrosion engineer, with experience in corrosion protection should be consulted to design parameters. Moore Twining is not a corrosion engineer; thus, cannot provide recommendations for mitigation of corrosive soil conditions. It is recommended that a corrosion engineer be consulted for the site specific conditions.

10.0 <u>DESIGN CONSULTATION</u>

10.1 It is recommended Moore Twining be retained to review those portions of the contract drawings and specifications that pertain to earthwork and foundations prior to finalization to determine whether they are consistent with our recommendations. This service is not part of this current contractual agreement.

10.2 If Moore Twining is not retained for review, we assume no liability for the misinterpretation of our conclusions and recommendations. This review is documented by a formal plan/specification review report provided by Moore Twining.

11.0 <u>CONSTRUCTION MONITORING</u>

11.1 It is recommended that Moore Twining be retained to conduct the necessary observation, field-testing services and provide results so that action necessary to remedy indicated deficiencies can be taken in accordance with the plans and specifications. Upon completion of the work, the geotechnical engineer should provide a written summary of the observations, field testing and conclusions regarding the conformance of the completed work to the intent of the plans and specifications. This service is not, however, part of this current contractual agreement.

11.2 The construction monitoring is an integral part of this investigation. This phase of the work provides Moore Twining the opportunity to verify the subsurface conditions interpolated from the soil borings and make alternative recommendations if the conditions differ from those anticipated.

11.3 If the Moore Twining is not retained to provide engineering observation and field testing services during construction activities related to earthwork, foundations, and trenches; then, Moore Twining will not be responsible for compliance of any aspect of the construction with our recommendations or performance of the structures or improvements if the recommendations of this report are not followed. We recommend that if a firm other than Moore Twining is selected to conduct these services that they review this report and state that they understand and agree with the conclusions and recommendations of this report and they agree to conduct sufficient observations and testing to ensure the construction complies with this report's recommendations. Moore Twining should be notified, in writing, if another firm is selected to conduct observations and field-testing services prior to construction.

12.0 NOTIFICATION AND LIMITATIONS

12.1 The conclusions and recommendations presented in this report are based on the information provided regarding the proposed construction, and the results of the field and laboratory investigation, combined with interpolation of the subsurface conditions between boring locations.

12.2 The nature and extent of subsurface variations between borings may not become evident until construction.

12.3 If variations or undesirable conditions are encountered during construction, Moore Twining should be notified promptly so that these conditions can be reviewed and the recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

12.4 If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (more than 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

12.5 Changed site conditions, or relocation of proposed structures, may require additional field and laboratory investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

12.6 The conclusions and recommendations contained in this report are valid only for the project discussed in Section 3.4, “Existing and Anticipated Construction.” The use of the information and recommendations contained in this report for structures on this site not discussed herein or for structures on other sites not discussed in Section 3.1, “Site Description” is not recommended. The entity or entities that use or cause to use this report or any portion thereof for another structure or site not covered by this report shall hold Moore Twining, its officers and employees harmless from any and all claims and provide Moore Twining's defense in the event of a claim.

12.7 This report is issued with the understanding that it is the responsibility of the client to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

12.8 This report should not be construed as an environmental audit or study.

12.9 Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

12.10 This investigation report should not be used in the preparation of a Storm Water Pollution Prevention Plan (SWPPP). Use of this report or any data included in the report in preparation of an SWPPP would be at the owner’s sole risk.

12.11 Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site are purchased by another party, the purchaser must obtain written authorization and sign an agreement with Moore Twining in order to rely upon the information provided in this report for design or construction of the project.

We appreciate the opportunity to be of service to Aromas-San Juan Unified School District. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Respectfully Submitted,

MOORE TWINING ASSOCIATES, INC.
Geotechnical Engineering Division

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Professional Geologist

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Certified Engineering Geologist

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Manager

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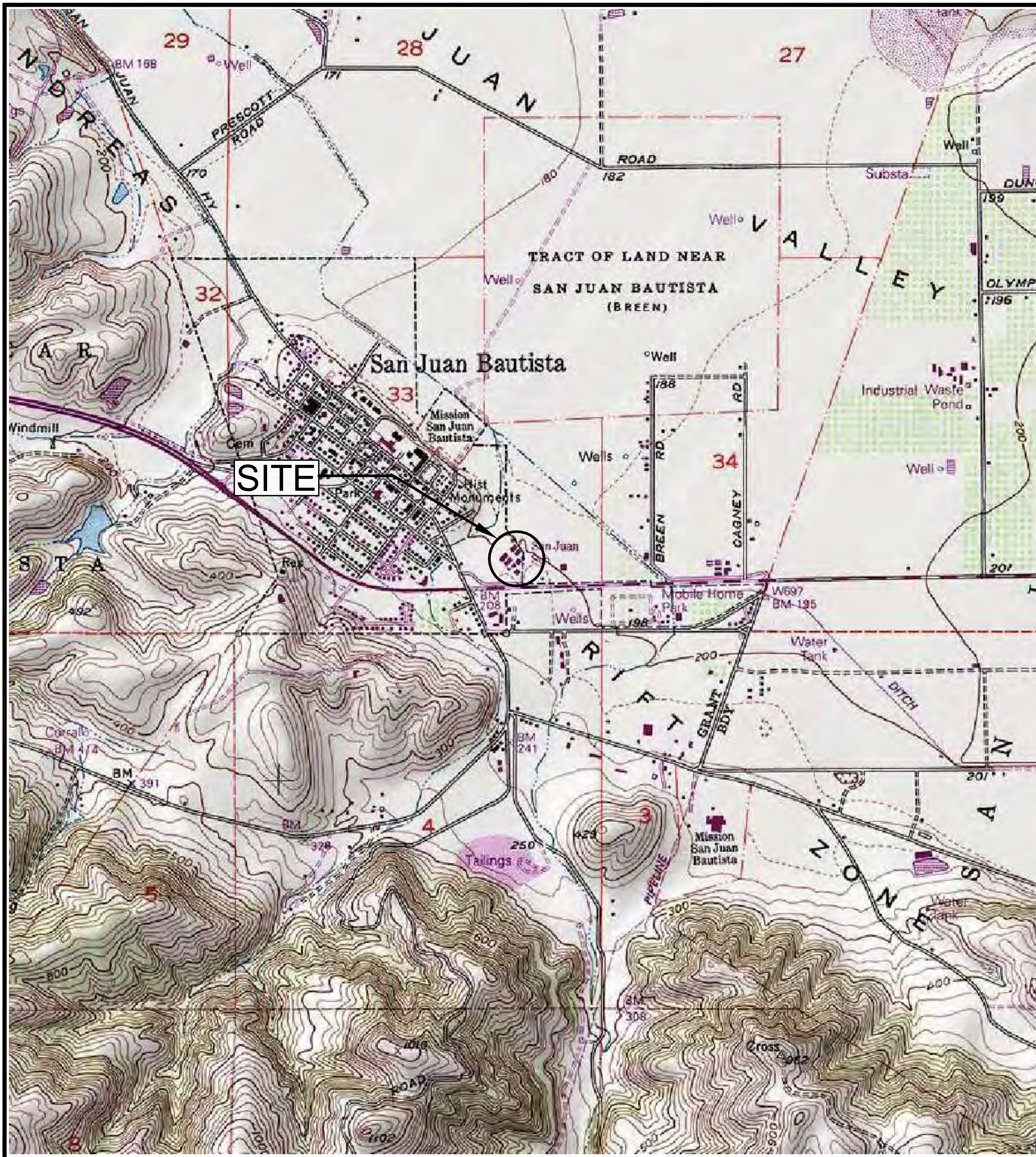
APPENDIX A

DRAWINGS



SOURCE: U.S.G.S. TOPOGRAPHIC MAP, 7 ½ MINUTE SERIES
SAN JUAN BAUTISTA, CALIFORNIA QUADRANGLE 1971, PHOTOREVISED 1993

0 2000
APPROXIMATE SCALE IN FEET

SITE LOCATION MAP
SAN JUAN SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

FILE NO.: 83701-03-01	DATE: 08/30/22
DRAWN BY: RM	APPROVED BY:
PROJECT NO. E83701.03	DRAWING NO. 1

MOORE TWINING ASSOCIATES, INC.
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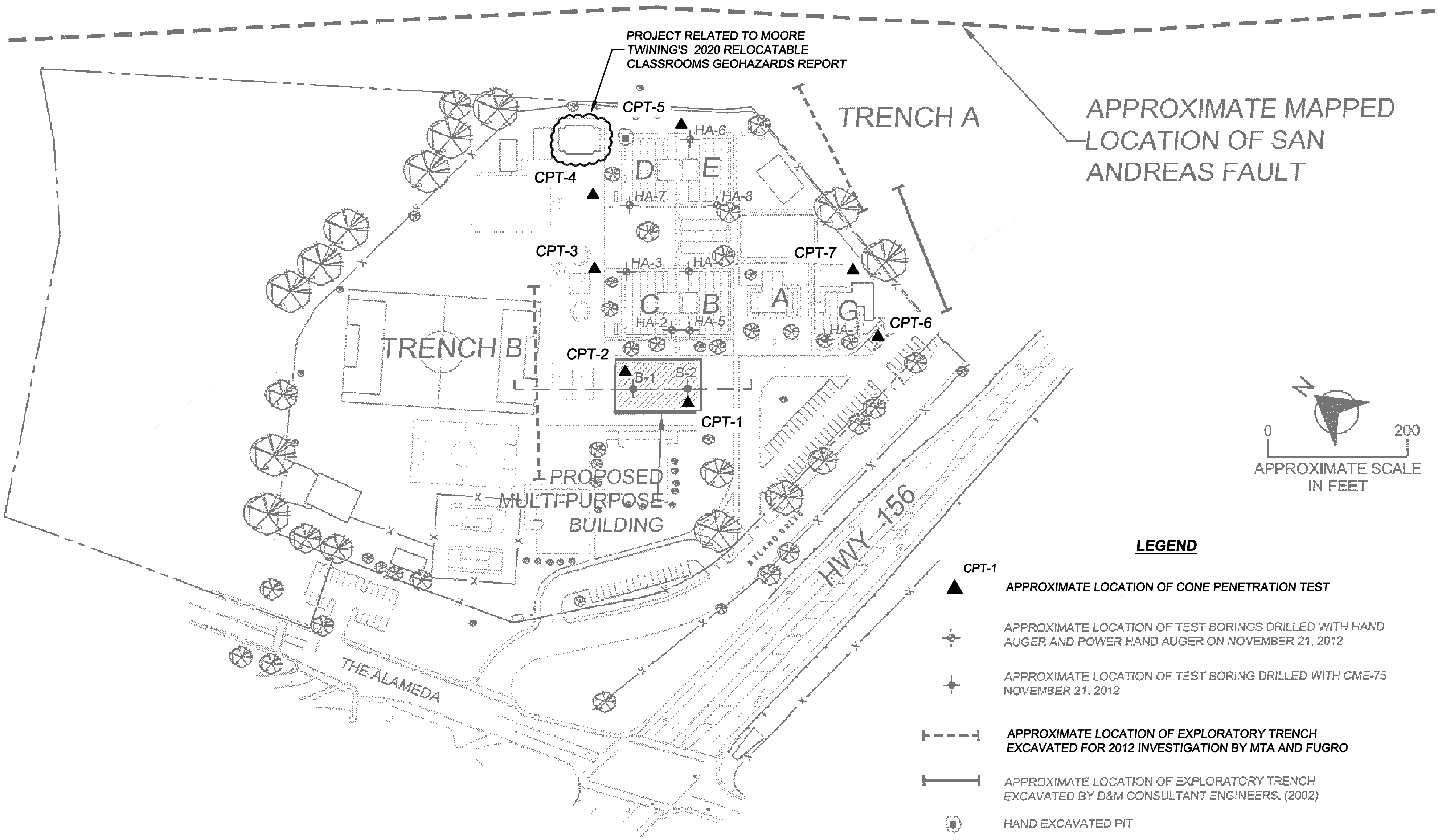
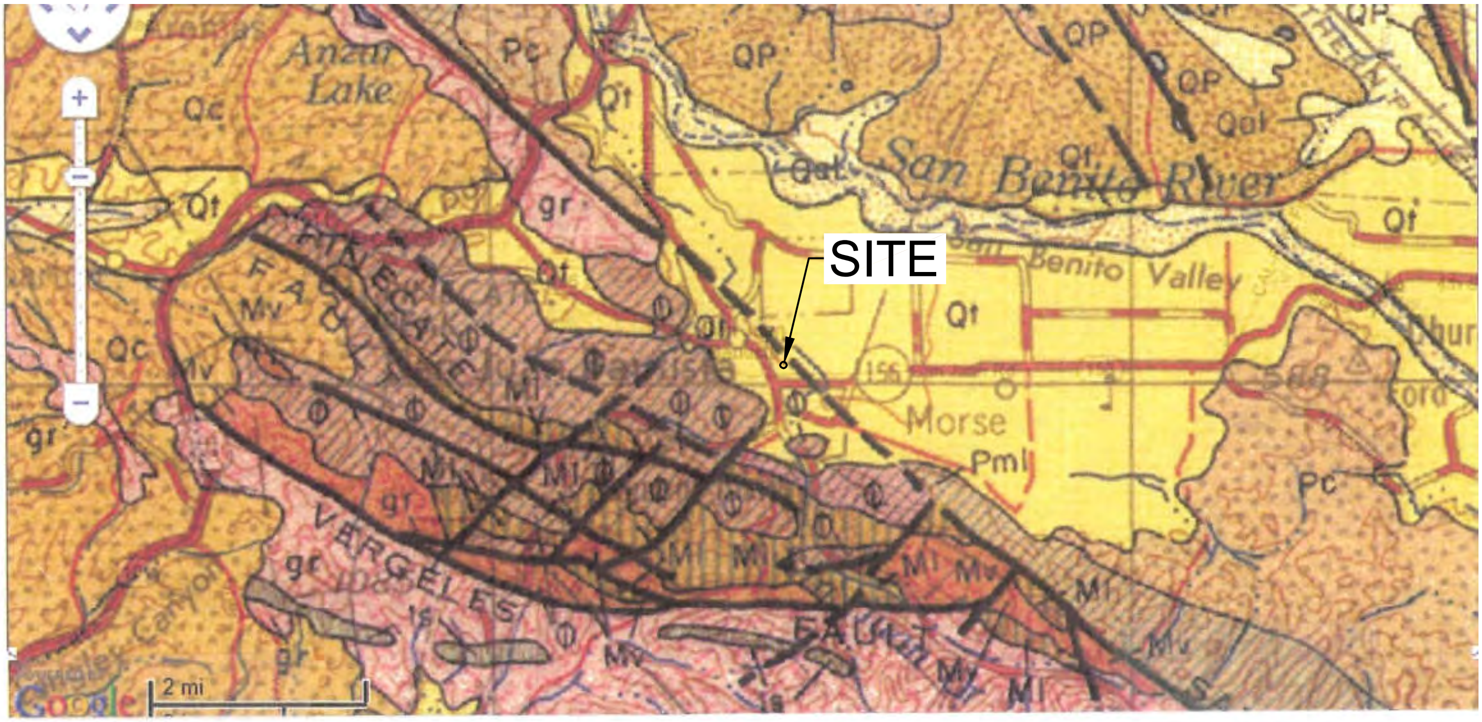


SOURCE: KASAVAN ARCHITECTS, SAN JUAN SCHOOL, SHEET A1.1, DATED 8/10/2011

SITE PLAN WITH TEST BORING, CONE PENETRATION TEST, AND FAULT TRENCH LOCATIONS SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-03-02	DATE DRAWN: 08/30/22	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.03	DRAWING NO. 2	



GEOLOGIC ATLAS OF CALIFORNIA - SANTA CRUZ SHEET

California Geological Survey, Geologic Atlas of California Map No. 020, 1:250,000 scale

Compilation by: Charles W. Jennings and Rudolph G. Strand

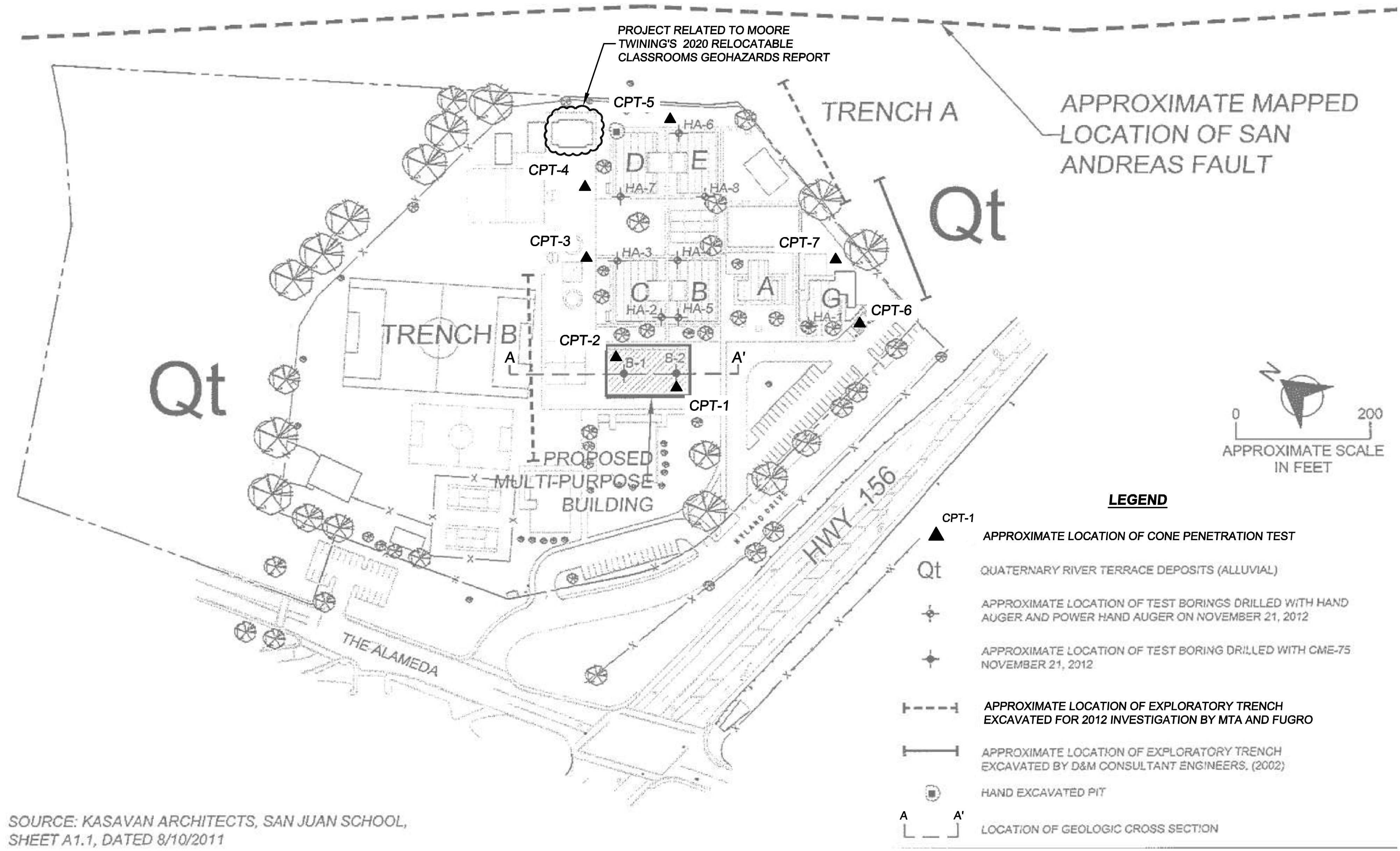
1958

DESCRIPTION OF MAP UNITS

Symbol	Description
Qs	Dune sand
Qal	Alluvium
Qsc	Stream channel deposits
Qf	Fan deposits
Qb	Basin deposits
Qt	River terrace deposits
Qm	Pleistocene marine and marine terrace deposits
Qc	Pleistocene nonmarine
QP	Plio-Pleistocene nonmarine
Pc	Undivided Pliocene nonmarine
Pu	Upper Pliocene marine
Pmlc	Middle and/or lower Pliocene nonmarine
Pml	Middle and/or lower Pliocene marine
Muc	Upper Miocene nonmarine
Mu	Upper Miocene marine
Mmc	Middle Miocene nonmarine
Mm	Middle Miocene marine
Ml	Lower Miocene marine
Mv	Miocene volcanic rocks Mv^r-rhyolite Mv^a-andesite Mv^b-basalt Mv^p-pyroclastic rocks
Oc	Oligocene nonmarine
Φ	Oligocene marine
E	Eocene marine
Ep	Paleocene marine
Ti	Tertiary intrusive (hypabyssal) rocks Ti^r-rhyolite Ti^a-andesite Ti^b-basalt
Ku	Upper Cretaceous marine
Kl	Lower Cretaceous marine
KJf	Franciscan group
KJfv	Franciscan volcanic and metavolcanic rocks
gr	Mesozoic granitic rocks
ub	Mesozoic ultrabasic intrusive rocks
ls	Pre-Cretaceous metamorphic rocks (ls=limestone)

REGIONAL GEOLOGIC MAP SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-03-02	DATE DRAWN: 08/30/22
	DRAWN BY: RM	APPROVED BY:
	PROJECT NO. E83701.03	DRAWING NO. 3

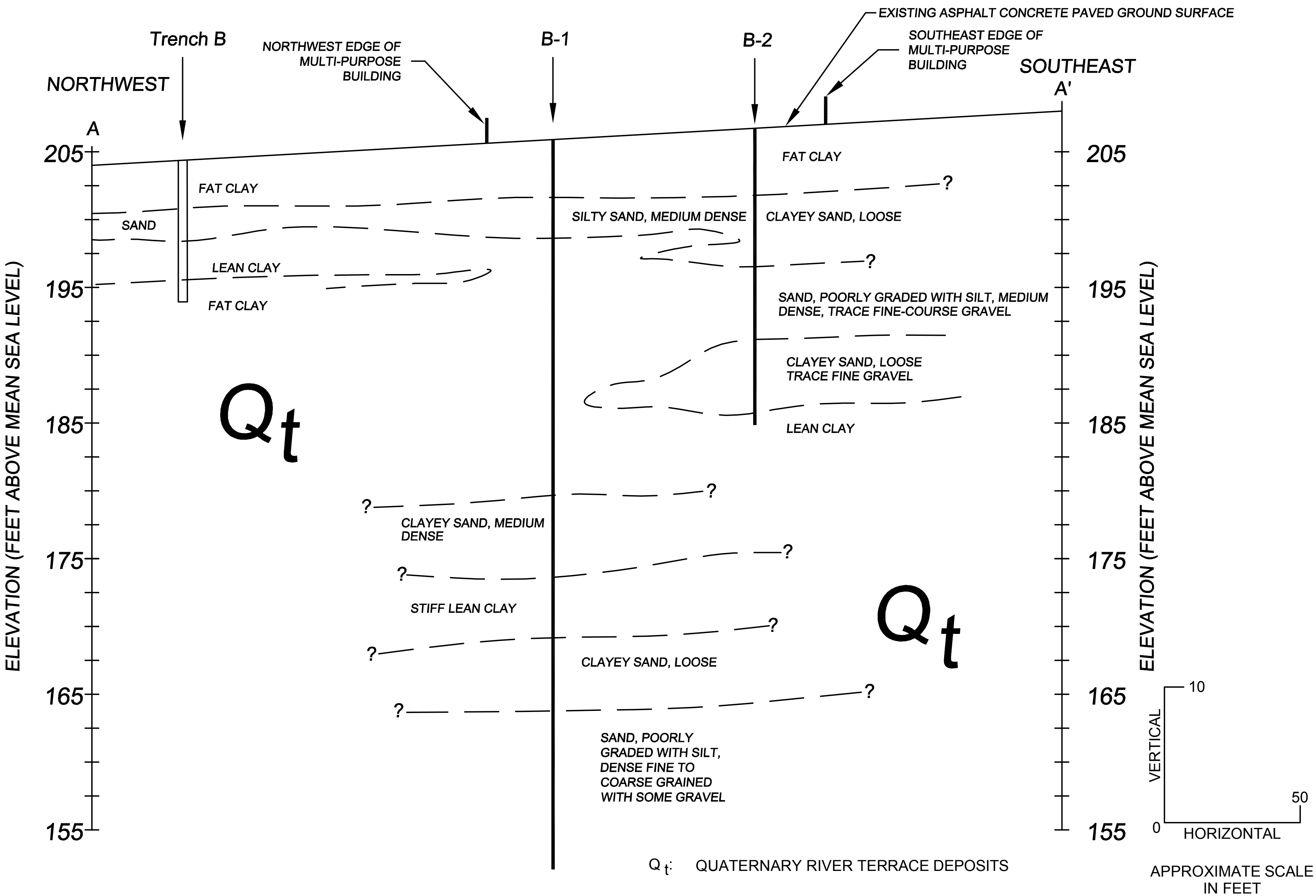
MOORE TWINING ASSOCIATES, INC.



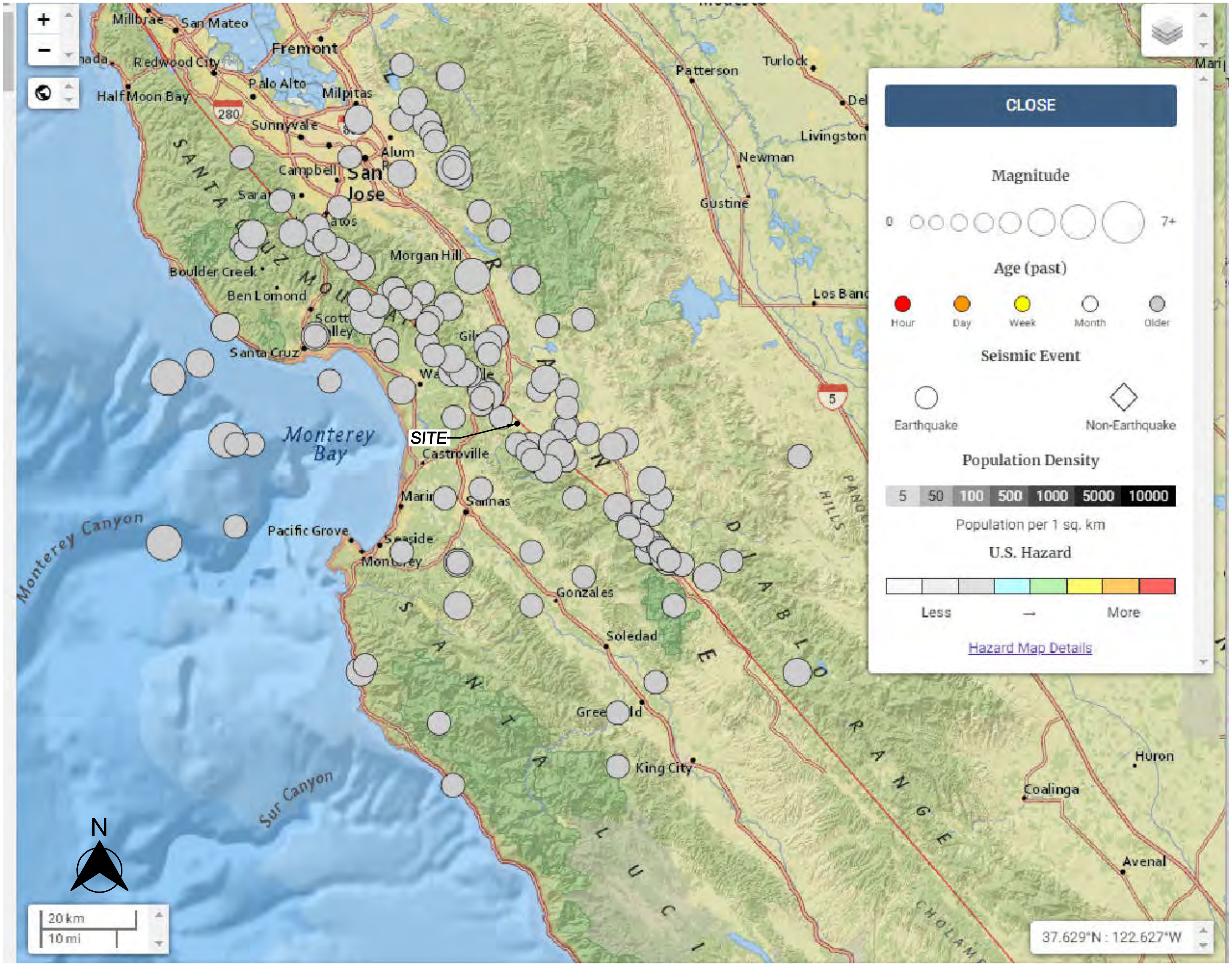
SITE GEOLOGIC MAP
SAN JUAN SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

FILE NO. 83701-03-02	DATE DRAWN: 08/30/22
DRAWN BY: RM	APPROVED BY:
PROJECT NO. E83701.03	DRAWING NO. 4

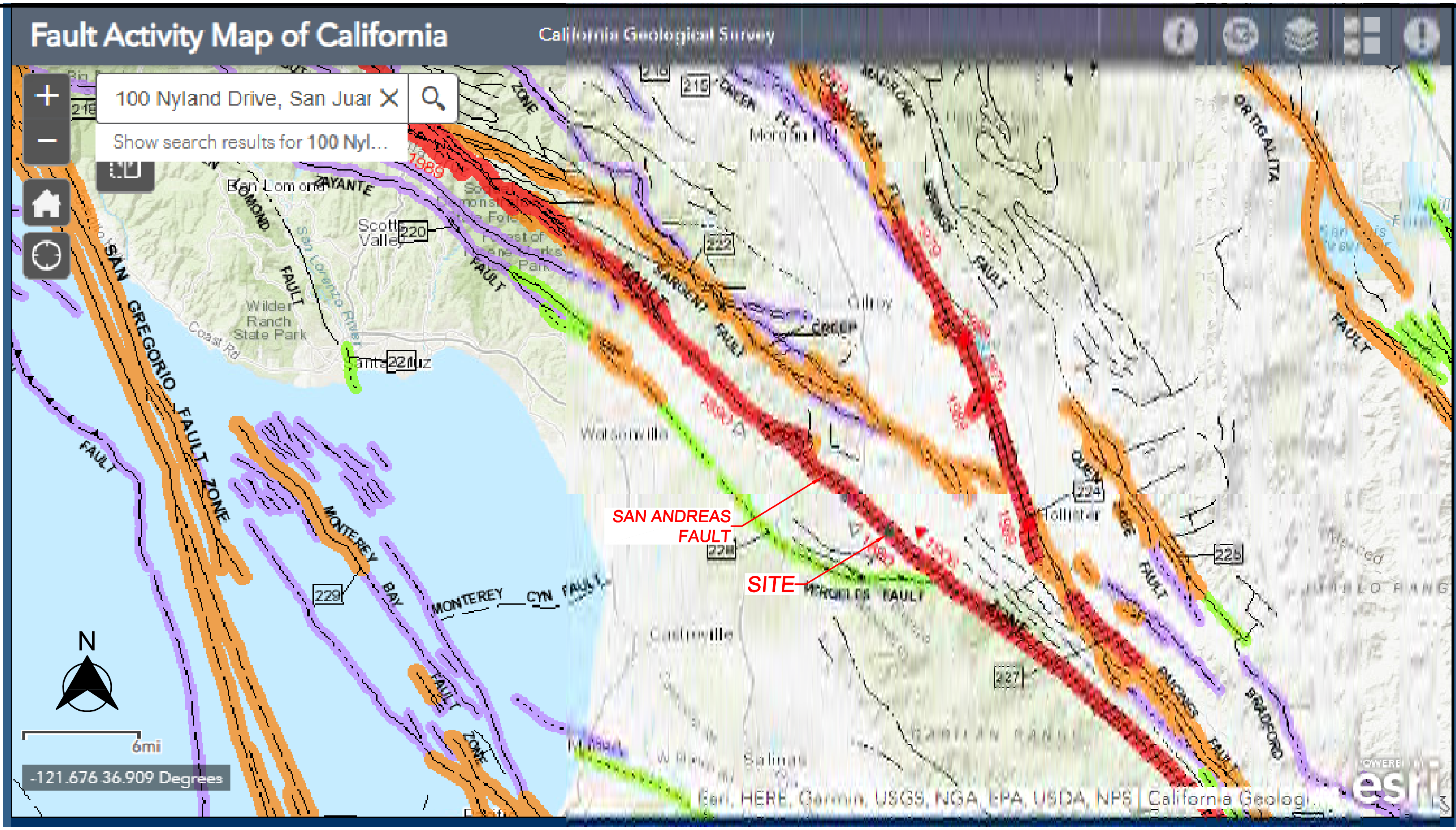
MOORE TWINING ASSOCIATES, INC.
Since 1898



GEOLOGIC SOIL PROFILE CROSS SECTION A-A' SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-03-02	DATE DRAWN: 08/30/22	MOORE TWINING ASSOCIATES, INC. Since 1898
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.03	DRAWING NO. 5	



HISTORICAL EARTHQUAKE EPICENTER MAP SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-03-02	DATE DRAWN: 08/30/22	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.03	DRAWING NO. 6	



LEGEND

Red line	Fault along which historic (last 200 years) displacement has occurred
Orange line	Holocene fault displacement (during past 11,700 years) without historic record
Green line	Late Quaternary fault displacement (during past 700,000 years)
Purple line	Quaternary fault (age undifferentiated)
Black line	Pre-Quaternary Fault (older than 1.6 million years) or fault without recognized Quaternary displacement.

REFERENCE: JENNINGS, CW., AND BRYAND, W.A., 2010 FAULT ACTIVITY MAP OF CALIFORNIA: CALIFORNIA GEOLOGICAL SURVEY, GEOLOGIC DATA MAP NO. 6

MAP OF ACTIVE AND POTENTIALLY ACTIVE FAULTS RELATIVE TO SITE SAN JUAN SCHOOL 100 NYLAND DRIVE SAN JUAN BAUTISTA, CALIFORNIA	FILE NO. 83701-03-02	DATE DRAWN: 08/30/22	MOORE TWINING ASSOCIATES, INC.
	DRAWN BY: RM	APPROVED BY:	
	PROJECT NO. E83701.03	DRAWING NO. 7	

APPENDIX B

LOGS OF BORINGS AND CONE PENETRATION TEST (CPT) SOUNDINGS

This appendix contains the final logs of borings and Cone Penetration Test (CPT) soundings. These logs represent our interpretation of the contents of the field logs and the results of the field and laboratory tests.

The logs and related information depict subsurface conditions only at these locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these test boring and CPT locations. Also, the passage of time may result in changes in the soil conditions at these test boring and CPT locations.

In addition, an explanation of the abbreviations used in the preparation of the logs and a description of the Unified Soil Classification System are provided at the end of Appendix B.

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: B-1

Project: San Juan School

Project Number: E83701.01

Drilled By: JS

Drill Type: CME 75

Auger Type: 6 5/8" O.D.

Hammer Type: 140 lb Trip

Logged By: AR

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: 25 Feet*

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		AC	Asphaltic Concrete = 4 inches over Aggregate Base = 3 inches			
	0/6 2/6 4/6	CH	FAT CLAY; Medium stiff, moist, high plasticity, dark brown to black Sandy, brown	EI = 72 pH = 8.4 SR = 5000 ohms-cm cl = < 0.00060 SS = 0.0029	6	21.5
	Full Push				--	7.6
5	3/6 5/6 9/6	SM	SAND, Silty; Medium dense, damp, fine to coarse grained, brown, trace fine gravel	DD = 112.1 pcf Non-Plastic	14	5.1
	5/6 6/6 2/6	GM	GRAVEL, Silty, with Sand; Loose, damp, fine to coarse, brown		8	14.5
10	0/6 0/6 2/6	CL	LEAN CLAY, with Sand; Very soft, moist, low to medium plasticity, brown, trace fine gravel		2	19.0
15	1/6 2/6 2/6		Soft, no gravel		4	28.1
20	4/6 8/6 8/6		Medium stiff, sandy, olive	DD = 117.7 pcf LL = 47 PI = 28	16	16.4
	4/6 3/6 3/6				6	
25	4/6 11/6 15/6	SC	SAND, Clayey; Medium dense, wet, fine to coarse grained, brown, trace fine to coarse gravel		26	

Notes: ** Groundwater encountered at 25 feet BSG. Measured at 15 feet BSG approximately 2 hours after termination of boring.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: B-1

Project: San Juan School

Project Number: E83701.01

Drilled By: JS

Drill Type: CME 75

Auger Type: 6 5/8" O.D.

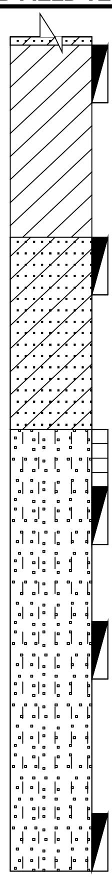
Hammer Type: 140 lb Trip

Logged By: AR

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: 25 Feet*



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
30	3/6 4/6 6/6	CL	LEAN CLAY, with Sand; Stiff, wet, low to medium plasticity, dark brown with red striping		10	
35	2/6 2/6 3/6	SC	SAND, Clayey; Loose, moist, fine to medium grained, brown	-200 = 42.2%	5	
40	18/6 22/6 41/6	SP-SM	SAND, Poorly Graded, with Silt; Dense, wet, fine to coarse grained, brown, trace fine gravel	DD = 119.8 pcf	63	14.4
	11/6 22/6 25/6				47	
45	11/6 22/6 34/6		Very dense		56	
50	10/6 14/6 17/6		Dense Gray		31	
			Bottom of boring at 51.5 feet BSG.			
55						

Notes: ** Groundwater encountered at 25 feet BSG. Measured at 15 feet BSG approximately 2 hours after termination of boring.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: B-2

Project: San Juan School

Project Number: E83701.01

Drilled By: JS

Drill Type: CME 75

Auger Type: 6 5/8" O.D.

Hammer Type: 140 lb Trip

Logged By: AR

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: 14.5 Feet

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		AC	Asphaltic Concrete = 4 inches over			
	3/6 7/6 8/6	CH	Aggregate Base = 2.5 inches		15	
	2/6 3/6 4/6		FAT CLAY; Medium stiff, moist, high plasticity, dark brown to black Calcification		7	
5	Full Push	SC	SAND, Clayey; Loose, moist, fine to medium grained, brown	ø = 34° c = 410 psf	--	
	2/6 3/6 4/6				7	
10	9/6 8/6 8/6	SP-SM	SAND, Poorly Graded, with Silt; Medium dense, damp, fine to coarse grained, brown, trace fine to coarse gravel		16	
15	Full Push	SC	SAND, Clayey; Loose, wet, fine to coarse grained, brown, trace fine gravel Increase in percent fines content at 16.5' BSG 4 inch layer of lean clay at 17' BSG	-200 = 26.2%	--	6
20	5/6 6/6 7/6	CL	LEAN CLAY, Sandy; Stiff, wet, low to medium plasticity, brown, trace fine gravel		13	
			Bottom of boring at 21.5 feet BSG.			
25						

Notes: ** Groundwater encountered at 14.5 feet BSG. Measured at 14 feet BSG approximately 15 minutes after termination of boring.*

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: HA-1

Project: San Juan School

Project Number: E83701.01

Drilled By: AR

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: AR

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Clayey; Moist, fine to medium grained, dark brown			
		Fill	SAND, Poorly Graded, with Silt; damp, fine to coarse grained, dark gray			
		SC	SAND, Clayey; Moist, fine to medium grained, dark brown Trace fine gravel at 4.5’	-200 = 45.9% pH = 8.3 SR = 6100 ohms-cm cl = <0.00060 SS = 0.00073		15.1 10.1
5			Auger refusal at 5.2 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: HA-2

Project: San Juan School

Project Number: E83701.01

Drilled By: AR

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: AR

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		SC	SAND, Clayey; Moist, fine to medium grained, dark brown			
			At 1.5 feet 4" layer with gravel Brown, trace fine gravel	-200 = 48.1%		13.3
			Decrease in percent clay with depth	EI = 41 LL = 41 PI = 24		10.7
5			Auger refusal at 4.3 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: HA-3

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

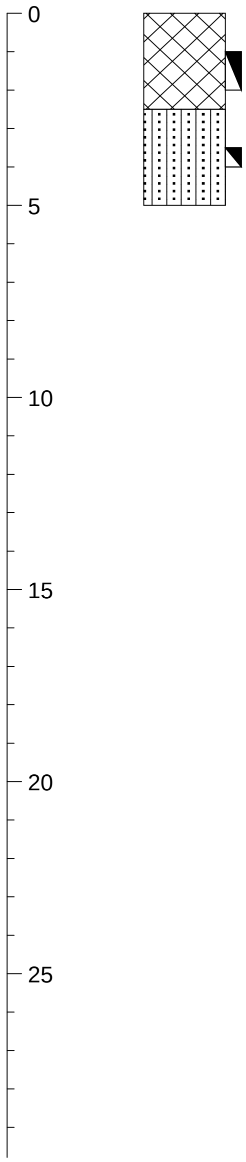
Hammer Type: N/A

Logged By: KC

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
		FILL	SAND, Clayey; Moist, dark brown, appears soft Sandy, yellowish brown, fine to coarse grained sand	-200 = 45.9%		12.8
		SM	SAND, Silty; Moist, fine grained, with trace clay, yellowish brown No notable clay, fine to medium grained With coarse gravel, granictic, rounded to subrounded, friable			7.7
			Auger refusal at 5 feet BSG due to gravel.			

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-4

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: KC

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	LEAN CLAY, Sandy; Moist, dark brown			
		SM	SAND, Silty, Damp, reddish brown, very coarse sand, some fine to coarse gravel			4.4
5			Auger refusal at 5 feet BSG due to gravel			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-5

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: KC

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Silty, Fine to medium grained, damp, dark brown			
		FILL	LEAN CLAY; Low plasticity, moist, dark brown			12.0
		FILL	Mixture silty sand, moist, dark brown, and lean clay, moist, dark brown, appears loose/soft.			8.8
5		CL	LEAN CLAY, Sandy; Moist, yellowish brown, with coarse sand, appears loose			
			With fine to coarse gravel, granitic, subrounded			
10			Auger refusal at 4.5 feet BSG due to gravel.			
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-6

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: KC

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Silty; Moist, fine grained, dark brown			
			Yellowish brown, damp, trace clay			7.9
		SM	SAND, Silty; Damp, fine grained, yellowish brown			
			Fine to coarse grained, with fine gravel			
5			Auger refusal at 3.5 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Since 1898

Test Boring: HA-7

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: KC

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL	SAND, Silty; Moist, fine to medium grained, dark brown			
		SM	SAND, Silty; Moist, fine to very coarse grained, with trace clay, yellowish brown Scattered coarse gravel			
5			Auger refusal at 3 feet BSG due to gravel			
10						
15						
20						
25						

Notes:

Figure Number

MOORE TWINING ASSOCIATES, INC.

Test Boring: HA-8

Project: San Juan School

Project Number: E83701.01

Drilled By: KC

Drill Type: Hand Auger

Auger Type: 4" Hand Auger & 2-Man Power Auger

Hammer Type: N/A

Logged By: KC

Date: 11/21/12

Elevation: NA

Depth to Groundwater First Encountered During Drilling: NE

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-Values blows/ft.	Moisture Content %
0		FILL FILL	LEAN CLAY; Moist, low to medium plasticity, dark brown to black, roots≤1/4			
			SAND, Silty; moist, fine to medium grained, brown, trace fine to coarse gravel, some cobbles			
		SP	SAND, Poorly Graded; Damp, medium to coarse grained, yellowish brown, trace fine to coarse gravel, trace cobbles			
5			Auger refusal at 4 feet BSG due to gravel.			
10						
15						
20						
25						

Notes:

Figure Number

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Asphalt concrete
	Fat clay
	Silty Sand
	Silty gravel
	Lean Clay
	Clayey Sand
	Poorly Graded Sand with Silt
	Fill
	Poorly Graded Sand
Misc. Symbols	
	Water table during drilling
	Boring continues
Soil Samplers	
	Standard penetration test
	California Modified split barrel ring sampler

Notes:

1. Exploratory borings were drilled on 11/21/12 using a CME 75 drill rig equipped with 6-5/8" outside diameter hollow stem augers, and with hand auger equipment.

2. Groundwater was encountered in any of the borings, see logs.

3. Boring locations were measured or paced from existing features.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. The "N-value" reported for the California Modified Split Barrel Sampler is the uncorrected field blow count. This value should not be interpreted as an SPT equivalent N-value.

6. Results of tests conducted on samples recovered are reported on the logs.

DD	= Natural dry density (pcf)	LL	= Liquid Limit (%)
-4	= Percent passing the #4 sieve (%)	PI	= Plasticity Index (%)
-200	= Percent passing the #200 sieve (%)	EI	= Expansion Index
pH	= Soil pH	SR	= Soil resistivity (ohms-cm)
SS	= Soluble sulfates (%)	Cl	= Soluble chlorides (%)
ø	= Internal Angle of Friction (degrees)	c	= Cohesion (psf)
pcf	= Pounds per cubic foot	psf	= Pounds per square foot
O.D.	= Outside diameter	AMSL	= Above mean sea level
N/A	= Not applicable	N/E	= Not encountered
TS	= Field Torvane Shear Strength (tons per square foot)	UC	= Unconfined compression (psf)

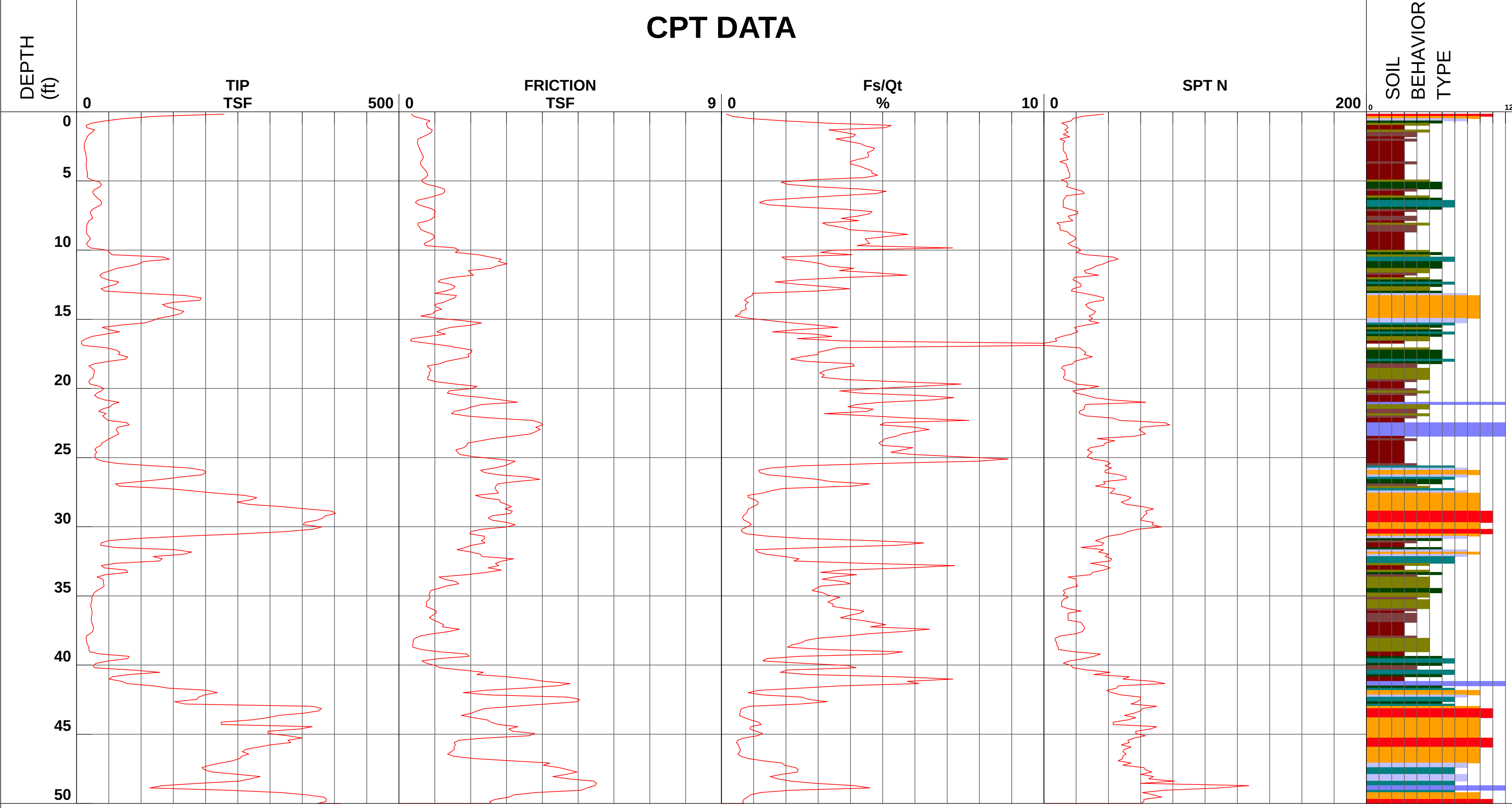
KEY TO SYMBOLS

Symbol	Description
Soil Samplers	
◥	Bulk/Grab sample

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(448).cpt
Job Number	E83701.03	Cone Number	DDG1589	GPS	
Hole Number	CPT-01	Date and Time	E83701.03	Maximum Depth	50.52 ft
EST GW Depth During Test		19.00 ft			

Net Area Ratio .8



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

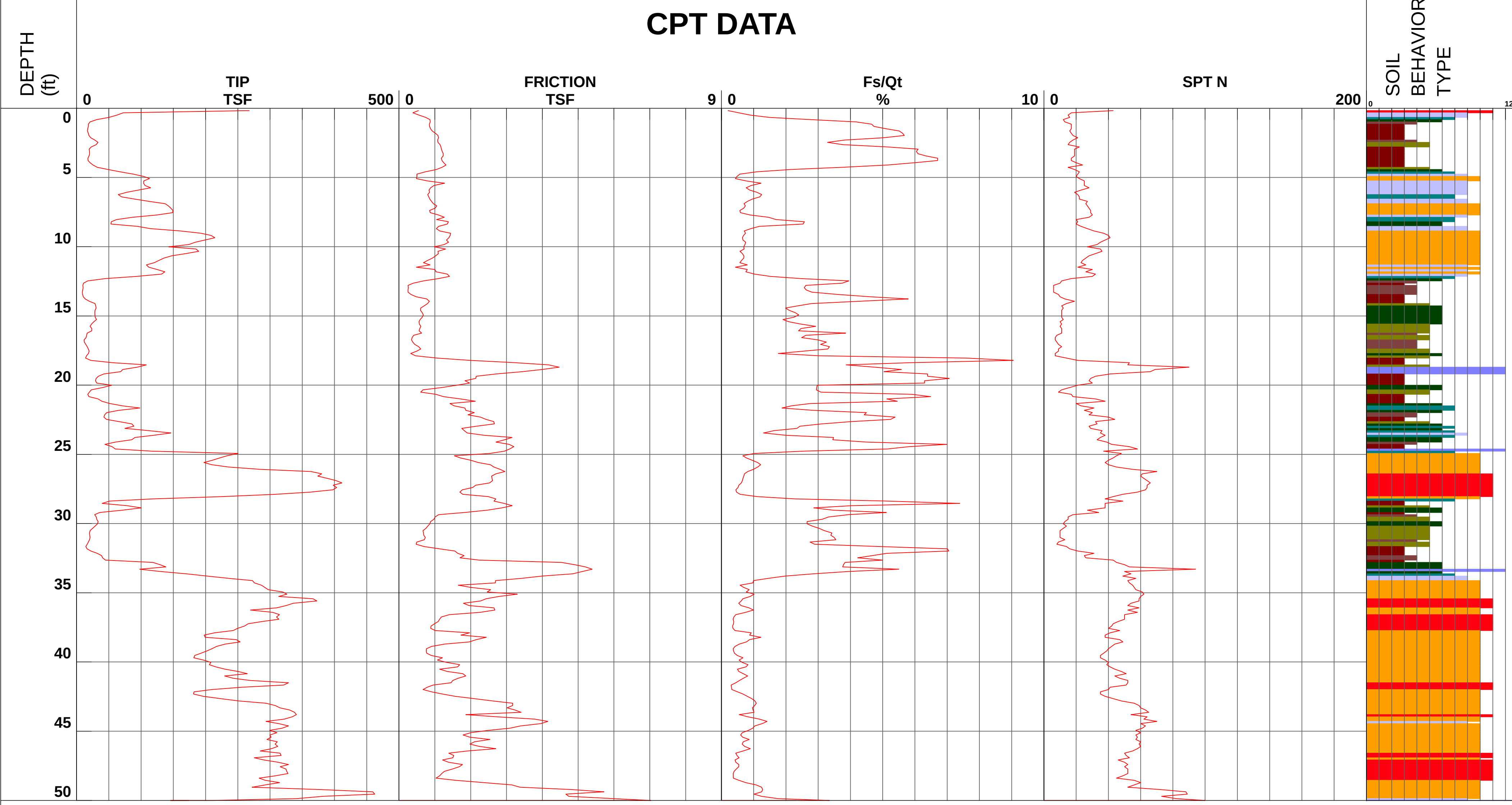
Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(447).cpt
Job Number	E83701.02	Cone Number	DDG1589	GPS	
Hole Number	CPT-02	Date and Time	E83701.02	Maximum Depth	50.52 ft
EST GW Depth During Test		19.00 ft			

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

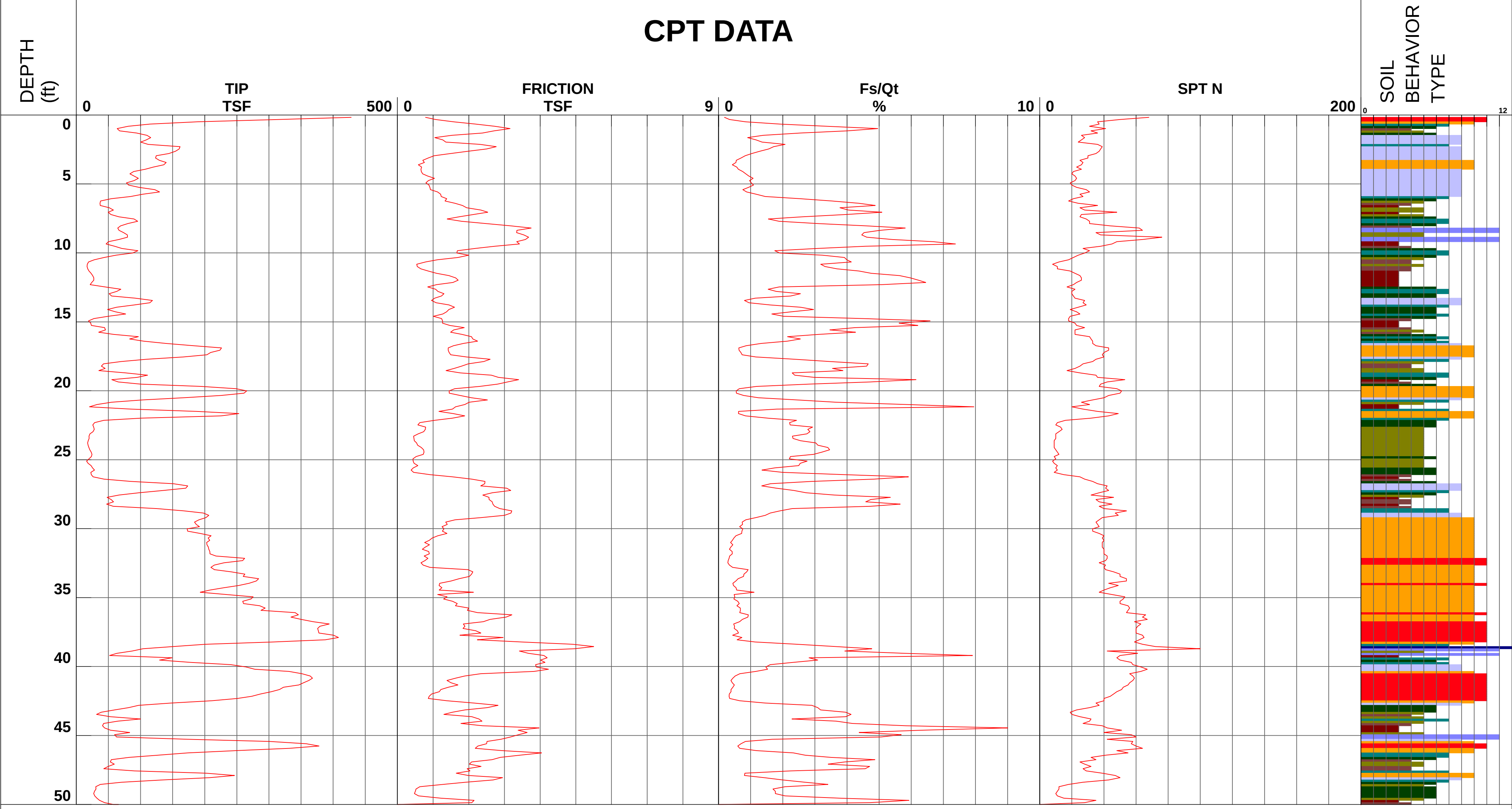
Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(446).cpt
Job Number	E83701.03	Cone Number	DDG1589	GPS	
Hole Number	CPT-03	Date and Time	E83701.03	Maximum Depth	50.36 ft
EST GW Depth During Test		19.00 ft			

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

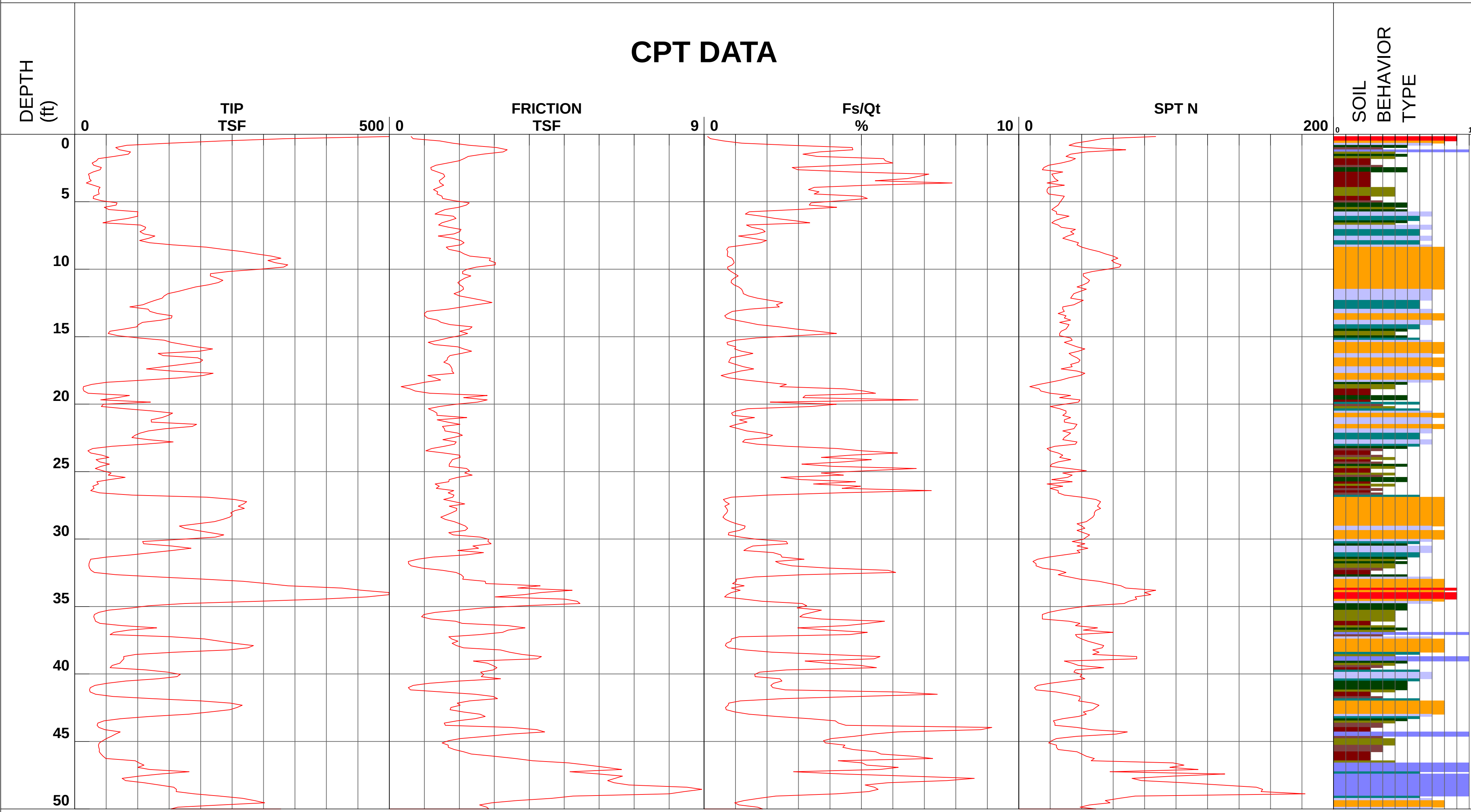
Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(445).cpt
Job Number	E83701.03	Cone Number	DDG1589	GPS	
Hole Number	CPT-04	Date and Time	E83701.03	Maximum Depth	50.52 ft
EST GW Depth During Test		20.00 ft			

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

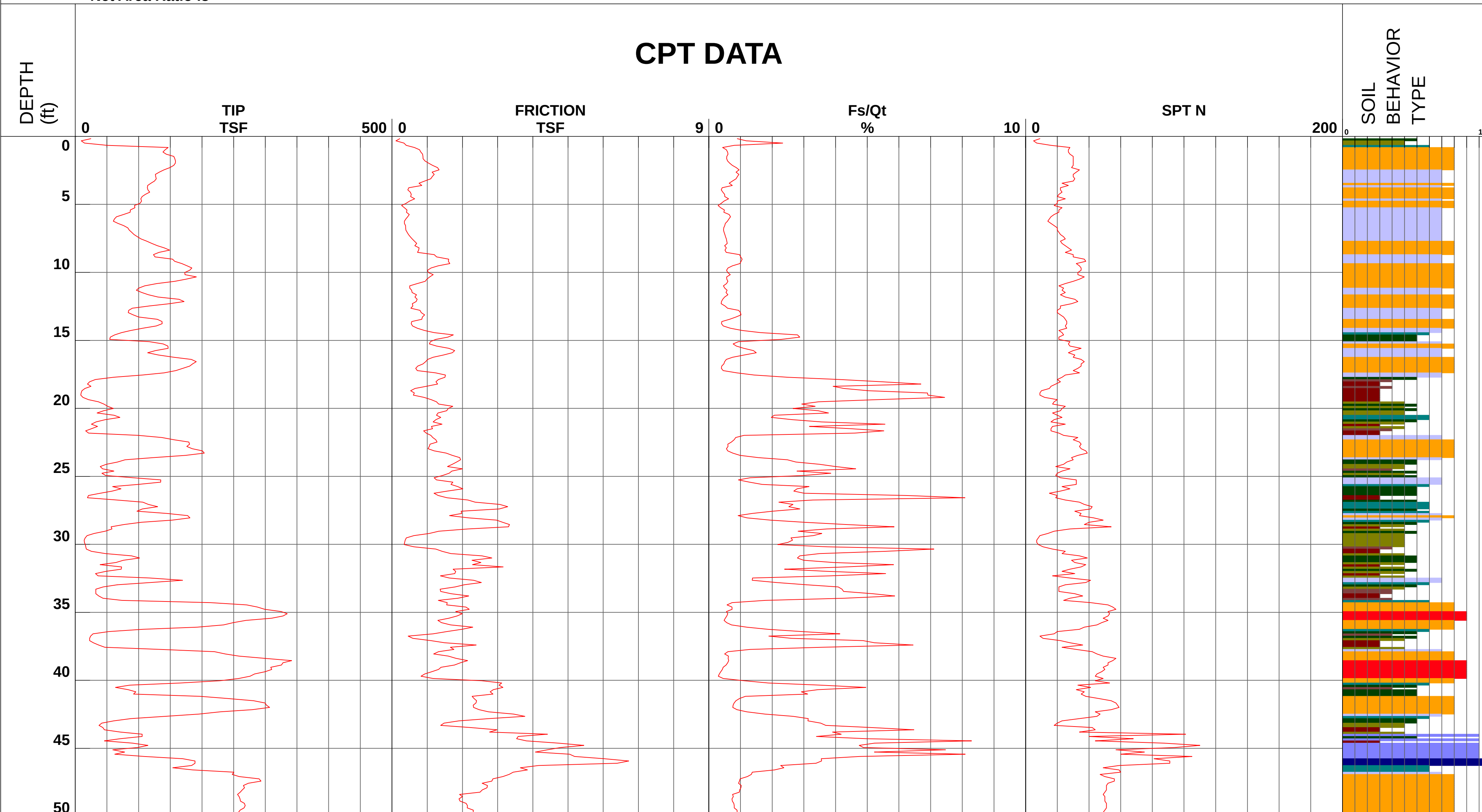
Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(444).cpt
Job Number	E83701.03	Cone Number	DDG1589	GPS	
Hole Number	CPT-05	Date and Time	E83701.03	Maximum Depth	50.52 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

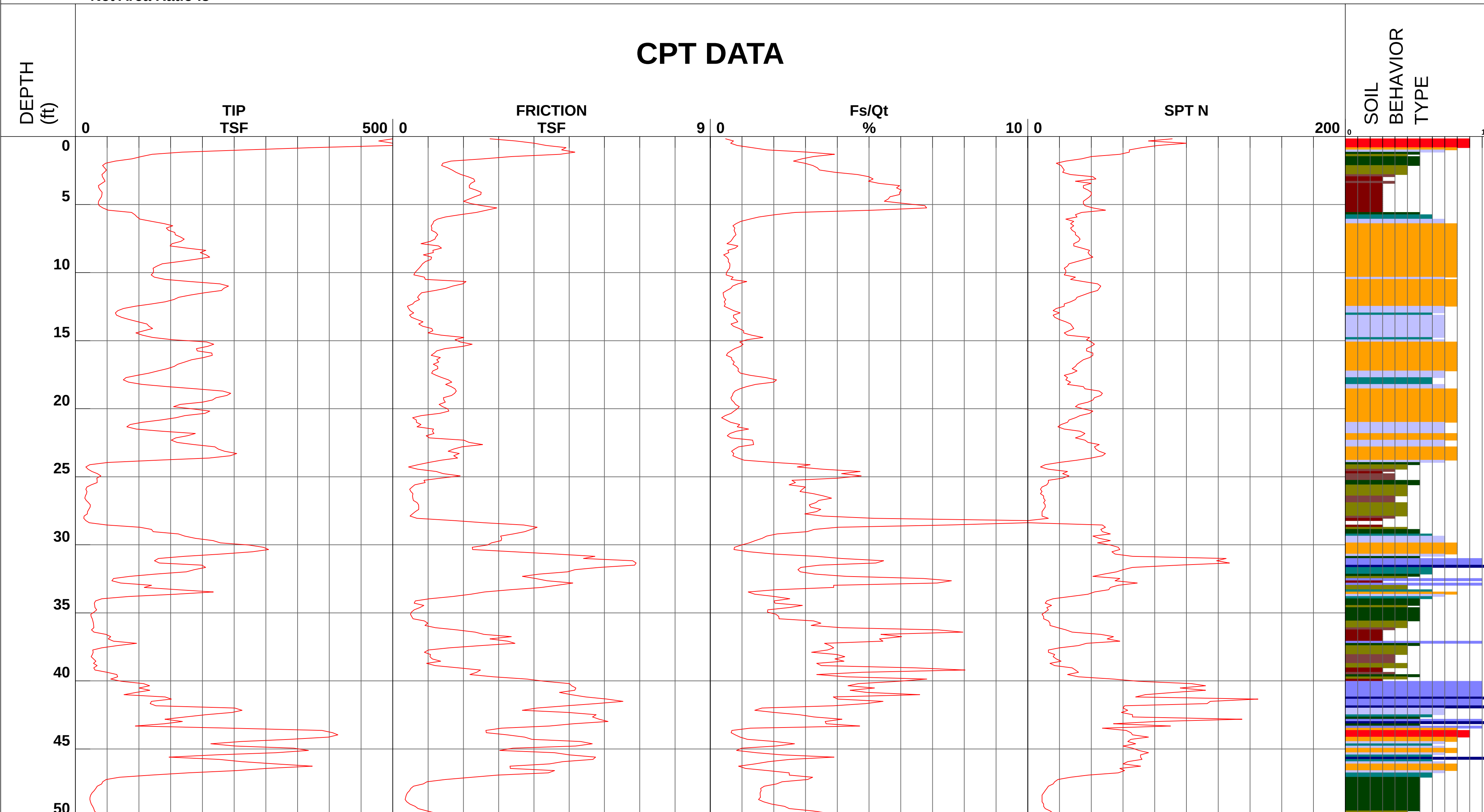
Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(449).cpt
Job Number	E83701.03	Cone Number	DDG1589	GPS	
Hole Number	CPT-06	Date and Time	E83701.03	Maximum Depth	50.52 ft
EST GW Depth During Test		28.00 ft			

Net Area Ratio .8



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 15cm squared

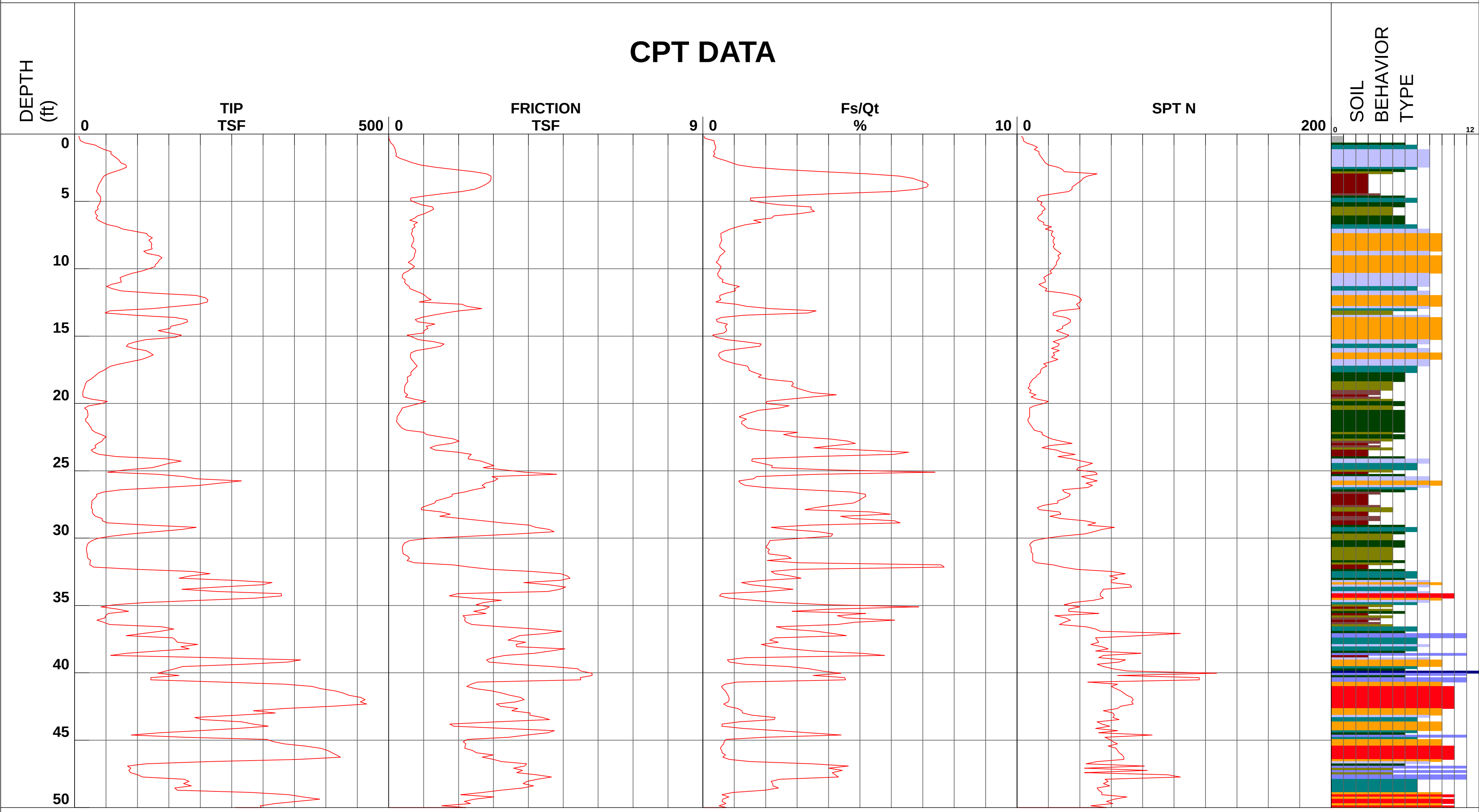
S*Soil behavior type and SPT based on data from UBC-1983

Moore Twining Associates, Inc.

Project	San Juan School	Operator	AJ-IM	Filename	SDF(450).cpt
Job Number	E83701.03	Cone Number	DDG1589	GPS	
Hole Number	CPT-07	Date and Time	E83701.03	Maximum Depth	50.52 ft
EST GW Depth During Test		21.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

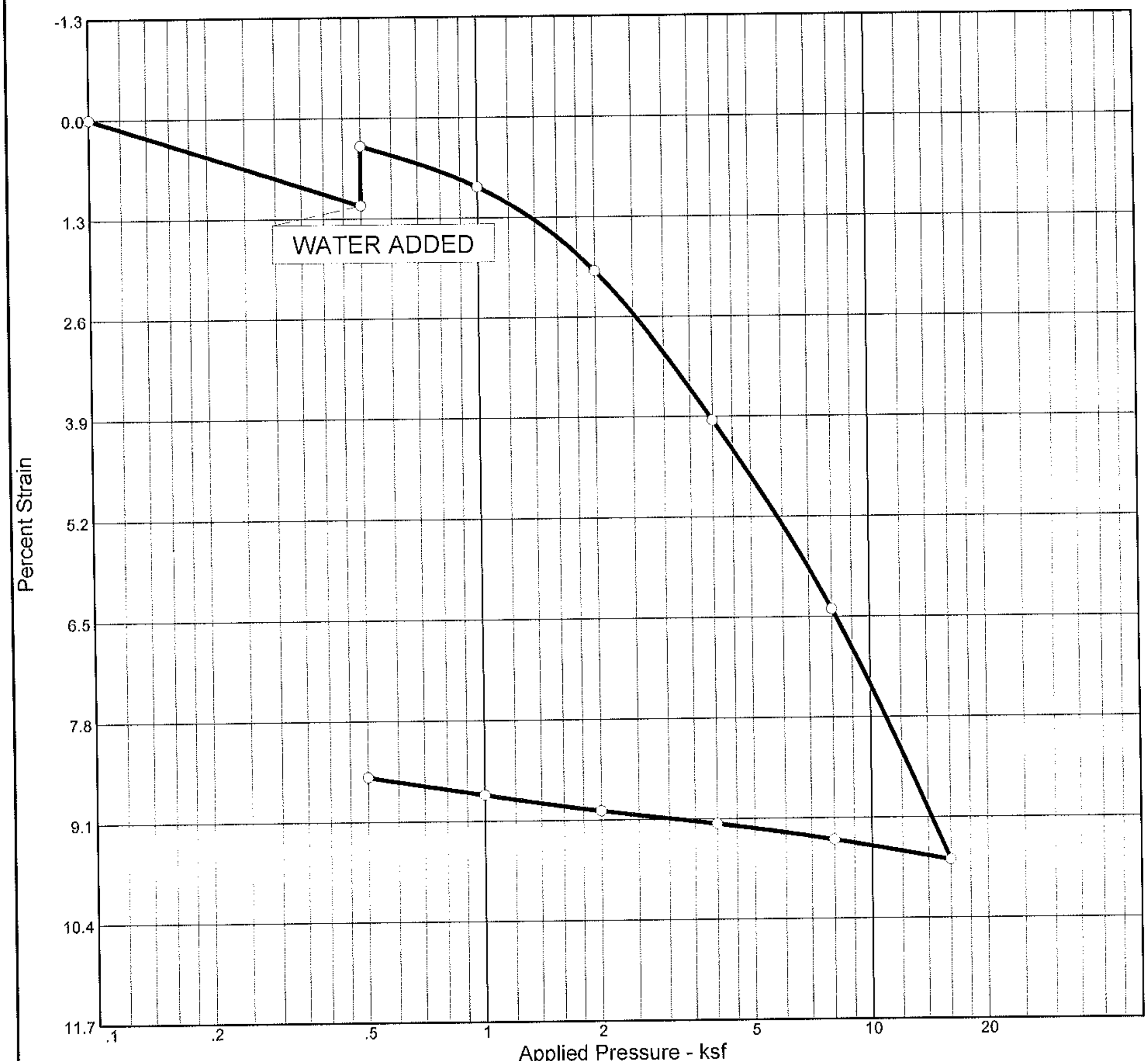
APPENDIX C

RESULTS OF LABORATORY TESTS

This appendix contains the individual results of the following tests. The results of the moisture content and dry density tests are included on the test boring logs in Appendix B. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

These Included:	To Determine:
Moisture Content (ASTM D2216)	Moisture contents representative of field conditions at the time the sample was taken.
Dry Density (ASTM D2937)	Dry unit weight of sample representative of in-situ or in-place undisturbed condition.
Consolidation (ASTM D2435)	The amount and rate at which a soil sample compresses when loaded, and the influence of saturation on its behavior.
Direct Shear (ASTM D3080)	Soil shearing strength under varying loads and/or moisture conditions.
Grain-Size Distribution (ASTM D422)	Size and distribution of soil particles, i.e., sand, gravel and fines (silt and clay).
Expansion Index (ASTM D4829)	Swell potential of soil with increases in moisture content
Atterberg Limits (ASTM D4318)	The consistency and "stickiness," as well as the range of moisture contents within which the material is "workable
Sulfate Content (ASTM D4327)	Percentage of water-soluble sulfate as (SO4) in soil samples. Used as an indication of the relative degree of sulfate attack on concrete and for selecting the cement type.
Chloride Content (ASTM D4327)	Percentage of soluble chloride in soil. Used to evaluate the potential attack on encased reinforcing steel.
Resistivity (ASTM D1125)	The potential of the soil to corrode metal.
pH (ASTM D4972)	The acidity or alkalinity of subgrade material.

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_s	Swell Press. (ksf)	Swell %	e_o
Sat.	Moist.											
87.2 %	21.7 %	99.7			2.65		3.76	0.18	0.01	1.22	0.7	0.659

MATERIAL DESCRIPTION	USCS	AASHTO

Project No. E83701.01 **Client:**

Project: San Juan School

Source: **Sample No.:** B-2 **Elev./Depth:** 1-2.5'

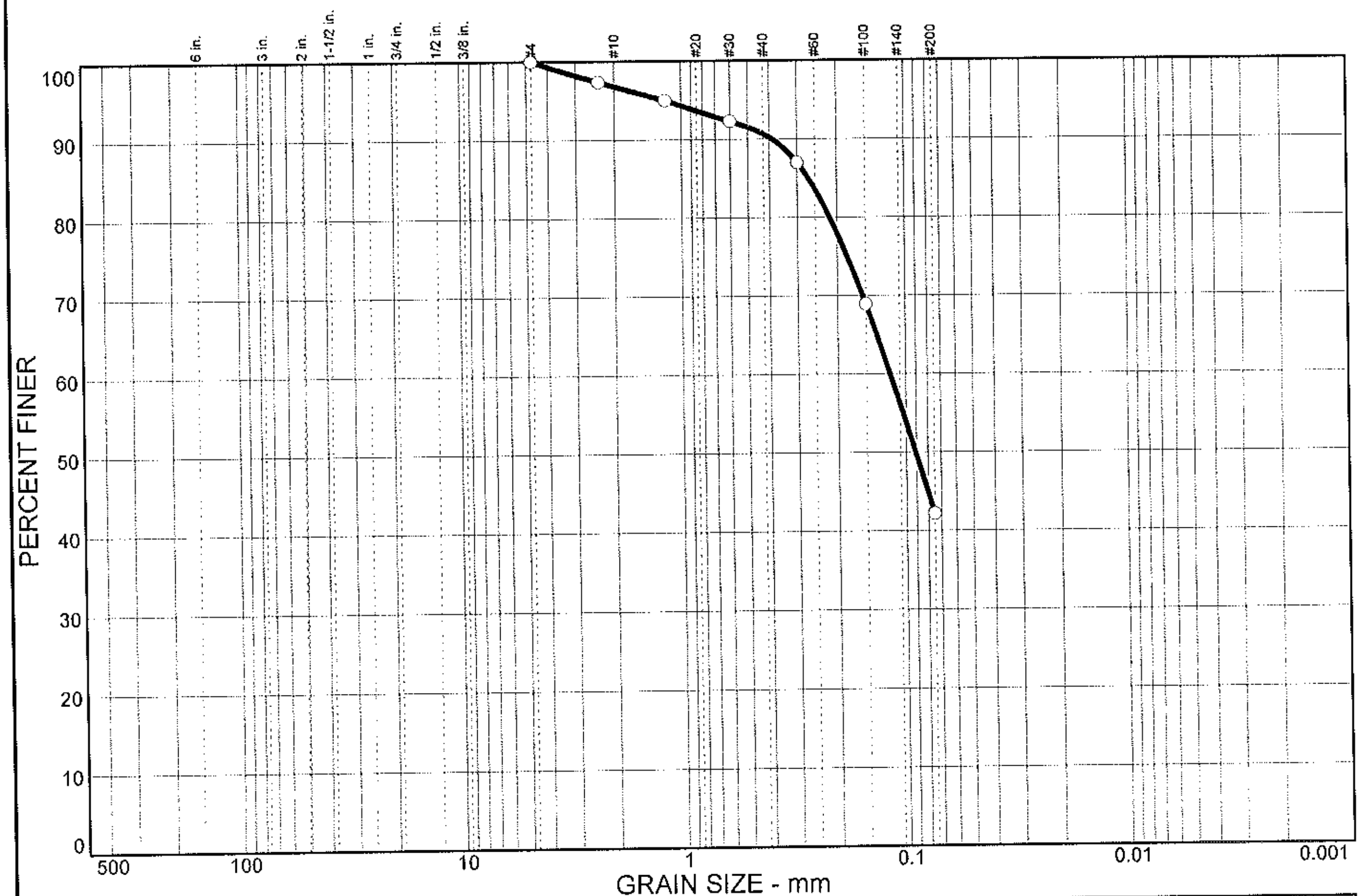
Moore Twining Associates, Inc.

Fresno, CA

Remarks:

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	3.2	6.1	48.5	42.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	97.4		
#16	95.0		
#30	92.3		
#50	87.0		
#100	68.9		
#200	42.2		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.268 D_{60}= 0.117 D_{50}= 0.0910
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=0.59

Sample No.: B-1
Location:

Source of Sample: San Juan School

Date: 11/21/12
Elev./Depth: 35-36.5'

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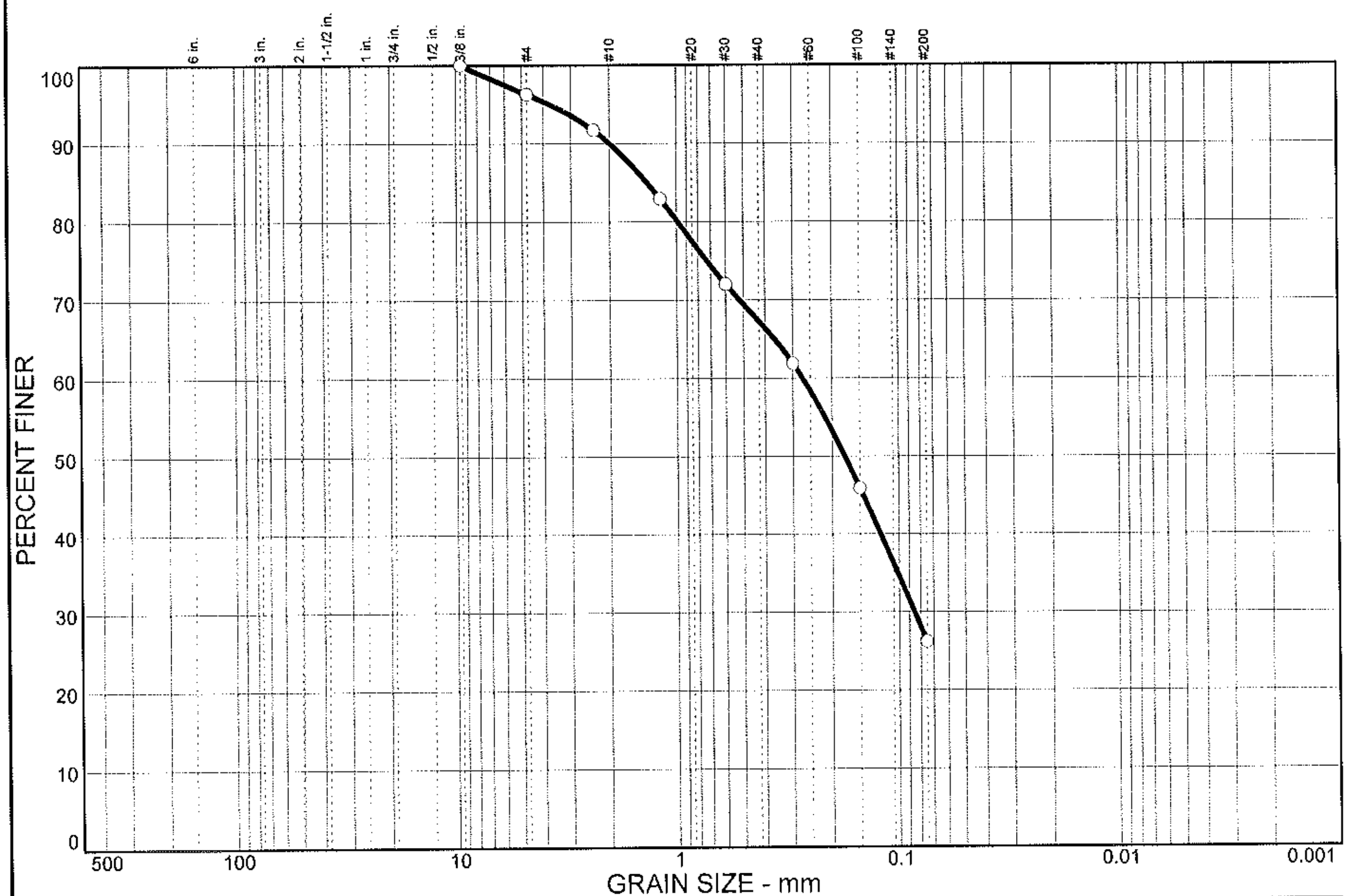
Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School

Project No: E83701.01

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	3.7	6.3	22.8	41.0	26.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	96.3		
#8	91.7		
#16	82.9		
#30	72.0		
#50	61.9		
#100	45.9		
#200	26.2		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.36 D_{60}= 0.271 D_{50}= 0.175
D_{30}= 0.0854 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=1.49

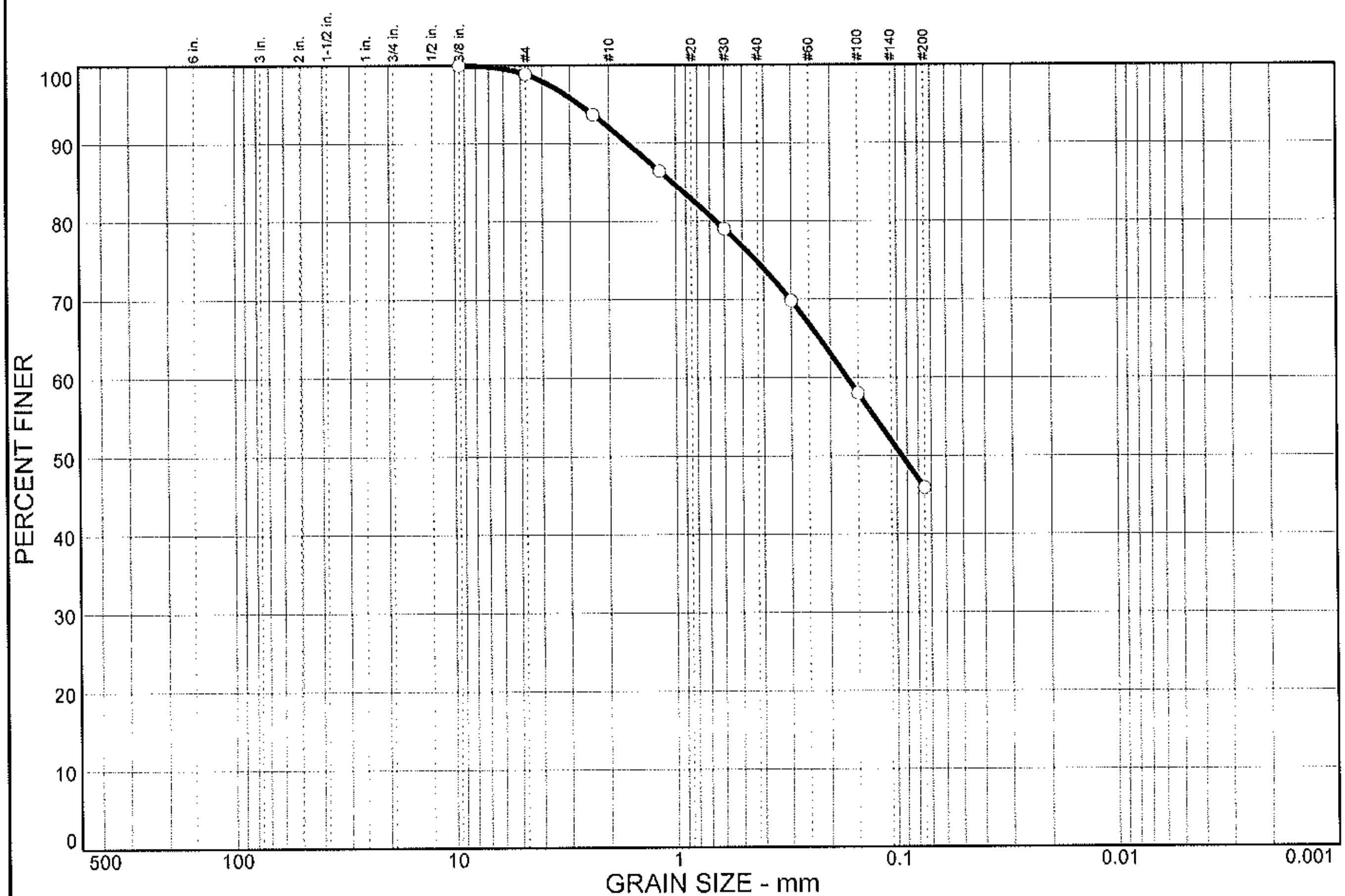
Sample No.: B-2
Location:
Source of Sample: San Juan School
Date: 11/21/12
Elev./Depth: 15-16.5'

Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School
Project No: E83701.01
Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.1	6.9	17.3	28.8	45.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	98.9		
#8	93.7		
#16	86.4		
#30	79.0		
#50	69.8		
#100	58.0		
#200	45.9		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.04 D_{60}= 0.168 D_{50}= 0.0950
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

F.M.=1.14

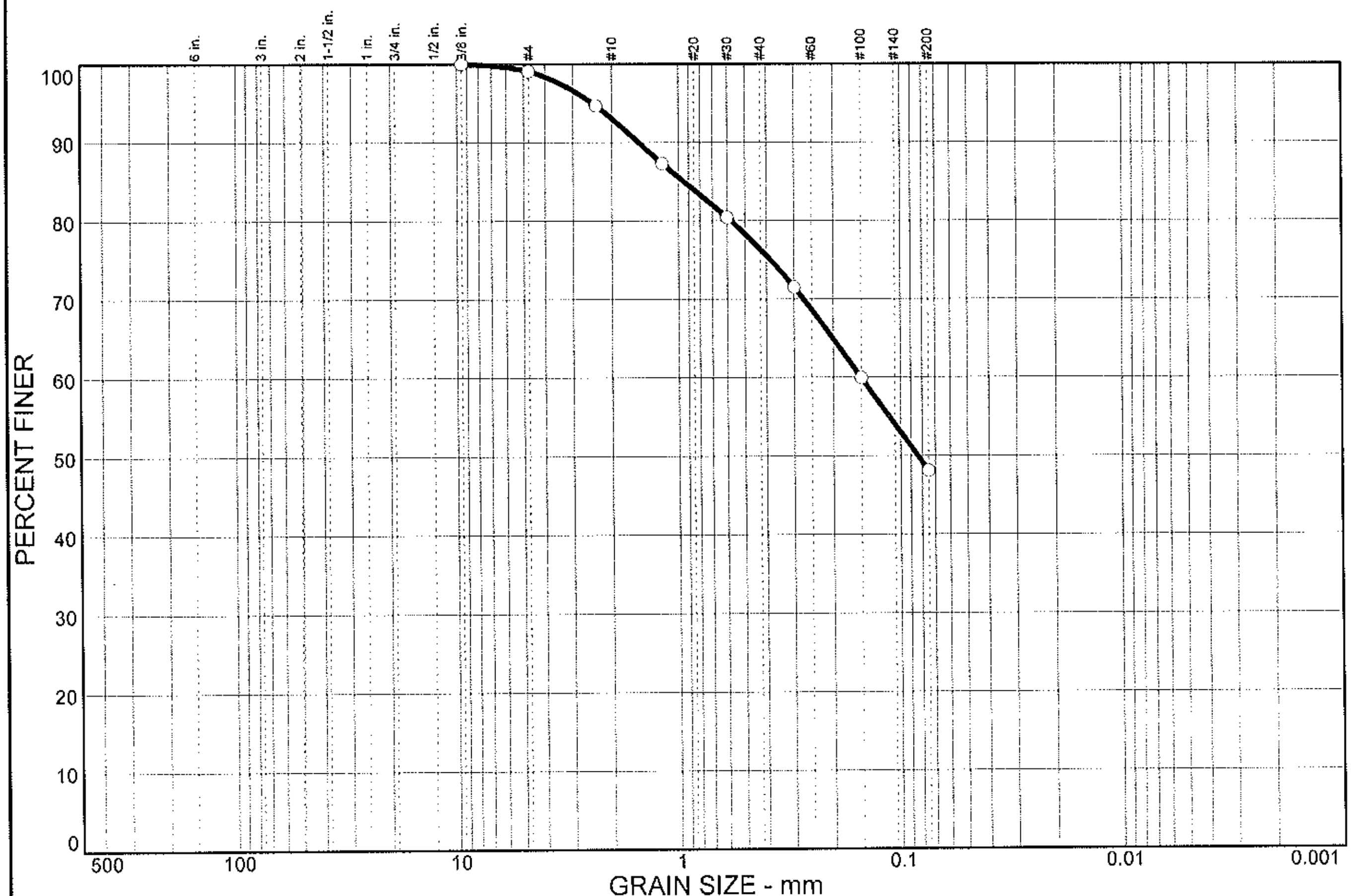
Sample No.: HA-1 **Source of Sample:** San Juan School **Date:** 11/21/12
Location: **Elev./Depth:** 2.5-3'

Moore Twining Associates, Inc.

Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School
Project No: E83701.01 **Figure**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.9	6.0	16.7	28.3	48.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	99.1		
#8	94.7		
#16	87.3		
#30	80.4		
#50	71.5		
#100	59.9		
#200	48.1		

* (no specification provided)

Material Description

Clayey sand

Atterberg Limits

PL= 17 LL= 41 PI= 24

Coefficients

D_{85}= 0.943 D_{60}= 0.151 D_{50}= 0.0839
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SC AASHTO=

Remarks

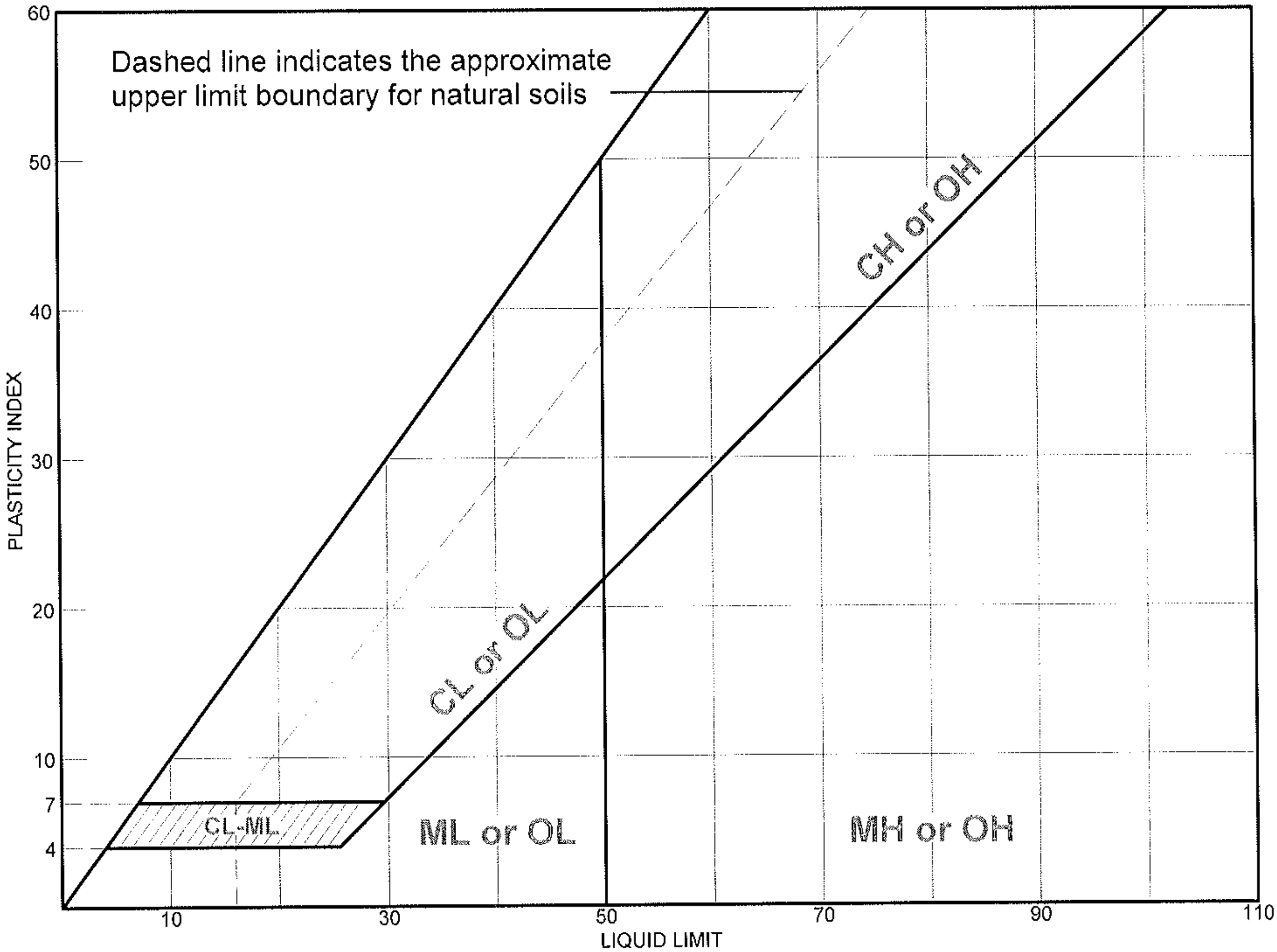
F.M.=1.07

Sample No.: HA-2 **Source of Sample:** San Juan School **Date:** 11/21/12
Location: **Elev./Depth:** 2-2.5'

Moore Twining Associates, Inc.
Fresno, CA

Client:
Project: Fault Trench Investigation at San Juan School
Project No: E83701.01 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		NV	NP	NP			

Project No. E83701.01 **Client:**

Project: San Juan School

● **Source:** San Juan School **Sample No.:** B-1 **Elev./Depth:** 5-6.5'

Remarks:

●

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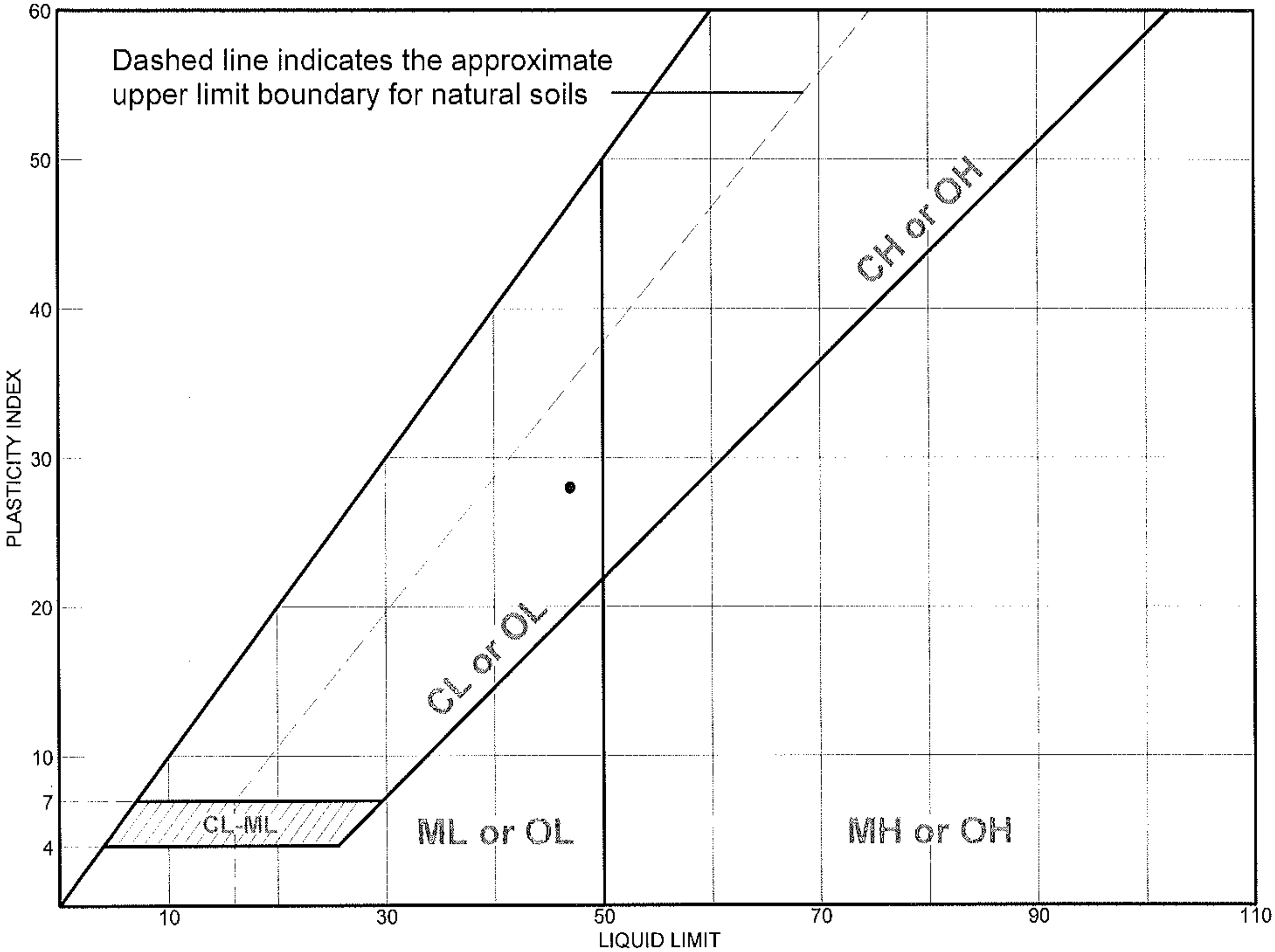
Fresno, CA

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		47	19	28			

Project No. E83701.01 **Client:**
Project: San Juan School

● **Source:** San Juan School **Sample No.:** B-1 **Elev./Depth:** 20-21.5'

Remarks:
●

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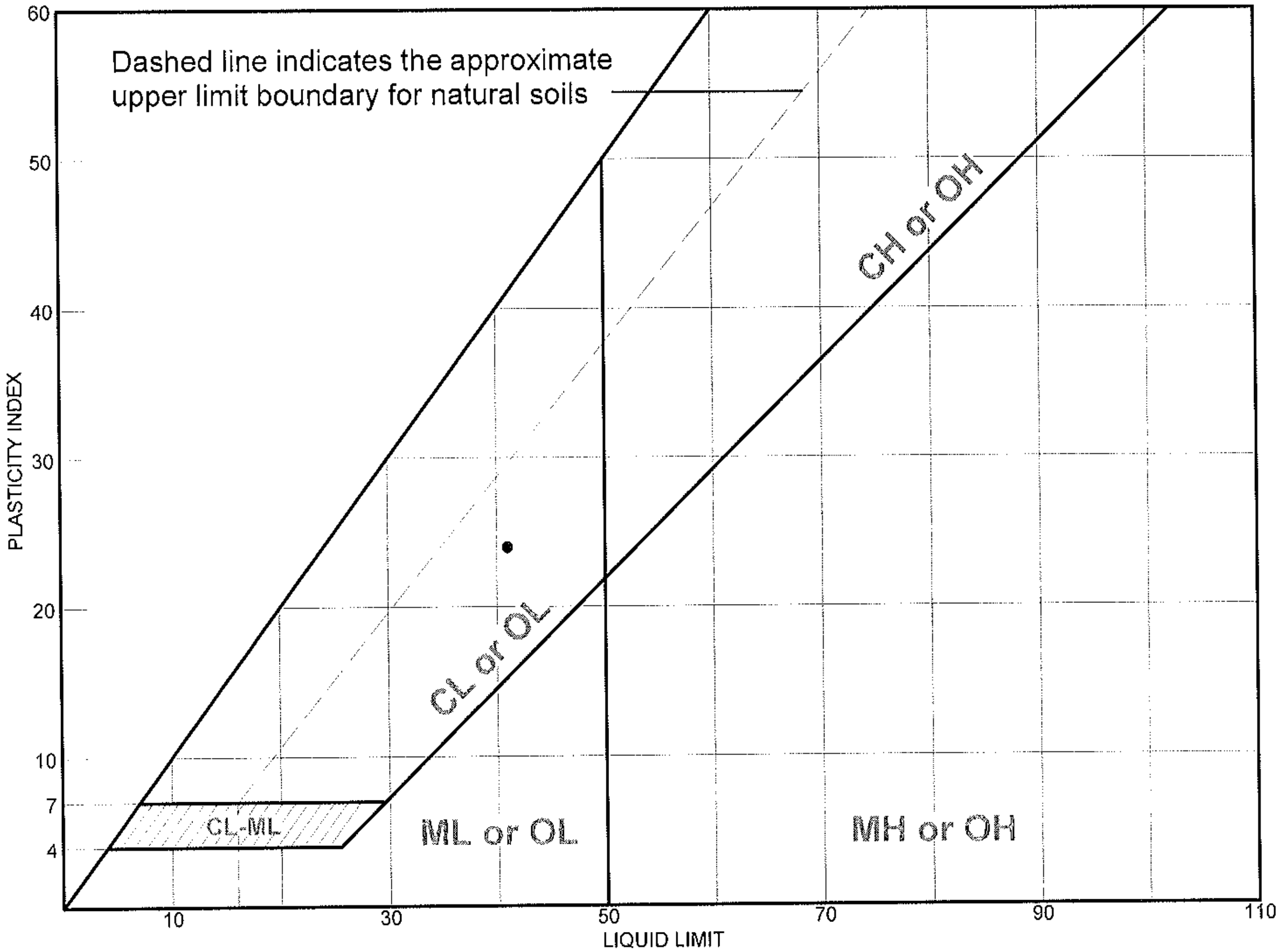
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clayey sand	41	17	24	76.3	48.1	SC

Project No. E83701.01 **Client:**

Project: San Juan School

● **Source:** San Juan School **Sample No.:** HA-2 **Elev./Depth:** 2-2.5'

Remarks:

●

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Figure

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Since 1898

EXPANSION INDEX TEST, ASTM D4829

MTA PROJECT NAME:	San Juan School	REPORT DATE:	12/10/2012
		TEST DATE:	12/6/2012
MTA PROJECT NO.:	E83701.01		
SAMPLE I.D.:	B-1 @ 0.5-2'		
SAMPLED BY:	AR		
SAMPLE DATE:	11/21/2012	TESTED BY:	TD

MATERIALS DESCRIPTION: Fat clay

% PASSING # 4 SIEVE: 100

Initial Moisture Determination:		Final Moisture Determination:	
Pan + Wet Soil Wt., gm	250.0	Wet Soil Wt., lbs	0.9044
Pan + Dry Soil Wt., gm	221.6	Dry Soil Wt., lbs	0.7229
Pan Wt., gm	0.0		
Initial % Moisture Content	12.8	Final % Moisture Content	25.1

Initial Expansion Data:		**Final Expansion Data:**	
Ring + Sample Wt., lbs	0.8156	Ring + Sample Wt., lbs	0.9044
Ring Wt., lbs	0.0000	Ring Wt., lbs	0.0000
Remolded Wt., lbs	0.8156	Remolded Wt., lbs	0.9044
Remolded Wet Density, pcf	112.2	Remolded Wet Density, pcf	116.1
Remolded Dry Density, pcf	99.4	Remolded Dry Density, pcf	92.8

Expansion Data:		Initial Volume	Final Volume
		0.00727222	0.007793
Initial Gage Reading, in:	0.0500		
Final Gage Reading, in:	0.1216		
Expansion, in:	0.0716		
Expansion Index	72	**Comments:**	**(Medium Expansion Potential)**

Classification of Expansive Soils. (Table No.1 From ASTM D4829)

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

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MOORE TWINING ASSOCIATES, INC.

Since 1898

EXPANSION INDEX TEST, ASTM D4829

MTA PROJECT NAME: San Juan School

REPORT DATE: 12/10/2012

TEST DATE: 12/6/2012

MTA PROJECT NO.: E83701.01

SAMPLE I.D.: HA-2 @ 2-2.5'

SAMPLED BY: AR

SAMPLE DATE: 11/21/2012

TESTED BY: TD

MATERIALS DESCRIPTION: Clayey Sand

% PASSING # 4 SIEVE: 100

Initial Moisture Determination:		Final Moisture Determination:	
Pan + Wet Soil Wt., gm	250.0	Wet Soil Wt., lbs	0.9359
Pan + Dry Soil Wt., gm	225.2	Dry Soil Wt., lbs	0.7682
Pan Wt., gm	0.0		
Initial % Moisture Content	11.0	Final % Moisture Content	21.8

Initial Expansion Data:		**Final Expansion Data:**	
Ring + Sample Wt., lbs	0.8528	Ring + Sample Wt., lbs	0.9359
Ring Wt., lbs	0.0000	Ring Wt., lbs	0.0000
Remolded Wt., lbs	0.8528	Remolded Wt., lbs	0.9359
Remolded Wet Density, pcf	117.3	Remolded Wet Density, pcf	123.6
Remolded Dry Density, pcf	105.6	Remolded Dry Density, pcf	101.5

Expansion Data:		Initial Volume	Final Volume
		0.00727222	0.007571
Initial Gage Reading, in:	0.0500		
Final Gage Reading, in:	0.0911		
Expansion, in:	0.0411		
Expansion Index	41	**Comments:**	**(Low Expansion Potential)**

Classification of Expansive Soils. (Table No.1 From ASTM D4829)

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

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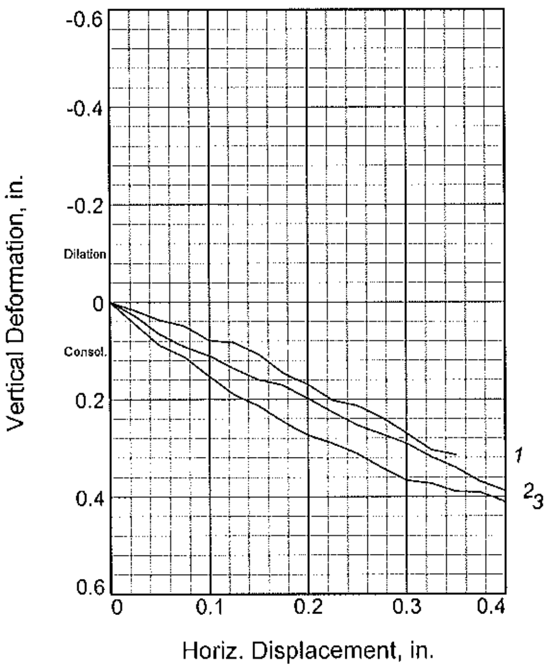
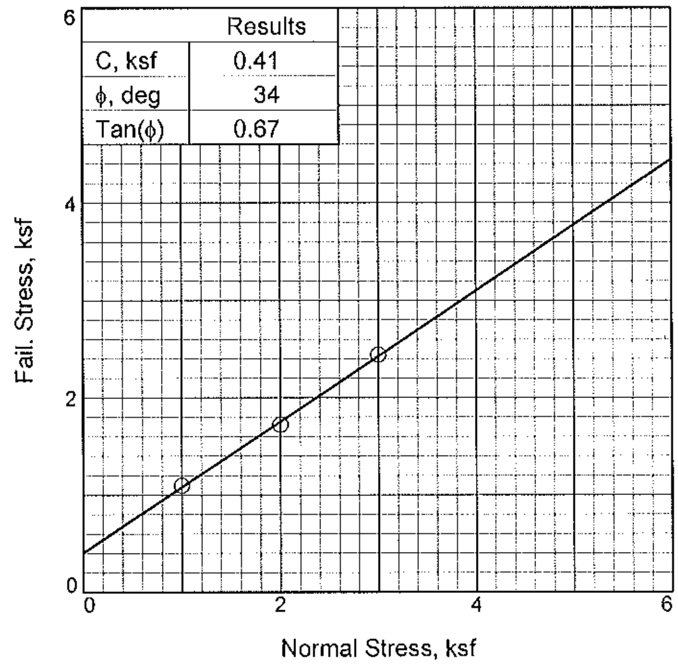
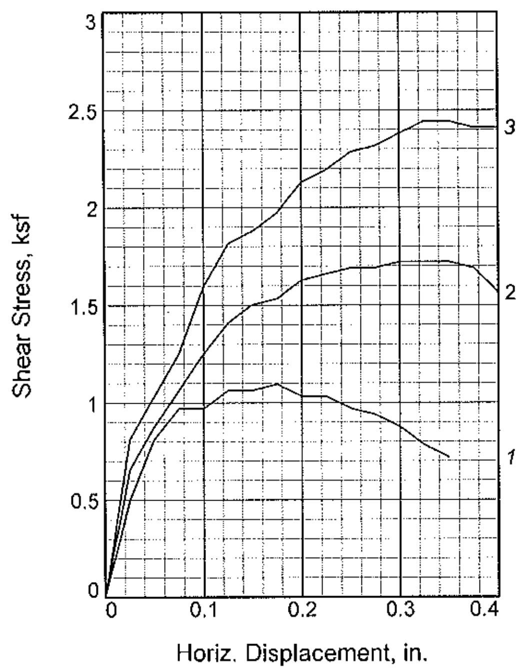




Results	
C, ksf	0.41
ϕ, deg	34
Tan(ϕ)	0.67



	Sample No.	1	2	3
Initial	Water Content, %	16.0	15.3	14.9
	Dry Density, pcf	105.2	107.8	102.0
	Saturation, %	74.0	75.7	63.3
	Void Ratio	0.5728	0.5353	0.6226
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	26.3	26.4	24.0
	Dry Density, pcf	107.8	111.3	106.3
	Saturation, %	130.4	143.7	114.1
	Void Ratio	0.5345	0.4865	0.5566
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.97	0.96
	Normal Stress, ksf	1.00	2.00	3.00
	Fail. Stress, ksf	1.10	1.72	2.44
	Displacement, in.	0.17	0.30	0.33
	Ult. Stress, ksf			
	Displacement, in.			
	Strain at peak, %	7.2	12.4	13.4

Sample Type:
Description:

Assumed Specific Gravity= 2.65
Remarks:

Figure ________

Client:

Project: San Juan School

Source of Sample: San Juan School **Depth:** 5-6.5'
Sample Number: B-2
Proj. No.: E83701.01 **Date Sampled:** 11/21/12

DIRECT SHEAR TEST REPORT

Moore Twining Associates, Inc.

MOORE TWINING ASSOCIATES, INC.

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate# 1371

December 03, 2012

Work Order #: 2K26053

Ken Clark
MTA Geotechnical Division
2527 Fresno Street
Fresno, CA 93721

RE: San Juan School

Enclosed are the analytical results for samples received by our laboratory on 11/26/12 . For your reference, these analyses have been assigned laboratory work order number 2K26053.

All analyses have been performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety. Moore Twining Associates, Inc. (MTA) is not responsible for use of less than complete reports. Results apply only to samples analyzed.

If you have any questions, please feel free to contact us at the number listed above.

Sincerely,

Moore Twining Associates, Inc.

Lisa Montijo

Lisa Montijo
Client Services Assistant

MOORE TWINING ASSOCIATES, INC.

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

California ELAP Certificate# 1371

MTA Geotechnical Division 2527 Fresno Street Fresno CA, 93721	Project: San Juan School Project Number: E83701.01 Project Manager: Ken Clark	**Reported:** 12/03/2012

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B1@1-2	2K26053-01	Soil	11/21/12 21:00	11/26/12 16:10
HA1@2.5-3	2K26053-02	Soil	11/21/12 00:00	11/26/12 16:10

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California ELAP Certificate# 1371

MTA Geotechnical Division
2527 Fresno Street
Fresno CA, 93721

Project: San Juan School
Project Number: E83701.01
Project Manager: Ken Clark

Reported:
12/03/2012

B1@1-2
2K26053-01 (Soil)

Analyte	Result	Reporting Limit	Units	Batch	Prepared	Analyzed	Method	Qualifier
Inorganics								
Chloride	ND	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D-4327-84	
Chloride	ND	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
Sulfate as SO4	**0.0029**	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
pH	**8.4**	0.30	pH Units	T2K2621	11/26/12	11/28/12	ASTM D4972-89 Mod	
Resistivity	**5000**		ohms-cm	T2K2621	11/26/12	11/28/12	ASTM D1125-82	
Sulfate as SO4	**29**	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D4327-84	

MOORE TWINING ASSOCIATES, INC.

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California ELAP Certificate# 1371

MTA Geotechnical Division
2527 Fresno Street
Fresno CA, 93721

Project: San Juan School
Project Number: E83701.01
Project Manager: Ken Clark

Reported:
12/03/2012

HA1@2.5-3

2K26053-02 (Soil)

Analyte	Result	Reporting Limit	Units	Batch	Prepared	Analyzed	Method	Qualifier
Inorganics								
Chloride	ND	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D-4327-84	
Chloride	ND	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
Sulfate as SO4	**0.00073**	0.00060	% by Weight	[CALC]	11/26/12	11/28/12	ASTM D4327-84	
pH	**8.3**	0.30	pH Units	T2K2621	11/26/12	11/28/12	ASTM D4972-89 Mod	
Resistivity	**6100**		ohms-cm	T2K2621	11/26/12	11/28/12	ASTM D1125-82	
Sulfate as SO4	**7.3**	6.0	mg/kg	T2K2621	11/26/12	11/28/12	ASTM D4327-84	

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
RPD	Relative Percent Difference

Moore Twining Associates, Inc.
Juliane Adams, Director of Analytical Chemistry

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

APPENDIX D

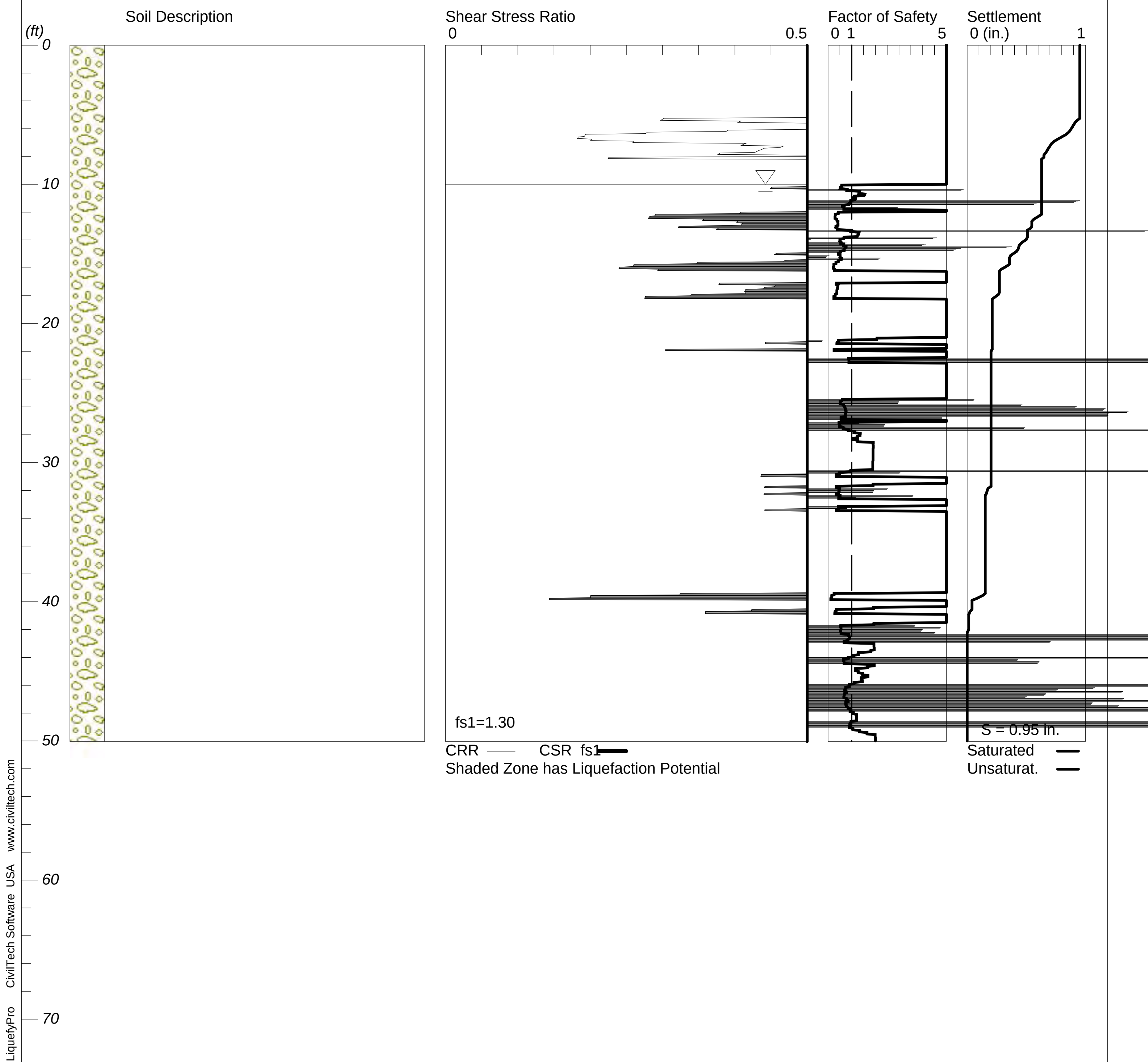
RESULTS OF LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSES

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=CPT-1   Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



Moore Twining Associates, Inc. **E83701.03**

Plate A-1

****

LIQUEFACTION ANALYSIS CALCULATION DETAILS

****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 8/25/2022 4:50:05 PM

Input File Name: UNTITLED
Title: San Juan School
Subtitle: E83701.03

Input Data:

Surface Elev.=
Hole No.=CPT-1
Depth of Hole=50.03 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 19.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	228.71	0.34	0.15	125.00	0.00	0.50
0.98	14.81	0.78	5.27	115.00	0.00	0.50
1.97	15.04	0.53	3.54	115.00	0.00	0.50
2.95	13.77	0.62	4.52	115.00	0.00	0.50
3.94	14.87	0.64	4.28	115.00	0.00	0.50
4.92	23.37	0.64	2.73	115.00	0.00	0.50
5.91	25.71	1.23	4.79	115.00	0.00	0.50
6.89	30.98	0.77	2.49	120.00	0.00	0.50
7.87	19.29	0.82	4.25	115.00	0.00	0.50
8.86	16.40	0.94	5.76	115.00	0.00	0.50
9.84	21.81	1.56	7.16	115.00	0.00	0.50
10.83	103.85	2.78	2.68	120.00	0.00	0.50
11.81	36.00	2.07	5.76	115.00	0.00	0.50
12.80	37.84	1.50	3.97	115.00	0.00	0.50
13.78	149.97	1.24	0.83	125.00	0.00	0.50
14.76	146.46	0.61	0.42	125.00	0.00	0.50
15.75	50.92	1.18	2.31	120.00	0.00	0.50
16.73	7.27	0.80	11.06	100.00	0.00	0.50
17.72	79.34	1.96	2.46	120.00	0.00	0.50
18.70	27.89	0.89	3.21	115.00	0.00	0.50
19.69	21.16	1.57	7.41	115.00	0.00	0.50
20.67	32.75	2.36	7.19	115.00	0.00	0.50
21.65	34.47	1.55	4.50	115.00	0.00	0.50
22.64	81.60	4.01	4.92	115.00	0.00	0.50
23.62	51.52	2.61	5.07	115.00	0.00	0.50
24.61	31.35	1.64	5.23	115.00	0.00	0.50
25.59	118.57	2.94	2.48	120.00	0.00	0.50
26.57	132.46	3.93	2.97	120.00	0.00	0.50
27.56	214.67	2.78	1.29	125.00	0.00	0.50
28.54	317.71	3.13	0.99	125.00	0.00	0.50
29.53	373.35	2.60	0.70	125.00	0.00	0.50
30.51	255.16	1.98	0.77	125.00	0.00	0.50
31.50	60.37	1.86	3.07	115.00	0.00	0.50
32.48	128.29	2.88	2.25	120.00	0.00	0.50
33.46	45.09	1.89	4.18	115.00	0.00	0.50
34.45	37.98	1.11	2.92	115.00	0.00	0.50
35.43	23.33	0.76	3.28	115.00	0.00	0.50
36.42	23.53	0.92	3.93	115.00	0.00	0.50
37.40	26.16	1.68	6.42	115.00	0.00	0.50
38.39	16.02	0.39	2.46	115.00	0.00	0.50
39.37	81.22	1.96	2.41	120.00	0.00	0.50
40.35	85.08	1.75	2.06	120.00	0.00	0.50
41.34	78.07	4.77	6.11	115.00	0.00	0.50
42.32	189.39	4.72	2.49	120.00	0.00	0.50
43.31	374.95	2.18	0.58	125.00	0.00	0.50
44.29	224.46	2.77	1.23	125.00	0.00	0.50
45.28	349.41	2.41	0.69	125.00	0.00	0.50
46.26	257.07	1.46	0.57	125.00	0.00	0.50
47.24	206.21	4.03	1.95	120.00	0.00	0.50
48.23	270.01	4.73	1.75	125.00	0.00	0.50
49.21	316.29	3.82	1.21	125.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	125.00	0.000	125.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	115.00	0.058	115.00	0.058	1.00	0.000	1.046	0.68	1.30	0.88
2.00	115.00	0.112	115.00	0.112	1.00	0.000	1.046	0.68	1.30	0.88
3.00	115.00	0.167	115.00	0.167	0.99	0.000	1.046	0.68	1.30	0.88
4.00	115.00	0.221	115.00	0.221	0.99	0.000	1.046	0.67	1.30	0.88
5.00	115.00	0.275	115.00	0.275	0.99	0.000	1.046	0.67	1.30	0.87
6.00	115.00	0.331	115.00	0.331	0.99	0.000	1.046	0.67	1.30	0.87
7.00	120.00	0.387	120.00	0.387	0.98	0.000	1.046	0.67	1.30	0.87
8.00	115.00	0.441	115.00	0.441	0.98	0.000	1.046	0.67	1.30	0.87
9.00	115.00	0.495	115.00	0.495	0.98	0.000	1.046	0.67	1.30	0.87
10.00	115.00	0.550	52.60	0.550	0.98	0.000	1.046	0.66	1.30	0.86
11.00	120.00	0.606	57.60	0.577	0.97	0.000	1.046	0.70	1.30	0.91
12.00	115.00	0.661	52.60	0.602	0.97	0.000	1.046	0.73	1.30	0.94
13.00	115.00	0.717	52.60	0.628	0.97	0.000	1.046	0.75	1.30	0.98
14.00	125.00	0.775	62.60	0.657	0.97	0.000	1.046	0.78	1.30	1.01
15.00	125.00	0.834	62.60	0.687	0.97	0.000	1.046	0.80	1.30	1.04
16.00	120.00	0.891	57.60	0.714	0.96	0.000	1.046	0.82	1.30	1.06
17.00	115.00	0.945	52.60	0.738	0.96	0.000	1.046	0.84	1.30	1.09
18.00	120.00	1.000	57.60	0.764	0.96	0.000	1.046	0.85	1.30	1.11
19.00	115.00	1.055	52.60	0.789	0.96	0.000	1.046	0.87	1.30	1.13
20.00	115.00	1.109	52.60	0.814	0.95	0.000	1.046	0.88	1.30	1.15
21.00	115.00	1.163	52.60	0.839	0.95	0.000	1.046	0.90	1.30	1.17
22.00	115.00	1.218	52.60	0.864	0.95	0.000	1.046	0.91	1.30	1.18
23.00	115.00	1.272	52.60	0.889	0.95	0.000	1.046	0.92	1.30	1.20
24.00	115.00	1.326	52.60	0.914	0.94	0.000	1.046	0.93	1.30	1.21
25.00	115.00	1.381	52.60	0.938	0.94	0.000	1.046	0.94	1.30	1.22
26.00	125.00	1.436	62.60	0.965	0.94	0.000	1.046	0.95	1.30	1.24
27.00	115.00	1.494	52.60	0.992	0.94	0.000	1.046	0.96	1.30	1.25
28.00	125.00	1.551	62.60	1.020	0.93	0.000	1.046	0.97	1.30	1.26
29.00	125.00	1.610	62.60	1.049	0.93	0.000	1.046	0.97	1.30	1.26
30.00	125.00	1.669	62.60	1.079	0.93	0.000	1.046	0.98	1.30	1.27
31.00	120.00	1.728	57.60	1.108	0.92	0.000	1.046	0.98	1.30	1.27
32.00	125.00	1.783	62.60	1.135	0.91	0.000	1.046	0.98	1.30	1.27
33.00	115.00	1.840	52.60	1.162	0.91	0.000	1.046	0.98	1.30	1.27
34.00	115.00	1.894	52.60	1.186	0.90	0.000	1.046	0.97	1.30	1.27
35.00	115.00	1.948	52.60	1.211	0.89	0.000	1.046	0.97	1.30	1.26
36.00	115.00	2.003	52.60	1.236	0.88	0.000	1.046	0.97	1.30	1.26
37.00	115.00	2.057	52.60	1.261	0.87	0.000	1.046	0.97	1.30	1.26
38.00	115.00	2.111	52.60	1.286	0.86	0.000	1.046	0.97	1.30	1.26
39.00	115.00	2.166	52.60	1.311	0.86	0.000	1.046	0.96	1.30	1.25
40.00	115.00	2.221	52.60	1.337	0.85	0.000	1.046	0.96	1.30	1.25
41.00	115.00	2.277	52.60	1.363	0.84	0.000	1.046	0.95	1.30	1.24
42.00	125.00	2.332	62.60	1.389	0.83	0.000	1.046	0.95	1.30	1.24
43.00	125.00	2.390	62.60	1.417	0.82	0.000	1.046	0.95	1.30	1.23
44.00	125.00	2.449	62.60	1.446	0.82	0.000	1.046	0.94	1.30	1.22
45.00	125.00	2.508	62.60	1.476	0.81	0.000	1.046	0.93	1.30	1.21
46.00	125.00	2.567	62.60	1.505	0.80	0.000	1.046	0.93	1.30	1.21
47.00	125.00	2.626	62.60	1.535	0.79	0.000	1.046	0.92	1.30	1.20
48.00	125.00	2.683	62.60	1.563	0.78	0.000	1.046	0.91	1.30	1.19
49.00	115.00	2.741	52.60	1.591	0.78	0.000	1.046	0.91	1.30	1.18
50.00	125.00	2.799	62.60	1.619	0.77	0.000	1.046	0.90	1.30	1.17

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	2.29E7	0.15	3.91						
0.00	228.71	0.34	1.00	2.29E7	0.15	3.91	1.00	NoLiq	1.00	228.71	228.71	2.08
1.00			1.00	2.54E2	5.29	2.22						
1.00			0.50	6.15E1	5.29	2.57						
1.00	14.81	0.78	0.50	6.15E1	5.29	2.57	4.15	33.91	0.77	61.49	269.53	1.90
2.00			1.00	1.33E2	3.57	2.23						
2.00			0.50	4.49E1	3.57	2.54						
2.00	15.04	0.53	0.50	4.49E1	3.57	2.54	2.98	32.45	0.73	44.87	168.06	0.52
3.00			1.00	8.16E1	4.57	2.44						
3.00			0.50	3.37E1	4.57	2.70						
3.00			0.70	4.83E1	4.57	2.59						
3.00	13.77	0.62	0.70	4.83E1	4.57	2.59	3.50	35.05	0.80	48.26	241.30	1.39
4.00			1.00	6.63E1	4.35	2.48						
4.00			0.50	3.16E1	4.35	2.71						
4.00			0.70	4.28E1	4.35	2.61						
4.00	14.87	0.64	0.70	4.28E1	4.35	2.61	2.88	36.05	0.80	42.77	213.87	0.99
5.00			1.00	8.39E1	2.76	2.27						
5.00			0.50	4.45E1	2.76	2.47						
5.00	23.37	0.64	0.50	4.45E1	2.76	2.47	1.91	29.14	0.64	44.53	125.33	0.26
6.00			1.00	7.68E1	4.85	2.48						
6.00			0.50	4.47E1	4.85	2.63						

6.00			0.70	5.58E1	4.85	2.57						
6.00	25.71	1.23	0.70	5.58E1	4.85	2.57	2.17	33.88	0.77	55.80	243.90	1.43
7.00			1.00	7.91E1	2.52	2.26						
7.00			0.50	4.98E1	2.52	2.40						
7.00	30.98	0.77	0.50	4.98E1	2.52	2.40	1.61	26.49	0.57	49.82	116.89	0.23
8.00			1.00	4.27E1	4.35	2.61						
8.00	19.29	0.82	1.00	4.27E1	4.35	2.61	1.00	NoLiq	1.00	19.29	19.29	2.08
9.00			1.00	3.21E1	5.93	2.80						
9.00	16.40	0.94	1.00	3.21E1	5.93	2.80	1.00	NoLiq	1.00	16.40	16.40	2.08
10.00			1.00	3.87E1	7.34	2.81						
10.00	21.81	1.56	1.00	3.87E1	7.34	2.81	1.00	NoLiq	1.00	21.81	21.81	2.08
11.00			1.00	1.59E2	3.13	2.13						
11.00			0.50	1.25E2	3.13	2.20						
11.00	97.14	3.02	0.50	1.25E2	3.13	2.20	1.28	18.91	0.37	124.77	198.48	0.81
12.00			1.00	5.77E1	3.85	2.49						
12.00			0.50	4.78E1	3.85	2.54						
12.00	38.85	1.47	0.50	4.78E1	3.85	2.54	1.23	32.63	0.74	47.77	182.14	0.64
13.00			1.00	5.96E1	3.01	2.40						
13.00			0.50	5.13E1	3.01	2.45						
13.00	43.46	1.29	0.50	5.13E1	3.01	2.45	1.18	28.33	0.62	51.33	136.09	0.31
14.00			1.00	1.71E2	0.75	1.65						
14.00			0.50	1.51E2	0.75	1.69						
14.00	133.31	0.99	0.50	1.51E2	0.75	1.69	1.14	5.94	0.03	151.41	155.32	0.43
15.00			1.00	1.51E2	0.87	1.73						
15.00			0.50	1.39E2	0.87	1.76						
15.00	126.96	1.09	0.50	1.39E2	0.87	1.76	1.09	7.32	0.06	139.00	148.18	0.38
16.00			1.00	7.38E1	1.61	2.14						
16.00			0.50	7.06E1	1.61	2.16						
16.00	66.66	1.06	0.50	7.06E1	1.61	2.16	1.06	17.65	0.34	70.61	106.63	0.19
17.00			1.00	1.00E1	13.50	3.41						
17.00	10.41	1.28	1.00	1.00E1	13.50	3.41	1.00	NoLiq	1.00	10.41	10.41	2.08
18.00			1.00	7.53E1	2.17	2.23						
18.00			0.50	7.63E1	2.17	2.22						
18.00	76.32	1.64	0.50	7.63E1	2.17	2.22	1.00	19.80	0.40	76.31	126.18	0.27
19.00			1.00	2.52E1	3.16	2.69						
19.00	27.60	0.84	1.00	2.52E1	3.16	2.69	1.00	NoLiq	1.00	27.60	27.60	2.08
20.00			1.00	3.20E1	6.30	2.82						
20.00	35.69	2.18	1.00	3.20E1	6.30	2.82	1.00	NoLiq	1.00	35.69	35.69	2.08
21.00			1.00	3.86E1	6.71	2.78						
21.00	43.84	2.86	1.00	3.86E1	6.71	2.78	1.00	NoLiq	1.00	43.84	43.84	2.08
22.00			1.00	3.50E1	4.74	2.70						
22.00	40.80	1.88	1.00	3.50E1	4.74	2.70	1.00	NoLiq	1.00	40.80	40.80	2.08
23.00			1.00	5.20E1	6.56	2.69						
23.00	61.34	3.94	1.00	5.20E1	6.56	2.69	1.00	NoLiq	1.00	61.34	61.34	2.08
24.00			1.00	3.22E1	5.04	2.75						
24.00	39.39	1.92	1.00	3.22E1	5.04	2.75	1.00	NoLiq	1.00	39.39	39.39	2.08
25.00			1.00	2.24E1	7.70	2.99						
25.00	28.42	2.08	1.00	2.24E1	7.70	2.99	1.00	NoLiq	1.00	28.42	28.42	2.08
26.00			1.00	1.59E2	1.16	1.80						
26.00			0.50	1.78E2	1.16	1.77						
26.00	197.68	2.27	0.50	1.78E2	1.16	1.77	0.90	7.50	0.07	178.13	190.90	0.73
27.00			1.00	4.66E1	4.71	2.61						
27.00	60.13	2.76	1.00	4.66E1	4.71	2.61	1.00	NoLiq	1.00	60.13	60.13	2.08
28.00			1.00	2.16E2	0.84	1.61						
28.00			0.50	2.46E2	0.84	1.57						
28.00	279.48	2.33	0.50	2.46E2	0.84	1.57	0.88	3.91	0.00	246.38	246.38	1.47
29.00			1.00	3.00E2	0.80	1.50						
29.00			0.50	3.45E2	0.80	1.46						
29.00	395.87	3.16	0.50	3.45E2	0.80	1.46	0.87	2.29	0.00	345.04	345.04	2.08
30.00			1.00	2.60E2	0.93	1.59						
30.00			0.50	3.03E2	0.93	1.55						
30.00	351.53	3.25	0.50	3.03E2	0.93	1.55	0.86	3.50	0.00	303.01	303.01	2.08
31.00			1.00	6.70E1	2.60	2.32						
31.00			0.50	8.01E1	2.60	2.26						
31.00	93.88	2.39	0.50	8.01E1	2.60	2.26	0.85	21.21	0.43	80.06	141.14	0.34
32.00			1.00	1.18E2	1.38	1.95						
32.00			0.50	1.41E2	1.38	1.90						
32.00	166.74	2.27	0.50	1.41E2	1.38	1.90	0.84	10.27	0.14	140.84	163.93	0.49
33.00			1.00	2.90E1	6.01	2.83						
33.00	43.26	2.49	1.00	2.90E1	6.01	2.83	1.00	NoLiq	1.00	43.26	43.26	2.08
34.00			1.00	2.77E1	3.95	2.72						
34.00	42.11	1.59	1.00	2.77E1	3.95	2.72	1.00	NoLiq	1.00	42.11	42.11	2.08
35.00			1.00	1.60E1	3.54	2.87						
35.00	25.67	0.84	1.00	1.60E1	3.54	2.87	1.00	NoLiq	1.00	25.67	25.67	2.08
36.00			1.00	1.42E1	4.25	2.96						
36.00	23.32	0.91	1.00	1.42E1	4.25	2.96	1.00	NoLiq	1.00	23.32	23.32	2.08
37.00			1.00	1.41E1	5.14	3.02						
37.00	23.65	1.11	1.00	1.41E1	5.14	3.02	1.00	NoLiq	1.00	23.65	23.65	2.08
38.00			1.00	8.58E0	4.46	3.15						
38.00	15.44	0.60	1.00	8.58E0	4.46	3.15	1.00	NoLiq	1.00	15.44	15.44	2.08
39.00			1.00	1.08E1	3.63	3.02						
39.00	19.27	0.62	1.00	1.08E1	3.63	3.02	1.00	NoLiq	1.00	19.27	19.27	2.08
40.00			1.00	1.79E1	2.65	2.76						
40.00	30.93	0.76	1.00	1.79E1	2.65	2.76	1.00	NoLiq	1.00	30.93	30.93	2.08
41.00			1.00	3.28E1	5.63	2.78						
41.00	55.67	3.01	1.00	3.28E1	5.63	2.78	1.00	NoLiq	1.00	55.67	55.67	2.08
42.00			1.00	1.30E2	0.83	1.77						
42.00			0.50	1.70E2	0.83	1.68						
42.00	218.34	1.79	0.50	1.70E2	0.83	1.68	0.78	5.83	0.02	169.69	173.52	0.57
43.00			1.00	2.17E2	0.88	1.63						

43.00			0.50	2.83E2	0.88	1.55						
43.00	367.11	3.21	0.50	2.83E2	0.88	1.55	0.77	3.53	0.00	282.93	282.93	2.08
44.00			1.00	1.57E2	0.91	1.74						
44.00			0.50	2.08E2	0.91	1.65						
44.00	272.06	2.46	0.50	2.08E2	0.91	1.65	0.76	5.19	0.01	207.86	208.94	0.93
45.00			1.00	1.69E2	1.28	1.82						
45.00			0.50	2.25E2	1.28	1.74						
45.00	297.30	3.78	0.50	2.25E2	1.28	1.74	0.76	6.81	0.05	225.21	236.63	1.31
46.00			1.00	1.57E2	0.55	1.59						
46.00			0.50	2.11E2	0.55	1.49						
46.00	281.39	1.53	0.50	2.11E2	0.55	1.49	0.75	2.75	0.00	211.37	211.37	0.96
47.00			1.00	1.33E2	1.31	1.90						
47.00			0.50	1.80E2	1.31	1.81						
47.00	241.84	3.13	0.50	1.80E2	1.31	1.81	0.74	8.24	0.09	180.16	197.25	0.79
48.00			1.00	1.36E2	1.88	2.01						
48.00			0.50	1.85E2	1.88	1.92						
48.00	250.68	4.67	0.50	1.85E2	1.88	1.92	0.74	10.83	0.16	185.32	219.48	1.06
49.00			1.00	5.99E1	4.72	2.54						
49.00			0.50	8.37E1	4.72	2.45						
49.00	114.07	5.25	0.50	8.37E1	4.72	2.45	0.73	28.30	0.62	83.70	221.45	1.09
50.00			1.00	2.03E2	0.66	1.56						
50.00			0.50	2.82E2	0.66	1.46						
50.00	386.62	2.53	0.50	2.82E2	0.66	1.46	0.73	2.24	0.00	281.51	281.51	2.08

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 19.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.00	0.88	5.00 ^
1.00	0.04	1.90	1.00	1.90	1.16	2.20	0.88	5.00
2.00	0.07	0.52	1.00	0.52	1.16	0.60	0.88	5.00
3.00	0.11	1.39	1.00	1.39	1.16	1.61	0.88	5.00
4.00	0.14	0.99	1.00	0.99	1.16	1.15	0.88	5.00
5.00	0.18	0.26	1.00	0.26	1.16	0.30	0.87	5.00
6.00	0.21	1.43	1.00	1.43	1.16	1.66	0.87	5.00
7.00	0.25	0.23	1.00	0.23	1.16	0.26	0.87	5.00
8.00	0.29	2.08	1.00	2.08	1.16	2.00	0.87	5.00 ^
9.00	0.32	2.08	1.00	2.08	1.16	2.00	0.87	5.00 ^
10.00	0.36	2.08	1.00	2.08	1.16	2.00	0.86	5.00 ^
11.00	0.39	0.81	1.00	0.81	1.16	0.94	0.91	1.03
12.00	0.43	0.64	1.00	0.64	1.16	0.74	0.94	0.79 *
13.00	0.47	0.31	1.00	0.31	1.16	0.36	0.98	0.37 *
14.00	0.50	0.43	1.00	0.43	1.16	0.50	1.01	0.49 *
15.00	0.54	0.38	1.00	0.38	1.16	0.44	1.04	0.43 *
16.00	0.58	0.19	1.00	0.19	1.16	0.22	1.06	0.21 *
17.00	0.61	2.08	1.00	2.08	1.16	2.00	1.09	5.00 ^
18.00	0.65	0.27	1.00	0.27	1.16	0.31	1.11	0.28 *
19.00	0.69	2.08	1.00	2.08	1.16	2.00	1.13	5.00 ^
20.00	0.70	2.08	1.00	2.08	1.16	2.00	1.15	5.00 ^
21.00	0.72	2.08	1.00	2.08	1.16	2.00	1.17	5.00 ^
22.00	0.73	2.08	1.00	2.08	1.16	2.00	1.18	5.00 ^
23.00	0.75	2.08	1.00	2.08	1.16	2.00	1.20	5.00 ^
24.00	0.77	2.08	1.00	2.08	1.16	2.00	1.21	5.00 ^
25.00	0.78	2.08	1.00	2.08	1.16	2.00	1.22	5.00 ^
26.00	0.80	0.73	1.00	0.73	1.16	0.84	1.24	0.68 *
27.00	0.82	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
28.00	0.84	1.47	1.00	1.47	1.16	1.70	1.26	1.36
29.00	0.86	2.08	1.00	2.08	1.16	2.41	1.26	1.91
30.00	0.87	2.08	1.00	2.08	1.16	2.41	1.27	1.90
31.00	0.89	0.34	1.00	0.34	1.16	0.40	1.27	0.31 *
32.00	0.91	0.49	1.00	0.49	1.16	0.57	1.27	0.45 *
33.00	0.93	2.08	1.00	2.08	1.16	2.00	1.27	5.00 ^
34.00	0.94	2.08	1.00	2.08	1.16	2.00	1.27	5.00 ^
35.00	0.96	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
36.00	0.98	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
37.00	0.99	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
38.00	1.01	2.08	1.00	2.09	1.16	2.00	1.26	5.00 ^
39.00	1.03	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
40.00	1.04	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
41.00	1.06	2.08	1.00	2.07	1.16	2.00	1.24	5.00 ^
42.00	1.08	0.57	0.99	0.56	1.16	0.65	1.24	0.53 *
43.00	1.09	2.08	0.99	2.06	1.16	2.39	1.23	1.94
44.00	1.11	0.93	0.99	0.92	1.16	1.06	1.22	0.87 *
45.00	1.13	1.31	0.99	1.29	1.16	1.50	1.21	1.23
46.00	1.15	0.96	0.98	0.94	1.16	1.09	1.21	0.91 *
47.00	1.17	0.79	0.98	0.78	1.16	0.90	1.20	0.75 *
48.00	1.19	1.06	0.98	1.04	1.16	1.20	1.19	1.01
49.00	1.21	1.09	0.97	1.06	1.16	1.23	1.18	1.04
50.00	1.23	2.08	0.97	2.02	1.16	2.34	1.17	2.00

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	3.91	1.28	228.71	100.00	NoLiq	0.00	100.00
1.00	2.57	3.75	269.53	71.85	33.91	0.00	71.85
2.00	2.54	3.81	168.06	44.13	32.45	0.00	44.13
3.00	2.59	3.71	241.30	65.08	35.05	0.00	65.08
4.00	2.61	3.67	213.87	58.28	36.05	0.00	58.28
5.00	2.47	3.95	125.33	31.77	29.14	0.00	31.77
6.00	2.57	3.75	243.90	65.00	33.88	0.00	65.00
7.00	2.40	4.06	116.89	28.78	26.49	0.00	28.78
8.00	2.61	3.67	19.29	5.26	NoLiq	0.00	5.26
9.00	2.80	3.33	16.40	4.93	NoLiq	0.00	4.93
10.00	2.81	3.31	21.81	6.59	NoLiq	0.00	6.59
11.00	2.20	4.44	198.48	44.71	18.91	0.00	44.71
12.00	2.54	3.80	182.14	47.91	32.63	0.00	47.91
13.00	2.45	3.98	136.09	34.19	28.33	0.00	34.19
14.00	1.69	5.38	155.32	28.89	5.94	0.00	28.89
15.00	1.76	5.24	148.18	28.25	7.32	0.00	28.25
16.00	2.16	4.51	106.63	23.64	17.65	0.00	23.64
17.00	3.41	2.20	10.41	4.73	NoLiq	0.00	4.73
18.00	2.22	4.39	126.18	28.74	19.80	0.00	28.74
19.00	2.69	3.53	27.60	7.82	NoLiq	0.00	7.82
20.00	2.82	3.29	35.69	10.84	NoLiq	0.00	10.84
21.00	2.78	3.36	43.84	13.05	NoLiq	0.00	13.05
22.00	2.70	3.51	40.80	11.63	NoLiq	0.00	11.63
23.00	2.69	3.53	61.34	17.36	NoLiq	0.00	17.36
24.00	2.75	3.43	39.39	11.50	NoLiq	0.00	11.50
25.00	2.99	2.98	28.42	9.54	NoLiq	0.00	9.54
26.00	1.77	5.23	190.90	36.51	7.50	0.00	36.51
27.00	2.61	3.67	60.13	16.38	NoLiq	0.00	16.38
28.00	1.57	5.60	246.38	44.03	3.91	0.00	44.03
29.00	1.46	5.80	345.04	59.48	2.29	0.00	59.48
30.00	1.55	5.64	303.01	53.68	3.50	0.00	53.68
31.00	2.26	4.32	141.14	32.70	21.21	0.00	32.70
32.00	1.90	5.00	163.93	32.80	10.27	0.00	32.80
33.00	2.83	3.26	43.26	13.25	NoLiq	0.00	13.25
34.00	2.72	3.47	42.11	12.14	NoLiq	0.00	12.14
35.00	2.87	3.19	25.67	8.05	NoLiq	0.00	8.05
36.00	2.96	3.02	23.32	7.72	NoLiq	0.00	7.72
37.00	3.02	2.92	23.65	8.09	NoLiq	0.00	8.09
38.00	3.15	2.68	15.44	5.77	NoLiq	0.00	5.77
39.00	3.02	2.93	19.27	6.58	NoLiq	0.00	6.58
40.00	2.76	3.40	30.93	9.10	NoLiq	0.00	9.10
41.00	2.78	3.37	55.67	16.51	NoLiq	0.00	16.51
42.00	1.68	5.39	173.52	32.21	5.83	0.00	32.21
43.00	1.55	5.64	282.93	50.15	3.53	0.00	50.15
44.00	1.65	5.45	208.94	38.32	5.19	0.00	38.32
45.00	1.74	5.29	236.63	44.71	6.81	0.00	44.71
46.00	1.49	5.74	211.37	36.83	2.75	0.00	36.83
47.00	1.81	5.16	197.25	38.20	8.24	0.00	38.20
48.00	1.92	4.96	219.48	44.29	10.83	0.00	44.29
49.00	2.45	3.98	221.45	55.62	28.30	0.00	55.62
50.00	1.46	5.81	281.51	48.46	2.24	0.00	48.46

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.00	1.17	1.00	1.17	2.00	2.24	48.46	100.00	0.000	0.0E0	0.000	0.000
49.00	1.18	1.00	1.18	1.04	28.30	55.62	100.00	0.000	0.0E0	0.000	0.000
48.00	1.19	1.00	1.19	1.01	10.83	44.29	100.00	0.000	0.0E0	0.000	0.000
47.00	1.20	1.00	1.20	0.75	8.24	38.20	100.00	0.000	0.0E0	0.000	0.000
46.00	1.21	1.00	1.21	0.91	2.75	36.83	100.00	0.000	0.0E0	0.001	0.001
45.00	1.21	1.00	1.21	1.23	6.81	44.71	100.00	0.000	0.0E0	0.000	0.001
44.00	1.22	1.00	1.22	0.87	5.19	38.32	100.00	0.000	0.0E0	0.000	0.001
43.00	1.23	1.00	1.23	1.94	3.53	50.15	100.00	0.000	0.0E0	0.000	0.001
42.00	1.24	1.00	1.24	0.53	5.83	32.21	95.27	0.588	3.5E-3	0.014	0.015
41.00	1.24	1.00	1.24	5.00	NoLiq	16.51	64.17	0.000	0.0E0	0.001	0.016
40.00	1.25	1.00	1.25	5.00	NoLiq	9.10	48.32	0.000	0.0E0	0.066	0.083
39.00	1.25	1.00	1.25	5.00	NoLiq	6.58	41.55	0.000	0.0E0	0.117	0.200
38.00	1.26	1.00	1.26	5.00	NoLiq	5.77	39.14	0.000	0.0E0	0.000	0.200
37.00	1.26	1.00	1.26	5.00	NoLiq	8.09	45.72	0.000	0.0E0	0.000	0.200
36.00	1.26	1.00	1.26	5.00	NoLiq	7.72	44.72	0.000	0.0E0	0.000	0.200
35.00	1.26	1.00	1.26	5.00	NoLiq	8.05	45.61	0.000	0.0E0	0.000	0.200
34.00	1.27	1.00	1.27	5.00	NoLiq	12.14	55.41	0.000	0.0E0	0.000	0.200
33.00	1.27	1.00	1.27	5.00	NoLiq	13.25	57.77	0.000	0.0E0	0.000	0.200
32.00	1.27	1.00	1.27	0.45	10.27	32.80	96.75	0.425	2.6E-3	0.028	0.228
31.00	1.27	1.00	1.27	0.31	21.21	32.70	96.50	0.463	2.8E-3	0.039	0.268
30.00	1.27	1.00	1.27	1.90	3.50	53.68	100.00	0.000	0.0E0	0.011	0.278
29.00	1.26	1.00	1.26	1.91	2.29	59.48	100.00	0.000	0.0E0	0.000	0.278

28.00	1.26	1.00	1.26	1.36	3.91	44.03	100.00	0.000	0.0E0	0.000	0.278
27.00	1.25	1.00	1.25	5.00	NoLiq	16.38	63.92	0.000	0.0E0	0.000	0.278
26.00	1.24	1.00	1.24	0.68	7.50	36.51	100.00	0.000	0.0E0	0.000	0.278
25.00	1.22	1.00	1.22	5.00	NoLiq	9.54	49.42	0.000	0.0E0	0.000	0.278
24.00	1.21	1.00	1.21	5.00	NoLiq	11.50	54.00	0.000	0.0E0	0.000	0.278
23.00	1.20	1.00	1.20	5.00	NoLiq	17.36	65.75	0.000	0.0E0	0.000	0.278
22.00	1.18	1.00	1.18	5.00	NoLiq	11.63	54.30	0.000	0.0E0	0.000	0.278
21.00	1.17	1.00	1.17	5.00	NoLiq	13.05	57.34	0.000	0.0E0	0.000	0.278
20.00	1.15	1.00	1.15	5.00	NoLiq	10.84	52.50	0.000	0.0E0	0.000	0.278
19.00	1.13	1.00	1.13	5.00	NoLiq	7.82	45.00	0.000	0.0E0	0.000	0.278
18.00	1.11	1.00	1.11	0.28	19.80	28.74	87.27	1.438	8.6E-3	0.035	0.313
17.00	1.09	1.00	1.09	5.00	NoLiq	4.73	35.90	0.000	0.0E0	0.031	0.344
16.00	1.06	1.00	1.06	0.21	17.65	23.64	77.16	1.874	1.1E-2	0.022	0.367
15.00	1.04	1.00	1.04	0.43	7.32	28.25	86.24	1.477	8.9E-3	0.083	0.450
14.00	1.01	1.00	1.01	0.49	5.94	28.89	87.61	1.406	8.4E-3	0.108	0.558
13.00	0.98	1.00	0.98	0.37	28.33	34.19	100.00	0.000	0.0E0	0.045	0.603
12.00	0.94	1.00	0.94	0.79	32.63	47.91	100.00	0.000	0.0E0	0.091	0.694
11.00	0.91	1.00	0.91	1.03	18.91	44.71	100.00	0.000	0.0E0	0.000	0.694
10.00	0.86	1.00	0.86	5.00	NoLiq	6.59	41.58	0.000	0.0E0	0.000	0.694

Settlement of Saturated Sands=0.694 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth ft	sigma' atm	sigC' atm	(N1)60s	CSRsf	Gmax atm	g*Ge/Gm	g_eff	ec7.5 %	Cec	ec %	dsz in.	dsp in.	S in.
9.95	0.55	0.36	6.59	0.86	499.61	9.5E-4	1.0000	3.6539	0.95	3.4750	0.00E0	0.000	0.000
9.00	0.50	0.32	4.93	0.87	431.58	9.9E-4	1.0000	4.6774	0.95	4.4482	0.00E0	0.000	0.000
8.00	0.44	0.29	5.26	0.87	416.21	9.2E-4	1.0000	4.4427	0.95	4.2251	0.00E0	0.011	0.011
7.00	0.39	0.25	28.78	0.87	686.30	4.9E-4	1.0000	0.6054	0.95	0.5758	6.91E-3	0.068	0.079
6.00	0.33	0.21	65.00	0.87	832.34	3.5E-4	1.0000	0.3162	0.95	0.3007	3.61E-3	0.160	0.259

Unsaturated Sands from 0-5 feet are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0.259 in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=0.953 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRfs
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1

qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

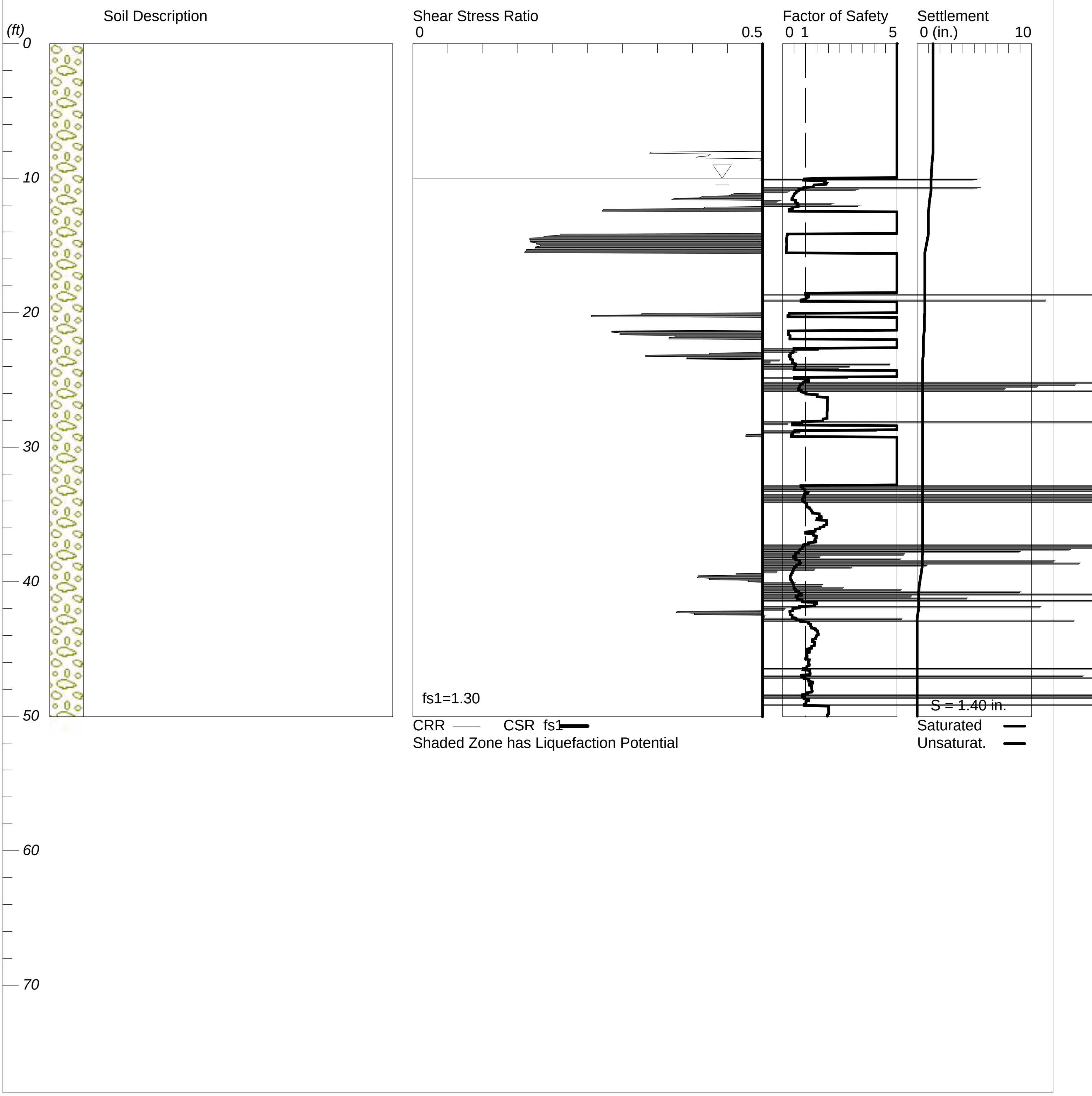
Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=CPT-2 Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Input File Name: UNTITLED
Title: San Juan School
Subtitle: E73801.03

Input Data:

Surface Elev.=
Hole No.=CPT-2
Depth of Hole=50.03 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 19.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	237.73	0.54	0.23	125.00	0.00	0.50
0.98	20.93	0.87	4.17	115.00	0.00	0.50
1.97	19.16	1.09	5.67	115.00	0.00	0.50
2.95	19.45	1.19	6.10	115.00	0.00	0.50
3.94	20.81	1.25	5.99	115.00	0.00	0.50
4.92	103.98	0.50	0.48	125.00	0.00	0.50
5.91	95.36	0.84	0.88	125.00	0.00	0.50
6.89	137.23	0.96	0.70	125.00	0.00	0.50
7.87	87.13	1.27	1.45	125.00	0.00	0.50
8.86	160.92	1.14	0.71	125.00	0.00	0.50
9.84	174.02	1.26	0.73	125.00	0.00	0.50
10.83	135.44	0.93	0.69	125.00	0.00	0.50
11.81	136.76	1.03	0.76	125.00	0.00	0.50
12.80	9.73	0.25	2.61	115.00	0.00	0.50
13.78	13.37	0.77	5.78	115.00	0.00	0.50
14.76	28.38	0.65	2.28	115.00	0.00	0.50
15.75	20.94	0.61	2.91	115.00	0.00	0.50
16.73	11.65	0.35	2.97	115.00	0.00	0.50
17.72	18.55	0.33	1.75	115.00	0.00	0.50
18.70	94.33	4.47	4.74	115.00	0.00	0.50
19.69	29.34	1.84	6.28	115.00	0.00	0.50
20.67	17.51	1.03	5.88	115.00	0.00	0.50
21.65	98.13	1.84	1.87	120.00	0.00	0.50
22.64	65.77	2.64	4.02	115.00	0.00	0.50
23.62	119.53	2.38	1.99	120.00	0.00	0.50
24.61	60.04	3.09	5.14	115.00	0.00	0.50
25.59	197.62	2.21	1.12	125.00	0.00	0.50
26.57	374.02	2.58	0.69	125.00	0.00	0.50
27.56	397.54	1.77	0.44	130.00	0.00	0.50
28.54	39.73	2.93	7.38	115.00	0.00	0.50
29.53	30.51	1.01	3.31	115.00	0.00	0.50
30.51	21.04	0.67	3.17	115.00	0.00	0.50
31.50	16.65	0.48	2.87	115.00	0.00	0.50
32.48	40.33	1.70	4.22	115.00	0.00	0.50
33.46	130.09	5.12	3.93	120.00	0.00	0.50
34.45	286.58	1.66	0.58	125.00	0.00	0.50
35.43	366.69	2.43	0.66	125.00	0.00	0.50
36.42	304.23	2.27	0.74	125.00	0.00	0.50
37.40	260.41	0.89	0.34	125.00	0.00	0.50
38.39	247.76	2.16	0.87	125.00	0.00	0.50
39.37	193.04	0.77	0.40	125.00	0.00	0.50
40.35	215.91	1.64	0.76	125.00	0.00	0.50
41.34	269.24	1.50	0.56	125.00	0.00	0.50
42.32	181.49	1.21	0.67	125.00	0.00	0.50
43.31	315.45	3.02	0.96	125.00	0.00	0.50
44.29	293.83	4.15	1.41	125.00	0.00	0.50
45.28	299.61	1.79	0.60	125.00	0.00	0.50
46.26	302.26	2.70	0.89	125.00	0.00	0.50
47.24	312.47	1.38	0.44	125.00	0.00	0.50
48.23	308.12	1.13	0.37	125.00	0.00	0.50
49.21	376.39	4.80	1.28	125.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	125.00	0.000	125.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	115.00	0.058	115.00	0.058	1.00	0.000	1.046	0.68	1.30	0.88
2.00	115.00	0.113	115.00	0.113	1.00	0.000	1.046	0.68	1.30	0.88
3.00	115.00	0.167	115.00	0.167	0.99	0.000	1.046	0.68	1.30	0.88
4.00	115.00	0.221	115.00	0.221	0.99	0.000	1.046	0.67	1.30	0.88
5.00	125.00	0.278	125.00	0.278	0.99	0.000	1.046	0.67	1.30	0.87
6.00	125.00	0.337	125.00	0.337	0.99	0.000	1.046	0.67	1.30	0.87
7.00	125.00	0.396	125.00	0.396	0.98	0.000	1.046	0.67	1.30	0.87
8.00	125.00	0.455	125.00	0.455	0.98	0.000	1.046	0.67	1.30	0.87
9.00	125.00	0.513	125.00	0.513	0.98	0.000	1.046	0.67	1.30	0.87
10.00	125.00	0.572	62.60	0.572	0.98	0.000	1.046	0.66	1.30	0.86
11.00	125.00	0.631	62.60	0.602	0.97	0.000	1.046	0.69	1.30	0.90
12.00	125.00	0.690	62.60	0.631	0.97	0.000	1.046	0.72	1.30	0.94
13.00	115.00	0.747	52.60	0.658	0.97	0.000	1.046	0.75	1.30	0.97
14.00	115.00	0.801	52.60	0.683	0.97	0.000	1.046	0.77	1.30	1.00
15.00	115.00	0.855	52.60	0.708	0.97	0.000	1.046	0.79	1.30	1.03
16.00	115.00	0.910	52.60	0.733	0.96	0.000	1.046	0.81	1.30	1.06
17.00	115.00	0.964	52.60	0.758	0.96	0.000	1.046	0.83	1.30	1.08
18.00	115.00	1.019	52.60	0.783	0.96	0.000	1.046	0.85	1.30	1.10
19.00	115.00	1.073	52.60	0.808	0.96	0.000	1.046	0.86	1.30	1.12
20.00	115.00	1.127	52.60	0.832	0.95	0.000	1.046	0.88	1.30	1.14
21.00	115.00	1.182	52.60	0.857	0.95	0.000	1.046	0.89	1.30	1.16
22.00	115.00	1.237	52.60	0.883	0.95	0.000	1.046	0.90	1.30	1.17
23.00	120.00	1.292	57.60	0.909	0.95	0.000	1.046	0.91	1.30	1.19
24.00	115.00	1.348	52.60	0.936	0.94	0.000	1.046	0.93	1.30	1.20
25.00	125.00	1.403	62.60	0.961	0.94	0.000	1.046	0.93	1.30	1.22
26.00	125.00	1.462	62.60	0.991	0.94	0.000	1.046	0.94	1.30	1.23
27.00	125.00	1.521	62.60	1.020	0.94	0.000	1.046	0.95	1.30	1.24
28.00	125.00	1.582	62.60	1.051	0.93	0.000	1.046	0.96	1.30	1.24
29.00	120.00	1.638	57.60	1.077	0.93	0.000	1.046	0.96	1.30	1.25
30.00	115.00	1.692	52.60	1.102	0.93	0.000	1.046	0.97	1.30	1.26
31.00	115.00	1.747	52.60	1.127	0.92	0.000	1.046	0.97	1.30	1.26
32.00	115.00	1.801	52.60	1.152	0.91	0.000	1.046	0.97	1.30	1.26
33.00	120.00	1.855	57.60	1.177	0.91	0.000	1.046	0.97	1.30	1.26
34.00	125.00	1.912	62.60	1.205	0.90	0.000	1.046	0.97	1.30	1.26
35.00	125.00	1.971	62.60	1.234	0.89	0.000	1.046	0.97	1.30	1.26
36.00	125.00	2.031	62.60	1.264	0.88	0.000	1.046	0.96	1.30	1.25
37.00	125.00	2.090	62.60	1.293	0.87	0.000	1.046	0.96	1.30	1.25
38.00	125.00	2.149	62.60	1.323	0.86	0.000	1.046	0.95	1.30	1.24
39.00	125.00	2.208	62.60	1.353	0.86	0.000	1.046	0.95	1.30	1.24
40.00	125.00	2.267	62.60	1.382	0.85	0.000	1.046	0.95	1.30	1.23
41.00	125.00	2.326	62.60	1.412	0.84	0.000	1.046	0.94	1.30	1.22
42.00	125.00	2.385	62.60	1.442	0.83	0.000	1.046	0.94	1.30	1.22
43.00	125.00	2.444	62.60	1.471	0.82	0.000	1.046	0.93	1.30	1.21
44.00	125.00	2.503	62.60	1.501	0.82	0.000	1.046	0.93	1.30	1.20
45.00	125.00	2.562	62.60	1.530	0.81	0.000	1.046	0.92	1.30	1.20
46.00	125.00	2.622	62.60	1.560	0.80	0.000	1.046	0.91	1.30	1.19
47.00	125.00	2.681	62.60	1.590	0.79	0.000	1.046	0.91	1.30	1.18
48.00	125.00	2.740	62.60	1.619	0.78	0.000	1.046	0.90	1.30	1.17
49.00	125.00	2.799	62.60	1.649	0.78	0.000	1.046	0.89	1.30	1.16
50.00	125.00	2.858	62.60	1.678	0.77	0.000	1.046	0.89	1.30	1.15

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	2.38E7	0.23	3.95						
0.00	237.73	0.54	1.00	2.38E7	0.23	3.95	1.00	NoLiq	1.00	237.73	237.73	2.08
1.00			1.00	3.58E2	4.18	2.06						
1.00			0.50	8.66E1	4.18	2.40						
1.00	20.93	0.87	0.50	8.66E1	4.18	2.40	4.14	26.22	0.57	86.63	199.82	0.82
2.00			1.00	1.69E2	5.70	2.33						
2.00			0.50	5.71E1	5.70	2.62						
2.00			0.70	8.83E1	5.70	2.50						
2.00	19.16	1.09	0.70	8.83E1	5.70	2.50	4.61	30.48	0.68	88.31	276.31	2.04
3.00			1.00	1.15E2	6.15	2.45						
3.00			0.50	4.76E1	6.15	2.69						
3.00			0.70	6.81E1	6.15	2.59						
3.00	19.45	1.19	0.70	6.81E1	6.15	2.59	3.50	34.94	0.80	68.06	339.24	2.08
4.00			1.00	9.30E1	6.05	2.50						
4.00			0.50	4.42E1	6.05	2.71						
4.00			0.70	5.98E1	6.05	2.62						
4.00	20.81	1.25	0.70	5.98E1	6.05	2.62	2.87	36.44	0.80	59.79	298.97	2.08
5.00			1.00	3.73E2	0.48	1.27						
5.00			0.50	1.97E2	0.48	1.48						
5.00	103.98	0.50	0.50	1.97E2	0.48	1.48	1.90	2.60	0.00	197.21	197.21	0.79
6.00			1.00	2.82E2	0.88	1.55						

6.00			0.50	1.64E2	0.88	1.71						
6.00	95.36	0.84	0.50	1.64E2	0.88	1.71	1.72	6.34	0.04	164.25	170.34	0.54
7.00			1.00	3.45E2	0.70	1.42						
7.00			0.50	2.18E2	0.70	1.55						
7.00	137.23	0.96	0.50	2.18E2	0.70	1.55	1.59	3.64	0.00	218.04	218.04	1.04
8.00			1.00	1.90E2	1.46	1.83						
8.00			0.50	1.29E2	1.46	1.94						
8.00	87.13	1.27	0.50	1.29E2	1.46	1.94	1.48	11.38	0.17	129.14	155.67	0.43
9.00			1.00	3.13E2	0.71	1.45						
9.00			0.50	2.25E2	0.71	1.55						
9.00	160.92	1.14	0.50	2.25E2	0.71	1.55	1.40	3.54	0.00	224.66	224.66	1.13
10.00			1.00	3.03E2	0.73	1.47						
10.00			0.50	2.30E2	0.73	1.55						
10.00	174.02	1.26	0.50	2.30E2	0.73	1.55	1.32	3.55	0.00	230.06	230.06	1.21
11.00			1.00	2.01E2	0.63	1.55						
11.00			0.50	1.61E2	0.63	1.62						
11.00	127.65	0.80	0.50	1.61E2	0.63	1.62	1.26	4.73	0.00	160.67	160.67	0.47
12.00			1.00	1.90E2	1.03	1.71						
12.00			0.50	1.59E2	1.03	1.77						
12.00	131.82	1.35	0.50	1.59E2	1.03	1.77	1.20	7.47	0.07	158.66	169.88	0.54
13.00			1.00	1.26E1	2.77	2.89						
13.00	10.14	0.26	1.00	1.26E1	2.77	2.89	1.00	NoLiq	1.00	10.14	10.14	2.08
14.00			1.00	2.36E1	4.47	2.81						
14.00	19.72	0.85	1.00	2.36E1	4.47	2.81	1.00	NoLiq	1.00	19.72	19.72	2.08
15.00			1.00	3.23E1	2.46	2.54						
15.00			0.50	3.08E1	2.46	2.55						
15.00	28.45	0.68	0.50	3.08E1	2.46	2.55	1.08	33.18	0.75	30.76	124.24	0.26
16.00			1.00	2.49E1	2.56	2.64						
16.00	23.58	0.58	1.00	2.49E1	2.56	2.64	1.00	NoLiq	1.00	23.58	23.58	2.08
17.00			1.00	1.14E1	3.52	2.99						
17.00	11.91	0.38	1.00	1.14E1	3.52	2.99	1.00	NoLiq	1.00	11.91	11.91	2.08
18.00			1.00	1.40E1	3.21	2.89						
18.00	15.32	0.46	1.00	1.40E1	3.21	2.89	1.00	NoLiq	1.00	15.32	15.32	2.08
19.00			1.00	6.60E1	5.65	2.57						
19.00			0.50	6.94E1	5.65	2.56						
19.00	71.85	4.00	0.50	6.94E1	5.65	2.56	0.97	33.34	0.76	69.37	285.04	2.08
20.00			1.00	2.75E1	6.52	2.87						
20.00	31.34	1.97	1.00	2.75E1	6.52	2.87	1.00	NoLiq	1.00	31.34	31.34	2.08
21.00			1.00	1.60E1	6.88	3.06						
21.00	19.19	1.24	1.00	1.60E1	6.88	3.06	1.00	NoLiq	1.00	19.19	19.19	2.08
22.00			1.00	3.96E1	4.61	2.66						
22.00	46.83	2.10	1.00	3.96E1	4.61	2.66	1.00	NoLiq	1.00	46.83	46.83	2.08
23.00			1.00	7.46E1	2.47	2.27						
23.00			0.50	8.21E1	2.47	2.24						
23.00	88.96	2.16	0.50	8.21E1	2.47	2.24	0.92	20.39	0.41	82.06	139.30	0.33
24.00			1.00	7.00E1	3.50	2.40						
24.00			0.50	7.80E1	3.50	2.37						
24.00	85.58	2.95	0.50	7.80E1	3.50	2.37	0.91	25.08	0.54	78.04	168.25	0.52
25.00			1.00	2.03E2	1.02	1.69						
25.00			0.50	2.26E2	1.02	1.66						
25.00	250.48	2.53	0.50	2.26E2	1.02	1.66	0.90	5.37	0.01	226.04	228.27	1.19
26.00			1.00	1.86E2	1.13	1.75						
26.00			0.50	2.10E2	1.13	1.71						
26.00	235.88	2.65	0.50	2.10E2	1.13	1.71	0.89	6.38	0.04	210.35	218.37	1.05
27.00			1.00	3.12E2	0.65	1.42						
27.00			0.50	3.55E2	0.65	1.38						
27.00	402.50	2.61	0.50	3.55E2	0.65	1.38	0.88	1.33	0.00	354.79	354.79	2.08
28.00			1.00	2.33E2	0.58	1.48						
28.00			0.50	2.69E2	0.58	1.43						
28.00	308.79	1.78	0.50	2.69E2	0.58	1.43	0.87	1.91	0.00	269.00	269.00	1.89
29.00			1.00	7.34E1	2.91	2.33						
29.00			0.50	8.65E1	2.91	2.28						
29.00	100.28	2.87	0.50	8.65E1	2.91	2.28	0.86	21.67	0.45	86.49	155.88	0.43
30.00			1.00	2.31E1	2.79	2.68						
30.00	33.37	0.88	1.00	2.31E1	2.79	2.68	1.00	NoLiq	1.00	33.37	33.37	2.08
31.00			1.00	1.35E1	3.68	2.94						
31.00	20.53	0.69	1.00	1.35E1	3.68	2.94	1.00	NoLiq	1.00	20.53	20.53	2.08
32.00			1.00	1.44E1	7.64	3.13						
32.00	22.22	1.56	1.00	1.44E1	7.64	3.13	1.00	NoLiq	1.00	22.22	22.22	2.08
33.00			1.00	8.85E1	3.84	2.36						
33.00			0.50	1.08E2	3.84	2.31						
33.00	129.61	4.90	0.50	1.08E2	3.84	2.31	0.83	22.76	0.47	107.86	205.18	0.88
34.00			1.00	1.60E2	1.45	1.87						
34.00			0.50	1.95E2	1.45	1.82						
34.00	236.66	3.41	0.50	1.95E2	1.45	1.82	0.82	8.49	0.09	195.09	215.11	1.01
35.00			1.00	2.12E2	0.77	1.59						
35.00			0.50	2.61E2	0.77	1.53						
35.00	319.63	2.46	0.50	2.61E2	0.77	1.53	0.82	3.27	0.00	260.88	260.88	1.73
36.00			1.00	2.11E2	0.61	1.52						
36.00			0.50	2.63E2	0.61	1.45						
36.00	324.93	1.96	0.50	2.63E2	0.61	1.45	0.81	2.18	0.00	262.63	262.63	1.76
37.00			1.00	2.00E2	0.36	1.41						
37.00			0.50	2.51E2	0.36	1.32						
37.00	313.88	1.13	0.50	2.51E2	0.36	1.32	0.80	0.65	0.00	251.28	251.28	1.56
38.00			1.00	1.33E2	0.93	1.79						
38.00			0.50	1.70E2	0.93	1.72						
38.00	214.01	1.97	0.50	1.70E2	0.93	1.72	0.79	6.45	0.04	169.73	176.56	0.59
39.00			1.00	1.33E2	0.42	1.59						
39.00			0.50	1.71E2	0.42	1.50						
39.00	217.27	0.91	0.50	1.71E2	0.42	1.50	0.79	2.82	0.00	170.73	170.73	0.54

40.00			1.00	1.18E2	0.55	1.70						
40.00			0.50	1.53E2	0.55	1.60						
40.00	197.03	1.07	0.50	1.53E2	0.55	1.60	0.78	4.43	0.00	153.43	153.43	0.42
41.00			1.00	1.56E2	0.68	1.65						
41.00			0.50	2.04E2	0.68	1.57						
41.00	264.83	1.78	0.50	2.04E2	0.68	1.57	0.77	3.81	0.00	204.40	204.40	0.87
42.00			1.00	1.21E2	0.32	1.57						
42.00			0.50	1.61E2	0.32	1.46						
42.00	209.95	0.67	0.50	1.61E2	0.32	1.46	0.77	2.29	0.00	160.62	160.62	0.47
43.00			1.00	1.68E2	1.09	1.77						
43.00			0.50	2.23E2	1.09	1.69						
43.00	293.67	3.17	0.50	2.23E2	1.09	1.69	0.76	5.84	0.02	222.75	227.86	1.18
44.00			1.00	1.88E2	0.83	1.65						
44.00			0.50	2.52E2	0.83	1.56						
44.00	334.40	2.74	0.50	2.52E2	0.83	1.56	0.75	3.74	0.00	251.51	251.51	1.56
45.00			1.00	1.65E2	0.84	1.70						
45.00			0.50	2.23E2	0.84	1.60						
45.00	299.33	2.49	0.50	2.23E2	0.84	1.60	0.75	4.38	0.00	223.27	223.27	1.12
46.00			1.00	1.67E2	0.65	1.62						
46.00			0.50	2.28E2	0.65	1.52						
46.00	307.74	1.98	0.50	2.28E2	0.65	1.52	0.74	3.09	0.00	227.68	227.68	1.18
47.00			1.00	1.47E2	0.55	1.62						
47.00			0.50	2.02E2	0.55	1.51						
47.00	275.63	1.50	0.50	2.02E2	0.55	1.51	0.73	2.96	0.00	202.29	202.29	0.85
48.00			1.00	1.71E2	0.39	1.48						
48.00			0.50	2.37E2	0.39	1.36						
48.00	326.01	1.27	0.50	2.37E2	0.39	1.36	0.73	1.10	0.00	237.39	237.39	1.32
49.00			1.00	1.51E2	1.09	1.80						
49.00			0.50	2.11E2	1.09	1.70						
49.00	292.46	3.15	0.50	2.11E2	1.09	1.70	0.72	6.12	0.03	211.31	217.80	1.04
50.00			1.00	1.74E2	1.76	1.91						
50.00			0.50	2.45E2	1.76	1.82						
50.00	341.63	5.97	0.50	2.45E2	1.76	1.82	0.72	8.59	0.10	244.95	270.91	1.93

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 19.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.00	0.88	5.00 ^
1.00	0.04	0.82	1.00	0.82	1.16	0.95	0.88	5.00
2.00	0.07	2.04	1.00	2.04	1.16	2.37	0.88	5.00
3.00	0.11	2.08	1.00	2.08	1.16	2.41	0.88	5.00
4.00	0.14	2.08	1.00	2.08	1.16	2.41	0.88	5.00
5.00	0.18	0.79	1.00	0.79	1.16	0.92	0.87	5.00
6.00	0.22	0.54	1.00	0.54	1.16	0.63	0.87	5.00
7.00	0.26	1.04	1.00	1.04	1.16	1.21	0.87	5.00
8.00	0.30	0.43	1.00	0.43	1.16	0.50	0.87	5.00
9.00	0.33	1.13	1.00	1.13	1.16	1.31	0.87	5.00
10.00	0.37	1.21	1.00	1.21	1.16	1.40	0.86	1.63
11.00	0.41	0.47	1.00	0.47	1.16	0.54	0.90	0.60 *
12.00	0.45	0.54	1.00	0.54	1.16	0.62	0.94	0.66 *
13.00	0.49	2.08	1.00	2.08	1.16	2.00	0.97	5.00 ^
14.00	0.52	2.08	1.00	2.08	1.16	2.00	1.00	5.00 ^
15.00	0.56	0.26	1.00	0.26	1.16	0.30	1.03	0.29 *
16.00	0.59	2.08	1.00	2.08	1.16	2.00	1.06	5.00 ^
17.00	0.63	2.08	1.00	2.08	1.16	2.00	1.08	5.00 ^
18.00	0.66	2.08	1.00	2.08	1.16	2.00	1.10	5.00 ^
19.00	0.70	2.08	1.00	2.08	1.16	2.41	1.12	2.15
20.00	0.71	2.08	1.00	2.08	1.16	2.00	1.14	5.00 ^
21.00	0.73	2.08	1.00	2.08	1.16	2.00	1.16	5.00 ^
22.00	0.75	2.08	1.00	2.08	1.16	2.00	1.17	5.00 ^
23.00	0.76	0.33	1.00	0.33	1.16	0.38	1.19	0.32 *
24.00	0.78	0.52	1.00	0.52	1.16	0.61	1.20	0.50 *
25.00	0.80	1.19	1.00	1.19	1.16	1.37	1.22	1.13
26.00	0.82	1.05	1.00	1.05	1.16	1.21	1.23	0.99 *
27.00	0.84	2.08	1.00	2.08	1.16	2.41	1.24	1.95
28.00	0.86	1.89	1.00	1.89	1.16	2.19	1.24	1.76
29.00	0.87	0.43	1.00	0.43	1.16	0.50	1.25	0.40 *
30.00	0.89	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
31.00	0.91	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
32.00	0.92	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
33.00	0.94	0.88	1.00	0.88	1.16	1.02	1.26	0.81 *
34.00	0.96	1.01	1.00	1.01	1.16	1.17	1.26	0.93 *
35.00	0.98	1.73	1.00	1.73	1.16	2.01	1.26	1.60
36.00	0.99	1.76	1.00	1.76	1.16	2.04	1.25	1.63
37.00	1.01	1.56	1.00	1.56	1.16	1.81	1.25	1.45
38.00	1.03	0.59	1.00	0.59	1.16	0.69	1.24	0.55 *
39.00	1.05	0.54	1.00	0.54	1.16	0.63	1.24	0.51 *
40.00	1.07	0.42	0.99	0.41	1.16	0.48	1.23	0.39 *
41.00	1.09	0.87	0.99	0.87	1.16	1.00	1.22	0.82 *
42.00	1.11	0.47	0.99	0.46	1.16	0.53	1.22	0.44 *
43.00	1.13	1.18	0.99	1.16	1.16	1.35	1.21	1.11
44.00	1.15	1.56	0.98	1.53	1.16	1.78	1.20	1.48
45.00	1.17	1.12	0.98	1.09	1.16	1.27	1.20	1.06
46.00	1.19	1.18	0.98	1.15	1.16	1.33	1.19	1.12
47.00	1.21	0.85	0.97	0.83	1.16	0.96	1.18	0.81 *
48.00	1.23	1.32	0.97	1.29	1.16	1.49	1.17	1.27
49.00	1.25	1.04	0.97	1.01	1.16	1.17	1.16	1.00
50.00	1.26	1.93	0.97	1.86	1.16	2.16	1.15	1.87

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	3.95	1.20	237.73	100.00	NoLiq	0.00	100.00
1.00	2.40	4.07	199.82	49.05	26.22	0.00	49.05
2.00	2.50	3.89	276.31	71.05	30.48	0.00	71.05
3.00	2.59	3.71	339.24	91.40	34.94	0.00	91.40
4.00	2.62	3.66	298.97	81.79	36.44	0.00	81.79
5.00	1.48	5.76	197.21	34.24	2.60	0.00	34.24
6.00	1.71	5.34	170.34	31.91	6.34	0.00	31.91
7.00	1.55	5.63	218.04	38.75	3.64	0.00	38.75
8.00	1.94	4.92	155.67	31.67	11.38	0.00	31.67
9.00	1.55	5.64	224.66	39.83	3.54	0.00	39.83
10.00	1.55	5.64	230.06	40.80	3.55	0.00	40.80
11.00	1.62	5.50	160.67	29.20	4.73	0.00	29.20
12.00	1.77	5.23	169.88	32.48	7.47	0.00	32.48
13.00	2.89	3.15	10.14	3.22	NoLiq	0.00	3.22
14.00	2.81	3.31	19.72	5.96	NoLiq	0.00	5.96
15.00	2.55	3.78	124.24	32.87	33.18	0.00	32.87
16.00	2.64	3.63	23.58	6.50	NoLiq	0.00	6.50
17.00	2.99	2.97	11.91	4.01	NoLiq	0.00	4.01
18.00	2.89	3.15	15.32	4.86	NoLiq	0.00	4.86
19.00	2.56	3.77	285.04	75.54	33.34	0.00	75.54
20.00	2.87	3.19	31.34	9.83	NoLiq	0.00	9.83
21.00	3.06	2.85	19.19	6.74	NoLiq	0.00	6.74
22.00	2.66	3.59	46.83	13.03	NoLiq	0.00	13.03
23.00	2.24	4.36	139.30	31.96	20.39	0.00	31.96
24.00	2.37	4.13	168.25	40.77	25.08	0.00	40.77
25.00	1.66	5.43	228.27	42.00	5.37	0.00	42.00
26.00	1.71	5.33	218.37	40.94	6.38	0.00	40.94
27.00	1.38	5.94	354.79	59.70	1.33	0.00	59.70
28.00	1.43	5.86	269.00	45.94	1.91	0.00	45.94
29.00	2.28	4.29	155.88	36.31	21.67	0.00	36.31
30.00	2.68	3.54	33.37	9.43	NoLiq	0.00	9.43
31.00	2.94	3.06	20.53	6.71	NoLiq	0.00	6.71
32.00	3.13	2.72	22.22	8.15	NoLiq	0.00	8.15
33.00	2.31	4.24	205.18	48.41	22.76	0.00	48.41
34.00	1.82	5.14	215.11	41.83	8.49	0.00	41.83
35.00	1.53	5.67	260.88	45.98	3.27	0.00	45.98
36.00	1.45	5.82	262.63	45.15	2.18	0.00	45.15
37.00	1.32	6.05	251.28	41.51	0.65	0.00	41.51
38.00	1.72	5.33	176.56	33.15	6.45	0.00	33.15
39.00	1.50	5.73	170.73	29.80	2.82	0.00	29.80
40.00	1.60	5.54	153.43	27.71	4.43	0.00	27.71
41.00	1.57	5.61	204.40	36.45	3.81	0.00	36.45
42.00	1.46	5.80	160.62	27.68	2.29	0.00	27.68
43.00	1.69	5.39	227.86	42.31	5.84	0.00	42.31
44.00	1.56	5.62	251.51	44.79	3.74	0.00	44.79
45.00	1.60	5.54	223.27	40.30	4.38	0.00	40.30
46.00	1.52	5.70	227.68	39.98	3.09	0.00	39.98
47.00	1.51	5.71	202.29	35.42	2.96	0.00	35.42
48.00	1.36	5.98	237.39	39.70	1.10	0.00	39.70
49.00	1.70	5.36	217.80	40.65	6.12	0.00	40.65
50.00	1.82	5.13	270.91	52.77	8.59	0.00	52.77

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.00	1.15	1.00	1.15	1.87	8.59	52.77	100.00	0.000	0.0E0	0.000	0.000
49.00	1.16	1.00	1.16	1.00	6.12	40.65	100.00	0.000	0.0E0	0.000	0.000
48.00	1.17	1.00	1.17	1.27	1.10	39.70	100.00	0.000	0.0E0	0.000	0.000
47.00	1.18	1.00	1.18	0.81	2.96	35.42	100.00	0.000	0.0E0	0.000	0.000
46.00	1.19	1.00	1.19	1.12	3.09	39.98	100.00	0.000	0.0E0	0.000	0.000
45.00	1.20	1.00	1.20	1.06	4.38	40.30	100.00	0.000	0.0E0	0.000	0.000
44.00	1.20	1.00	1.20	1.48	3.74	44.79	100.00	0.000	0.0E0	0.000	0.000
43.00	1.21	1.00	1.21	1.11	5.84	42.31	100.00	0.000	0.0E0	0.000	0.000
42.00	1.22	1.00	1.22	0.44	2.29	27.68	85.05	1.527	9.2E-3	0.135	0.135
41.00	1.22	1.00	1.22	0.82	3.81	36.45	100.00	0.000	0.0E0	0.011	0.146
40.00	1.23	1.00	1.23	0.39	4.43	27.71	85.11	1.530	9.2E-3	0.089	0.235
39.00	1.24	1.00	1.24	0.51	2.82	29.80	89.60	1.300	7.8E-3	0.187	0.421
38.00	1.24	1.00	1.24	0.55	6.45	33.15	97.65	0.281	1.7E-3	0.047	0.469
37.00	1.25	1.00	1.25	1.45	0.65	41.51	100.00	0.000	0.0E0	0.009	0.477
36.00	1.25	1.00	1.25	1.63	2.18	45.15	100.00	0.000	0.0E0	0.000	0.477
35.00	1.26	1.00	1.26	1.60	3.27	45.98	100.00	0.000	0.0E0	0.000	0.477
34.00	1.26	1.00	1.26	0.93	8.49	41.83	100.00	0.000	0.0E0	0.000	0.477
33.00	1.26	1.00	1.26	0.81	22.76	48.41	100.00	0.000	0.0E0	0.000	0.477
32.00	1.26	1.00	1.26	5.00	NoLiq	8.15	45.89	0.000	0.0E0	0.000	0.477
31.00	1.26	1.00	1.26	5.00	NoLiq	6.71	41.92	0.000	0.0E0	0.000	0.477
30.00	1.26	1.00	1.26	5.00	NoLiq	9.43	49.14	0.000	0.0E0	0.000	0.477
29.00	1.25	1.00	1.25	0.40	21.67	36.31	100.00	0.000	0.0E0	0.000	0.477
28.00	1.24	1.00	1.24	1.76	1.91	45.94	100.00	0.000	0.0E0	0.000	0.477
27.00	1.24	1.00	1.24	1.95	1.33	59.70	100.00	0.000	0.0E0	0.000	0.477
26.00	1.23	1.00	1.23	0.99	6.38	40.94	100.00	0.000	0.0E0	0.000	0.477
25.00	1.22	1.00	1.22	1.13	5.37	42.00	100.00	0.000	0.0E0	0.000	0.477
24.00	1.20	1.00	1.20	0.50	25.08	40.77	100.00	0.000	0.0E0	0.000	0.477
23.00	1.19	1.00	1.19	0.32	20.39	31.96	94.65	0.707	4.2E-3	0.096	0.574
22.00	1.17	1.00	1.17	5.00	NoLiq	13.03	57.31	0.000	0.0E0	0.000	0.574

21.00	1.16	1.00	1.16	5.00	NoLiq	6.74	42.02	0.000	0.0E0	0.081	0.654
20.00	1.14	1.00	1.14	5.00	NoLiq	9.83	50.12	0.000	0.0E0	0.000	0.654
19.00	1.12	1.00	1.12	2.15	33.34	75.54	100.00	0.000	0.0E0	0.000	0.654
18.00	1.10	1.00	1.10	5.00	NoLiq	4.86	36.32	0.000	0.0E0	0.000	0.654
17.00	1.08	1.00	1.08	5.00	NoLiq	4.01	33.52	0.000	0.0E0	0.000	0.654
16.00	1.06	1.00	1.06	5.00	NoLiq	6.50	41.30	0.000	0.0E0	0.000	0.654
15.00	1.03	1.00	1.03	0.29	33.18	32.87	96.94	0.405	2.4E-3	0.097	0.751
14.00	1.00	1.00	1.00	5.00	NoLiq	5.96	39.72	0.000	0.0E0	0.113	0.864
13.00	0.97	1.00	0.97	5.00	NoLiq	3.22	30.79	0.000	0.0E0	0.000	0.864
12.00	0.94	1.00	0.94	0.66	7.47	32.48	95.94	0.411	2.5E-3	0.067	0.931
11.00	0.90	1.00	0.90	0.60	4.73	29.20	88.28	1.211	7.3E-3	0.165	1.096
10.00	0.86	1.00	0.86	1.63	3.55	40.80	100.00	0.000	0.0E0	0.013	1.109

Settlement of Saturated Sands=1.109 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.
9.95	0.57	0.37	40.90	0.86	936.05	5.2E-4	1.0000	0.3162	0.95	0.3007	3.61E-3	0.004	0.178
9.00	0.51	0.33	39.83	0.87	880.93	5.0E-4	1.0000	0.3192	0.95	0.3035	3.64E-3	0.067	0.288

Unsaturated Sands from 0-8 feet are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0.288in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.397 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5

Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
   SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

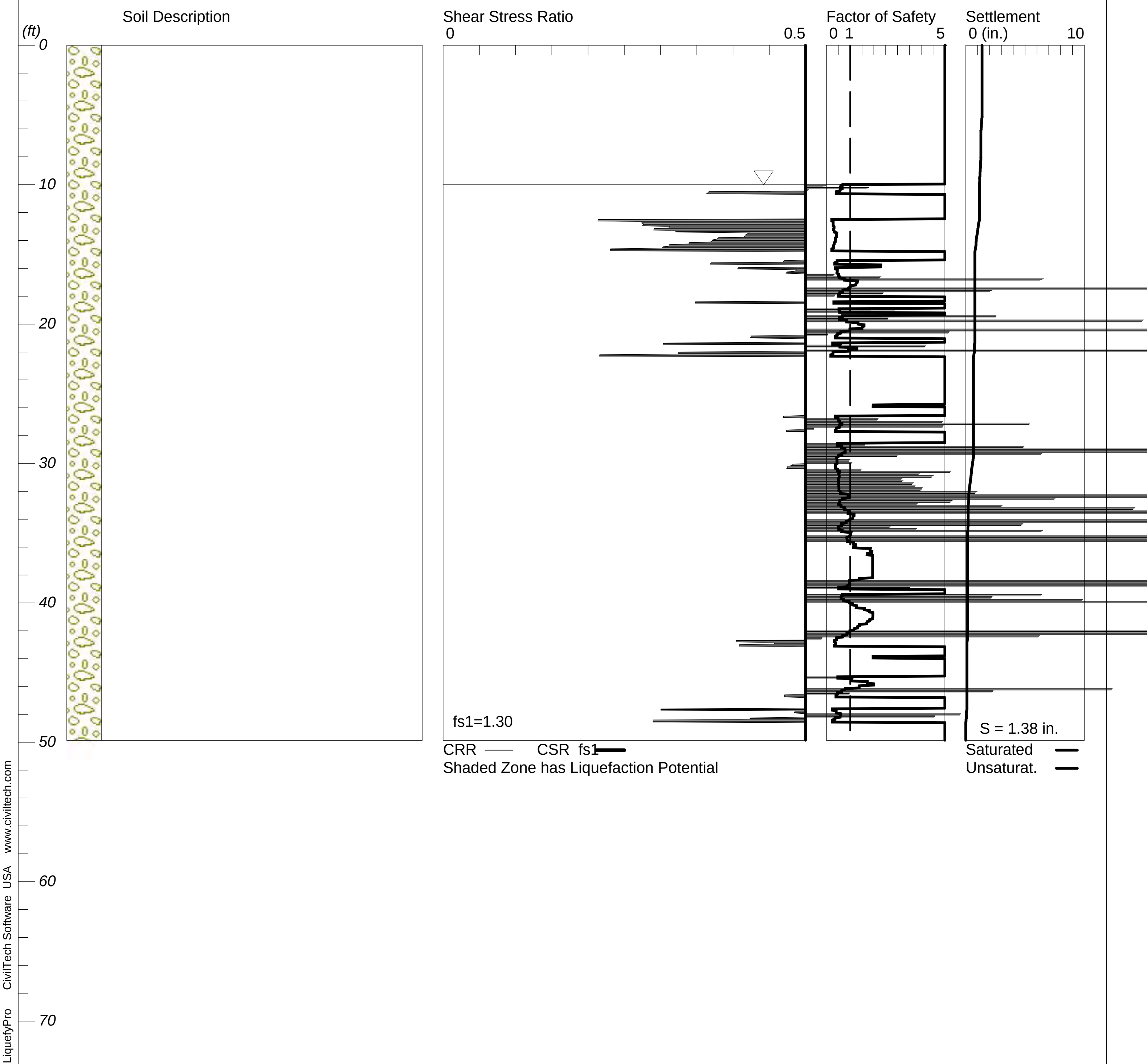
Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=CPT-3   Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



Moore Twining Associates, Inc. **E83701.03**

Plate A-1

****

LIQUEFACTION ANALYSIS CALCULATION DETAILS

****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 8/26/2022 10:31:10 AM

Input File Name: UNTITLED
Title: San Juan School
Subtitle: E83701.03

Input Data:

Surface Elev.=
Hole No.=CPT-3
Depth of Hole=49.87 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 19.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	428.17	0.79	0.18	130.00	0.00	0.50
0.98	63.76	3.16	4.95	120.00	0.00	0.50
1.97	100.20	1.36	1.35	125.00	0.00	0.50
2.95	124.55	1.03	0.83	125.00	0.00	0.50
3.94	107.34	0.66	0.62	125.00	0.00	0.50
4.92	78.26	0.80	1.02	125.00	0.00	0.50
5.91	84.56	1.23	1.45	125.00	0.00	0.50
6.89	57.87	2.34	4.04	115.00	0.00	0.50
7.87	80.29	2.48	3.09	120.00	0.00	0.50
8.86	79.78	3.68	4.61	120.00	0.00	0.50
9.84	96.05	1.68	1.75	120.00	0.00	0.50
10.83	17.18	0.54	3.16	115.00	0.00	0.50
11.81	27.46	1.63	5.95	115.00	0.00	0.50
12.80	63.13	1.13	1.79	120.00	0.00	0.50
13.78	90.55	1.45	1.60	120.00	0.00	0.50
14.76	27.53	1.24	4.50	115.00	0.00	0.50
15.75	35.08	1.49	4.26	115.00	0.00	0.50
16.73	182.87	1.57	0.86	125.00	0.00	0.50
17.72	109.77	2.60	2.37	120.00	0.00	0.50
18.70	76.93	1.76	2.29	120.00	0.00	0.50
19.69	194.71	2.30	1.18	125.00	0.00	0.50
20.67	103.04	2.52	2.45	120.00	0.00	0.50
21.65	253.22	1.56	0.62	125.00	0.00	0.50
22.64	27.09	0.79	2.92	115.00	0.00	0.50
23.62	18.73	0.47	2.53	115.00	0.00	0.50
24.61	24.70	0.73	2.94	115.00	0.00	0.50
25.59	25.63	0.44	1.74	115.00	0.00	0.50
26.57	84.95	2.46	2.89	120.00	0.00	0.50
27.56	66.49	2.39	3.60	115.00	0.00	0.50
28.54	125.23	2.87	2.29	120.00	0.00	0.50
29.53	184.07	1.35	0.73	125.00	0.00	0.50
30.51	210.12	1.13	0.54	125.00	0.00	0.50
31.50	206.53	0.70	0.34	125.00	0.00	0.50
32.48	230.15	0.66	0.29	125.00	0.00	0.50
33.46	259.94	2.02	0.78	125.00	0.00	0.50
34.45	208.25	1.17	0.56	125.00	0.00	0.50
35.43	260.45	1.68	0.64	125.00	0.00	0.50
36.42	334.23	3.05	0.91	125.00	0.00	0.50
37.40	376.92	2.19	0.58	125.00	0.00	0.50
38.39	201.52	4.91	2.44	120.00	0.00	0.50
39.37	149.04	4.20	2.82	120.00	0.00	0.50
40.35	331.11	3.83	1.16	125.00	0.00	0.50
41.34	346.60	1.70	0.49	125.00	0.00	0.50
42.32	250.74	0.87	0.35	125.00	0.00	0.50
43.31	39.00	1.54	3.96	115.00	0.00	0.50
44.29	40.92	2.38	5.82	115.00	0.00	0.50
45.28	173.46	2.90	1.67	125.00	0.00	0.50
46.26	173.31	4.04	2.33	120.00	0.00	0.50
47.24	49.91	2.35	4.70	115.00	0.00	0.50
48.23	134.22	2.68	2.00	120.00	0.00	0.50
49.21	27.08	0.48	1.77	115.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	130.00	0.000	130.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	120.00	0.060	120.00	0.060	1.00	0.000	1.046	0.68	1.30	0.88
2.00	125.00	0.117	125.00	0.117	1.00	0.000	1.046	0.68	1.30	0.88
3.00	125.00	0.177	125.00	0.177	0.99	0.000	1.046	0.68	1.30	0.88
4.00	125.00	0.236	125.00	0.236	0.99	0.000	1.046	0.67	1.30	0.88
5.00	125.00	0.295	125.00	0.295	0.99	0.000	1.046	0.67	1.30	0.87
6.00	125.00	0.354	125.00	0.354	0.99	0.000	1.046	0.67	1.30	0.87
7.00	115.00	0.409	115.00	0.409	0.98	0.000	1.046	0.67	1.30	0.87
8.00	120.00	0.465	120.00	0.465	0.98	0.000	1.046	0.67	1.30	0.87
9.00	120.00	0.522	120.00	0.522	0.98	0.000	1.046	0.67	1.30	0.87
10.00	120.00	0.578	57.60	0.578	0.98	0.000	1.046	0.66	1.30	0.86
11.00	115.00	0.633	52.60	0.604	0.97	0.000	1.046	0.69	1.30	0.90
12.00	115.00	0.688	52.60	0.629	0.97	0.000	1.046	0.72	1.30	0.94
13.00	120.00	0.743	57.60	0.655	0.97	0.000	1.046	0.75	1.30	0.97
14.00	120.00	0.801	57.60	0.683	0.97	0.000	1.046	0.77	1.30	1.00
15.00	115.00	0.857	52.60	0.710	0.97	0.000	1.046	0.79	1.30	1.03
16.00	115.00	0.911	52.60	0.734	0.96	0.000	1.046	0.81	1.30	1.06
17.00	125.00	0.969	62.60	0.762	0.96	0.000	1.046	0.83	1.30	1.08
18.00	115.00	1.027	52.60	0.791	0.96	0.000	1.046	0.85	1.30	1.10
19.00	120.00	1.082	57.60	0.817	0.96	0.000	1.046	0.86	1.30	1.12
20.00	125.00	1.138	62.60	0.844	0.95	0.000	1.046	0.87	1.30	1.14
21.00	115.00	1.196	52.60	0.872	0.95	0.000	1.046	0.89	1.30	1.15
22.00	120.00	1.254	57.60	0.900	0.95	0.000	1.046	0.90	1.30	1.17
23.00	115.00	1.308	52.60	0.925	0.95	0.000	1.046	0.91	1.30	1.18
24.00	115.00	1.363	52.60	0.950	0.94	0.000	1.046	0.92	1.30	1.20
25.00	115.00	1.417	52.60	0.975	0.94	0.000	1.046	0.93	1.30	1.21
26.00	115.00	1.472	52.60	1.000	0.94	0.000	1.046	0.94	1.30	1.22
27.00	125.00	1.528	62.60	1.026	0.94	0.000	1.046	0.95	1.30	1.23
28.00	115.00	1.584	52.60	1.053	0.93	0.000	1.046	0.96	1.30	1.24
29.00	125.00	1.640	62.60	1.079	0.93	0.000	1.046	0.96	1.30	1.25
30.00	125.00	1.699	62.60	1.109	0.93	0.000	1.046	0.97	1.30	1.26
31.00	125.00	1.758	62.60	1.139	0.92	0.000	1.046	0.97	1.30	1.26
32.00	125.00	1.817	62.60	1.168	0.91	0.000	1.046	0.97	1.30	1.26
33.00	125.00	1.876	62.60	1.198	0.91	0.000	1.046	0.96	1.30	1.25
34.00	125.00	1.935	62.60	1.227	0.90	0.000	1.046	0.96	1.30	1.25
35.00	125.00	1.994	62.60	1.257	0.89	0.000	1.046	0.96	1.30	1.25
36.00	125.00	2.053	62.60	1.286	0.88	0.000	1.046	0.96	1.30	1.24
37.00	125.00	2.112	62.60	1.316	0.87	0.000	1.046	0.95	1.30	1.24
38.00	125.00	2.172	62.60	1.346	0.86	0.000	1.046	0.95	1.30	1.23
39.00	115.00	2.229	52.60	1.374	0.86	0.000	1.046	0.95	1.30	1.23
40.00	125.00	2.285	62.60	1.400	0.85	0.000	1.046	0.94	1.30	1.22
41.00	125.00	2.344	62.60	1.430	0.84	0.000	1.046	0.94	1.30	1.22
42.00	125.00	2.403	62.60	1.459	0.83	0.000	1.046	0.93	1.30	1.21
43.00	115.00	2.461	52.60	1.488	0.82	0.000	1.046	0.93	1.30	1.20
44.00	115.00	2.516	52.60	1.514	0.82	0.000	1.046	0.92	1.30	1.20
45.00	115.00	2.571	52.60	1.538	0.81	0.000	1.046	0.92	1.30	1.19
46.00	125.00	2.628	62.60	1.567	0.80	0.000	1.046	0.91	1.30	1.19
47.00	115.00	2.685	52.60	1.594	0.79	0.000	1.046	0.91	1.30	1.18
48.00	125.00	2.741	62.60	1.620	0.78	0.000	1.046	0.90	1.30	1.17
49.00	115.00	2.796	52.60	1.646	0.78	0.000	1.046	0.90	1.30	1.16

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	4.28E7	0.18	4.19						
0.00	428.17	0.79	1.00	4.28E7	0.18	4.19	1.00	NoLiq	1.00	428.17	428.17	2.08
1.00			1.00	1.07E3	4.96	1.97						
1.00			0.50	2.61E2	4.96	2.19						
1.00	63.76	3.16	0.50	2.61E2	4.96	2.19	4.10	18.52	0.36	261.28	408.87	2.08
2.00			1.00	8.52E2	1.35	1.46						
2.00			0.50	2.92E2	1.35	1.68						
2.00	100.20	1.36	0.50	2.92E2	1.35	1.68	2.92	5.82	0.02	292.39	298.92	2.08
3.00			1.00	7.05E2	0.83	1.30						
3.00			0.50	2.96E2	0.83	1.51						
3.00	124.55	1.03	0.50	2.96E2	0.83	1.51	2.38	3.04	0.00	296.46	296.46	2.08
4.00			1.00	4.55E2	0.62	1.30						
4.00			0.50	2.21E2	0.62	1.51						
4.00	107.34	0.66	0.50	2.21E2	0.62	1.51	2.06	3.01	0.00	221.16	221.16	1.09
5.00			1.00	2.65E2	1.02	1.61						
5.00			0.50	1.44E2	1.02	1.80						
5.00	78.26	0.80	0.50	1.44E2	1.02	1.80	1.84	8.06	0.08	144.18	157.02	0.44
6.00			1.00	2.38E2	1.46	1.76						
6.00			0.50	1.42E2	1.46	1.91						
6.00	84.56	1.23	0.50	1.42E2	1.46	1.91	1.68	10.65	0.15	142.18	167.42	0.52
7.00			1.00	1.41E2	4.07	2.26						
7.00			0.50	9.05E1	4.07	2.37						

7.00	57.87	2.34	0.50	9.05E1	4.07	2.37	1.56	25.37	0.54	90.50	198.40	0.81
8.00			1.00	1.72E2	3.11	2.11						
8.00			0.50	1.18E2	3.11	2.21						
8.00	80.29	2.48	0.50	1.18E2	3.11	2.21	1.47	19.38	0.38	117.73	191.13	0.73
9.00			1.00	1.52E2	4.64	2.28						
9.00			0.50	1.10E2	4.64	2.37						
9.00	79.78	3.68	0.50	1.10E2	4.64	2.37	1.38	25.02	0.53	110.44	237.25	1.32
10.00			1.00	1.65E2	1.76	1.93						
10.00			0.50	1.26E2	1.76	2.01						
10.00	96.05	1.68	0.50	1.26E2	1.76	2.01	1.32	13.09	0.22	126.32	161.14	0.47
11.00			1.00	2.57E1	3.43	2.71						
11.00	16.93	0.56	1.00	2.57E1	3.43	2.71	1.00	NoLiq	1.00	16.93	16.93	2.08
12.00			1.00	3.89E1	6.36	2.76						
12.00	27.46	1.70	1.00	3.89E1	6.36	2.76	1.00	NoLiq	1.00	27.46	27.46	2.08
13.00			1.00	6.80E1	2.59	2.31						
13.00			0.50	5.94E1	2.59	2.35						
13.00	51.25	1.31	0.50	5.94E1	2.59	2.35	1.16	24.57	0.52	59.45	124.53	0.26
14.00			1.00	7.76E1	2.58	2.27						
14.00			0.50	7.03E1	2.58	2.30						
14.00	62.94	1.60	0.50	7.03E1	2.58	2.30	1.12	22.56	0.47	70.32	132.40	0.30
15.00			1.00	2.15E1	6.87	2.97						
15.00	19.30	1.27	1.00	2.15E1	6.87	2.97	1.00	NoLiq	1.00	19.30	19.30	2.08
16.00			1.00	6.29E1	3.16	2.40						
16.00			0.50	6.10E1	3.16	2.41						
16.00	58.22	1.81	0.50	6.10E1	3.16	2.41	1.05	26.71	0.58	60.99	145.11	0.36
17.00			1.00	2.33E2	0.63	1.50						
17.00			0.50	2.30E2	0.63	1.51						
17.00	226.31	1.42	0.50	2.30E2	0.63	1.51	1.02	2.93	0.00	229.93	229.93	1.21
18.00			1.00	6.69E1	3.52	2.41						
18.00			0.50	6.89E1	3.52	2.41						
18.00	69.78	2.42	0.50	6.89E1	3.52	2.41	0.99	26.63	0.58	68.86	162.94	0.48
19.00			1.00	1.02E2	2.39	2.17						
19.00			0.50	1.07E2	2.39	2.15						
19.00	111.11	2.63	0.50	1.07E2	2.39	2.15	0.96	17.45	0.33	106.82	160.01	0.46
20.00			1.00	2.23E2	0.65	1.52						
20.00			0.50	2.36E2	0.65	1.51						
20.00	248.96	1.61	0.50	2.36E2	0.65	1.51	0.95	2.92	0.00	236.25	236.25	1.31
21.00			1.00	4.73E1	3.73	2.54						
21.00			0.50	5.16E1	3.73	2.51						
21.00	55.04	2.01	0.50	5.16E1	3.73	2.51	0.94	31.14	0.70	51.57	170.71	0.54
22.00			1.00	8.53E1	1.55	2.09						
22.00			0.50	9.32E1	1.55	2.06						
22.00	100.71	1.54	0.50	9.32E1	1.55	2.06	0.93	14.61	0.26	93.24	125.43	0.26
23.00			1.00	2.08E1	2.98	2.74						
23.00	26.06	0.74	1.00	2.08E1	2.98	2.74	1.00	NoLiq	1.00	26.06	26.06	2.08
24.00			1.00	1.41E1	3.31	2.90						
24.00	18.49	0.57	1.00	1.41E1	3.31	2.90	1.00	NoLiq	1.00	18.49	18.49	2.08
25.00			1.00	1.49E1	2.35	2.79						
25.00	19.95	0.44	1.00	1.49E1	2.35	2.79	1.00	NoLiq	1.00	19.95	19.95	2.08
26.00			1.00	1.69E1	2.12	2.72						
26.00	22.88	0.45	1.00	1.69E1	2.12	2.72	1.00	NoLiq	1.00	22.88	22.88	2.08
27.00			1.00	1.33E2	1.36	1.91						
27.00			0.50	1.53E2	1.36	1.87						
27.00	173.69	2.33	0.50	1.53E2	1.36	1.87	0.88	9.59	0.12	152.74	174.08	0.57
28.00			1.00	4.00E1	4.87	2.67						
28.00	54.41	2.57	1.00	4.00E1	4.87	2.67	1.00	NoLiq	1.00	54.41	54.41	2.08
29.00			1.00	1.46E2	1.62	1.94						
29.00			0.50	1.71E2	1.62	1.89						
29.00	198.13	3.18	0.50	1.71E2	1.62	1.89	0.86	10.17	0.14	170.76	198.12	0.80
30.00			1.00	1.38E2	0.66	1.69						
30.00			0.50	1.63E2	0.66	1.63						
30.00	191.77	1.25	0.50	1.63E2	0.66	1.63	0.85	4.86	0.00	163.49	163.49	0.49
31.00			1.00	1.47E2	0.43	1.56						
31.00			0.50	1.75E2	0.43	1.50						
31.00	207.91	0.89	0.50	1.75E2	0.43	1.50	0.84	2.78	0.00	175.38	175.38	0.58
32.00			1.00	1.50E2	0.35	1.50						
32.00			0.50	1.82E2	0.35	1.43						
32.00	217.46	0.75	0.50	1.82E2	0.35	1.43	0.83	1.91	0.00	181.53	181.53	0.64
33.00			1.00	1.46E2	0.93	1.77						
33.00			0.50	1.78E2	0.93	1.70						
33.00	215.08	1.98	0.50	1.78E2	0.93	1.70	0.83	6.16	0.03	177.73	183.43	0.65
34.00			1.00	1.79E2	0.44	1.50						
34.00			0.50	2.20E2	0.44	1.42						
34.00	269.03	1.19	0.50	2.20E2	0.44	1.42	0.82	1.81	0.00	220.09	220.09	1.07
35.00			1.00	1.79E2	0.51	1.53						
35.00			0.50	2.23E2	0.51	1.45						
35.00	275.43	1.39	0.50	2.23E2	0.51	1.45	0.81	2.22	0.00	223.13	223.13	1.11
36.00			1.00	1.84E2	0.69	1.60						
36.00			0.50	2.31E2	0.69	1.53						
36.00	287.62	1.96	0.50	2.31E2	0.69	1.53	0.80	3.28	0.00	230.78	230.78	1.22
37.00			1.00	2.47E2	0.47	1.40						
37.00			0.50	3.13E2	0.47	1.32						
37.00	393.81	1.85	0.50	3.13E2	0.47	1.32	0.79	0.64	0.00	313.01	313.01	2.08
38.00			1.00	2.52E2	0.73	1.52						
38.00			0.50	3.21E2	0.73	1.45						
38.00	408.28	2.97	0.50	3.21E2	0.73	1.45	0.79	2.15	0.00	321.49	321.49	2.08
39.00			1.00	5.17E1	4.03	2.53						
39.00			0.50	6.80E1	4.03	2.45						
39.00	87.06	3.42	0.50	6.80E1	4.03	2.45	0.78	28.60	0.63	67.97	183.74	0.66
40.00			1.00	1.43E2	1.62	1.94						

40.00			0.50	1.87E2	1.62	1.87						
40.00	240.80	3.87	0.50	1.87E2	1.62	1.87	0.77	9.61	0.12	186.51	212.66	0.97
41.00			1.00	2.15E2	0.45	1.43						
41.00			0.50	2.82E2	0.45	1.34						
41.00	367.70	1.63	0.50	2.82E2	0.45	1.34	0.77	0.83	0.00	282.31	282.31	2.08
42.00			1.00	1.65E2	0.34	1.46						
42.00			0.50	2.18E2	0.34	1.36						
42.00	286.92	0.96	0.50	2.18E2	0.34	1.36	0.76	1.00	0.00	218.39	218.39	1.05
43.00			1.00	4.51E1	3.18	2.50						
43.00			0.50	6.16E1	3.18	2.41						
43.00	81.62	2.52	0.50	6.16E1	3.18	2.41	0.75	26.69	0.58	61.61	146.36	0.37
44.00			1.00	3.49E1	3.81	2.64						
44.00	64.68	2.37	1.00	3.49E1	3.81	2.64	1.00	NoLiq	1.00	64.68	64.68	2.08
45.00			1.00	3.16E1	5.94	2.80						
45.00	59.70	3.39	1.00	3.16E1	5.94	2.80	1.00	NoLiq	1.00	59.70	59.70	2.08
46.00			1.00	1.80E2	0.66	1.60						
46.00			0.50	2.45E2	0.66	1.50						
46.00	331.97	2.18	0.50	2.45E2	0.66	1.50	0.74	2.84	0.00	245.16	245.16	1.45
47.00			1.00	2.70E1	4.13	2.74						
47.00	52.99	2.08	1.00	2.70E1	4.13	2.74	1.00	NoLiq	1.00	52.99	52.99	2.08
48.00			1.00	1.29E2	0.81	1.77						
48.00			0.50	1.79E2	0.81	1.66						
48.00	246.37	1.98	0.50	1.79E2	0.81	1.66	0.73	5.40	0.01	179.36	181.30	0.63
49.00			1.00	1.46E1	1.86	2.74						
49.00	30.77	0.52	1.00	1.46E1	1.86	2.74	1.00	NoLiq	1.00	30.77	30.77	2.08

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 19.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.00	0.88	5.00 ^
1.00	0.04	2.08	1.00	2.08	1.16	2.41	0.88	5.00
2.00	0.08	2.08	1.00	2.08	1.16	2.41	0.88	5.00
3.00	0.11	2.08	1.00	2.08	1.16	2.41	0.88	5.00
4.00	0.15	1.09	1.00	1.09	1.16	1.26	0.88	5.00
5.00	0.19	0.44	1.00	0.44	1.16	0.51	0.87	5.00
6.00	0.23	0.52	1.00	0.52	1.16	0.60	0.87	5.00
7.00	0.27	0.81	1.00	0.81	1.16	0.93	0.87	5.00
8.00	0.30	0.73	1.00	0.73	1.16	0.85	0.87	5.00
9.00	0.34	1.32	1.00	1.32	1.16	1.53	0.87	5.00
10.00	0.38	0.47	1.00	0.47	1.16	0.54	0.86	0.63 *
11.00	0.41	2.08	1.00	2.08	1.16	2.00	0.90	5.00 ^
12.00	0.45	2.08	1.00	2.08	1.16	2.00	0.94	5.00 ^
13.00	0.48	0.26	1.00	0.26	1.16	0.30	0.97	0.31 *
14.00	0.52	0.30	1.00	0.30	1.16	0.34	1.00	0.34 *
15.00	0.56	2.08	1.00	2.08	1.16	2.00	1.03	5.00 ^
16.00	0.59	0.36	1.00	0.36	1.16	0.42	1.06	0.40 *
17.00	0.63	1.21	1.00	1.21	1.16	1.40	1.08	1.30
18.00	0.67	0.48	1.00	0.48	1.16	0.56	1.10	0.51 *
19.00	0.70	0.46	1.00	0.46	1.16	0.53	1.12	0.48 *
20.00	0.72	1.31	1.00	1.31	1.16	1.51	1.14	1.33
21.00	0.74	0.54	1.00	0.54	1.16	0.63	1.15	0.55 *
22.00	0.76	0.26	1.00	0.26	1.16	0.31	1.17	0.26 *
23.00	0.77	2.08	1.00	2.08	1.16	2.00	1.18	5.00 ^
24.00	0.79	2.08	1.00	2.08	1.16	2.00	1.20	5.00 ^
25.00	0.81	2.08	1.00	2.08	1.16	2.00	1.21	5.00 ^
26.00	0.82	2.08	1.00	2.08	1.16	2.00	1.22	5.00 ^
27.00	0.84	0.57	1.00	0.57	1.16	0.66	1.23	0.54 *
28.00	0.86	2.08	1.00	2.08	1.16	2.00	1.24	5.00 ^
29.00	0.88	0.80	1.00	0.80	1.16	0.93	1.25	0.74 *
30.00	0.89	0.49	1.00	0.49	1.16	0.56	1.26	0.45 *
31.00	0.91	0.58	1.00	0.58	1.16	0.67	1.26	0.54 *
32.00	0.93	0.64	1.00	0.64	1.16	0.74	1.26	0.59 *
33.00	0.95	0.65	1.00	0.65	1.16	0.76	1.25	0.60 *
34.00	0.97	1.07	1.00	1.07	1.16	1.24	1.25	0.99 *
35.00	0.99	1.11	1.00	1.11	1.16	1.29	1.25	1.03
36.00	1.01	1.22	1.00	1.23	1.16	1.42	1.24	1.15
37.00	1.03	2.08	1.00	2.08	1.16	2.41	1.24	1.95
38.00	1.05	2.08	1.00	2.08	1.16	2.41	1.23	1.95
39.00	1.07	0.66	1.00	0.65	1.16	0.76	1.23	0.62 *
40.00	1.08	0.97	0.99	0.97	1.16	1.12	1.22	0.92 *
41.00	1.10	2.08	0.99	2.06	1.16	2.39	1.22	1.96
42.00	1.12	1.05	0.99	1.04	1.16	1.20	1.21	0.99 *
43.00	1.14	0.37	0.98	0.37	1.16	0.42	1.20	0.35 *
44.00	1.16	2.08	0.98	2.04	1.16	2.00	1.20	5.00 ^
45.00	1.17	2.08	0.98	2.04	1.16	2.00	1.19	5.00 ^
46.00	1.19	1.45	0.98	1.42	1.16	1.64	1.19	1.38
47.00	1.21	2.08	0.97	2.03	1.16	2.00	1.18	5.00 ^
48.00	1.23	0.63	0.97	0.62	1.16	0.71	1.17	0.61 *
49.00	1.24	2.08	0.97	2.02	1.16	2.00	1.16	5.00 ^

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	4.19	1.02	428.17	100.00	NoLiq	0.00	100.00
1.00	2.19	4.46	408.87	91.65	18.52	0.00	91.65
2.00	1.68	5.39	298.92	55.47	5.82	0.00	55.47
3.00	1.51	5.70	296.46	52.00	3.04	0.00	52.00
4.00	1.51	5.71	221.16	38.76	3.01	0.00	38.76
5.00	1.80	5.18	157.02	30.32	8.06	0.00	30.32
6.00	1.91	4.97	167.42	33.69	10.65	0.00	33.69
7.00	2.37	4.11	198.40	48.24	25.37	0.00	48.24
8.00	2.21	4.41	191.13	43.31	19.38	0.00	43.31
9.00	2.37	4.13	237.25	57.45	25.02	0.00	57.45
10.00	2.01	4.79	161.14	33.61	13.09	0.00	33.61
11.00	2.71	3.50	16.93	4.84	NoLiq	0.00	4.84
12.00	2.76	3.40	27.46	8.08	NoLiq	0.00	8.08
13.00	2.35	4.15	124.53	30.00	24.57	0.00	30.00
14.00	2.30	4.25	132.40	31.17	22.56	0.00	31.17
15.00	2.97	3.02	19.30	6.39	NoLiq	0.00	6.39
16.00	2.41	4.05	145.11	35.82	26.71	0.00	35.82
17.00	1.51	5.72	229.93	40.22	2.93	0.00	40.22
18.00	2.41	4.06	162.94	40.18	26.63	0.00	40.18
19.00	2.15	4.52	160.01	35.38	17.45	0.00	35.38
20.00	1.51	5.72	236.25	41.32	2.92	0.00	41.32
21.00	2.51	3.86	170.71	44.21	31.14	0.00	44.21
22.00	2.06	4.69	125.43	26.72	14.61	0.00	26.72
23.00	2.74	3.44	26.06	7.58	NoLiq	0.00	7.58
24.00	2.90	3.14	18.49	5.89	NoLiq	0.00	5.89
25.00	2.79	3.34	19.95	5.98	NoLiq	0.00	5.98
26.00	2.72	3.47	22.88	6.60	NoLiq	0.00	6.60
27.00	1.87	5.05	174.08	34.46	9.59	0.00	34.46
28.00	2.67	3.57	54.41	15.25	NoLiq	0.00	15.25
29.00	1.89	5.01	198.12	39.58	10.17	0.00	39.58
30.00	1.63	5.49	163.49	29.79	4.86	0.00	29.79
31.00	1.50	5.74	175.38	30.58	2.78	0.00	30.58
32.00	1.43	5.86	181.53	31.00	1.91	0.00	31.00
33.00	1.70	5.35	183.43	34.26	6.16	0.00	34.26
34.00	1.42	5.87	220.09	37.49	1.81	0.00	37.49
35.00	1.45	5.81	223.13	38.39	2.22	0.00	38.39
36.00	1.53	5.67	230.78	40.69	3.28	0.00	40.69
37.00	1.32	6.06	313.01	51.68	0.64	0.00	51.68
38.00	1.45	5.82	321.49	55.23	2.15	0.00	55.23
39.00	2.45	3.97	183.74	46.30	28.60	0.00	46.30
40.00	1.87	5.05	212.66	42.11	9.61	0.00	42.11
41.00	1.34	6.02	282.31	46.86	0.83	0.00	46.86
42.00	1.36	6.00	218.39	36.42	1.00	0.00	36.42
43.00	2.41	4.05	146.36	36.11	26.69	0.00	36.11
44.00	2.64	3.63	64.68	17.84	NoLiq	0.00	17.84
45.00	2.80	3.32	59.70	17.98	NoLiq	0.00	17.98
46.00	1.50	5.73	245.16	42.81	2.84	0.00	42.81
47.00	2.74	3.43	52.99	15.44	NoLiq	0.00	15.44
48.00	1.66	5.43	181.30	33.38	5.40	0.00	33.38
49.00	2.74	3.43	30.77	8.97	NoLiq	0.00	8.97

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
49.80	1.16	1.00	1.16	5.00	NoLiq	12.40	55.98	0.000	0.0E0	0.000	0.000
49.00	1.16	1.00	1.16	5.00	NoLiq	8.97	48.01	0.000	0.0E0	0.000	0.000
48.00	1.17	1.00	1.17	0.61	5.40	33.38	98.26	0.191	1.1E-3	0.038	0.038
47.00	1.18	1.00	1.18	5.00	NoLiq	15.44	62.14	0.000	0.0E0	0.061	0.100
46.00	1.19	1.00	1.19	1.38	2.84	42.81	100.00	0.000	0.0E0	0.000	0.100
45.00	1.19	1.00	1.19	5.00	NoLiq	17.98	66.87	0.000	0.0E0	0.003	0.103
44.00	1.20	1.00	1.20	5.00	NoLiq	17.84	66.62	0.000	0.0E0	0.000	0.103
43.00	1.20	1.00	1.20	0.35	26.69	36.11	100.00	0.000	0.0E0	0.024	0.127
42.00	1.21	1.00	1.21	0.99	1.00	36.42	100.00	0.000	0.0E0	0.067	0.194
41.00	1.22	1.00	1.22	1.96	0.83	46.86	100.00	0.000	0.0E0	0.000	0.194
40.00	1.22	1.00	1.22	0.92	9.61	42.11	100.00	0.000	0.0E0	0.000	0.194
39.00	1.23	1.00	1.23	0.62	28.60	46.30	100.00	0.000	0.0E0	0.000	0.194
38.00	1.23	1.00	1.23	1.95	2.15	55.23	100.00	0.000	0.0E0	0.000	0.194
37.00	1.24	1.00	1.24	1.95	0.64	51.68	100.00	0.000	0.0E0	0.000	0.194
36.00	1.24	1.00	1.24	1.15	3.28	40.69	100.00	0.000	0.0E0	0.000	0.194
35.00	1.25	1.00	1.25	1.03	2.22	38.39	100.00	0.000	0.0E0	0.000	0.194
34.00	1.25	1.00	1.25	0.99	1.81	37.49	100.00	0.000	0.0E0	0.039	0.233
33.00	1.25	1.00	1.25	0.60	6.16	34.26	100.00	0.000	0.0E0	0.000	0.233
32.00	1.26	1.00	1.26	0.59	1.91	31.00	92.37	0.866	5.2E-3	0.077	0.309
31.00	1.26	1.00	1.26	0.54	2.78	30.58	91.37	1.061	6.4E-3	0.148	0.458
30.00	1.26	1.00	1.26	0.45	4.86	29.79	89.59	1.328	8.0E-3	0.143	0.601
29.00	1.25	1.00	1.25	0.74	10.17	39.58	100.00	0.000	0.0E0	0.085	0.686
28.00	1.24	1.00	1.24	5.00	NoLiq	15.25	61.77	0.000	0.0E0	0.000	0.686
27.00	1.23	1.00	1.23	0.54	9.59	34.46	100.00	0.000	0.0E0	0.000	0.686

26.00	1.22	1.00	1.22	5.00	NoLiq	6.60	41.60	0.000	0.0E0	0.003	0.689
25.00	1.21	1.00	1.21	5.00	NoLiq	5.98	39.77	0.000	0.0E0	0.041	0.729
24.00	1.20	1.00	1.20	5.00	NoLiq	5.89	39.51	0.000	0.0E0	0.000	0.729
23.00	1.18	1.00	1.18	5.00	NoLiq	7.58	44.35	0.000	0.0E0	0.000	0.729
22.00	1.17	1.00	1.17	0.26	14.61	26.72	83.08	1.615	9.7E-3	0.064	0.793
21.00	1.15	1.00	1.15	0.55	31.14	44.21	100.00	0.000	0.0E0	0.048	0.841
20.00	1.14	1.00	1.14	1.33	2.92	41.32	100.00	0.000	0.0E0	0.000	0.841
19.00	1.12	1.00	1.12	0.48	17.45	35.38	100.00	0.000	0.0E0	0.000	0.841
18.00	1.10	1.00	1.10	0.51	26.63	40.18	100.00	0.000	0.0E0	0.024	0.865
17.00	1.08	1.00	1.08	1.30	2.93	40.22	100.00	0.000	0.0E0	0.000	0.865
16.00	1.06	1.00	1.06	0.40	26.71	35.82	100.00	0.000	0.0E0	0.022	0.887
15.00	1.03	1.00	1.03	5.00	NoLiq	6.39	41.00	0.000	0.0E0	0.000	0.887
14.00	1.00	1.00	1.00	0.34	22.56	31.17	92.76	0.958	5.7E-3	0.116	1.003
13.00	0.97	1.00	0.97	0.31	24.57	30.00	90.07	1.314	7.9E-3	0.179	1.183
12.00	0.94	1.00	0.94	5.00	NoLiq	8.08	45.71	0.000	0.0E0	0.107	1.289
11.00	0.90	1.00	0.90	5.00	NoLiq	4.84	36.24	0.000	0.0E0	0.000	1.289
10.00	0.86	1.00	0.86	0.63	13.09	33.61	98.85	0.122	7.3E-4	0.007	1.296

Settlement of Saturated Sands=1.296 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth ft	sigma' atm	sigC' atm	(N1)60s	CSRsf	Gmax atm	g*Ge/Gm	g_eff	ec7.5 %	Cec	ec %	dsz in.	dsp in.	S in.
6.00	0.35	0.23	33.69	0.87	691.74	4.5E-4	1.0000	0.4691	0.95	0.4461	5.35E-3	0.081	0.079

Unsaturated Sands from 0-5 feet and 6-10 feet are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0.079in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.375 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs

MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

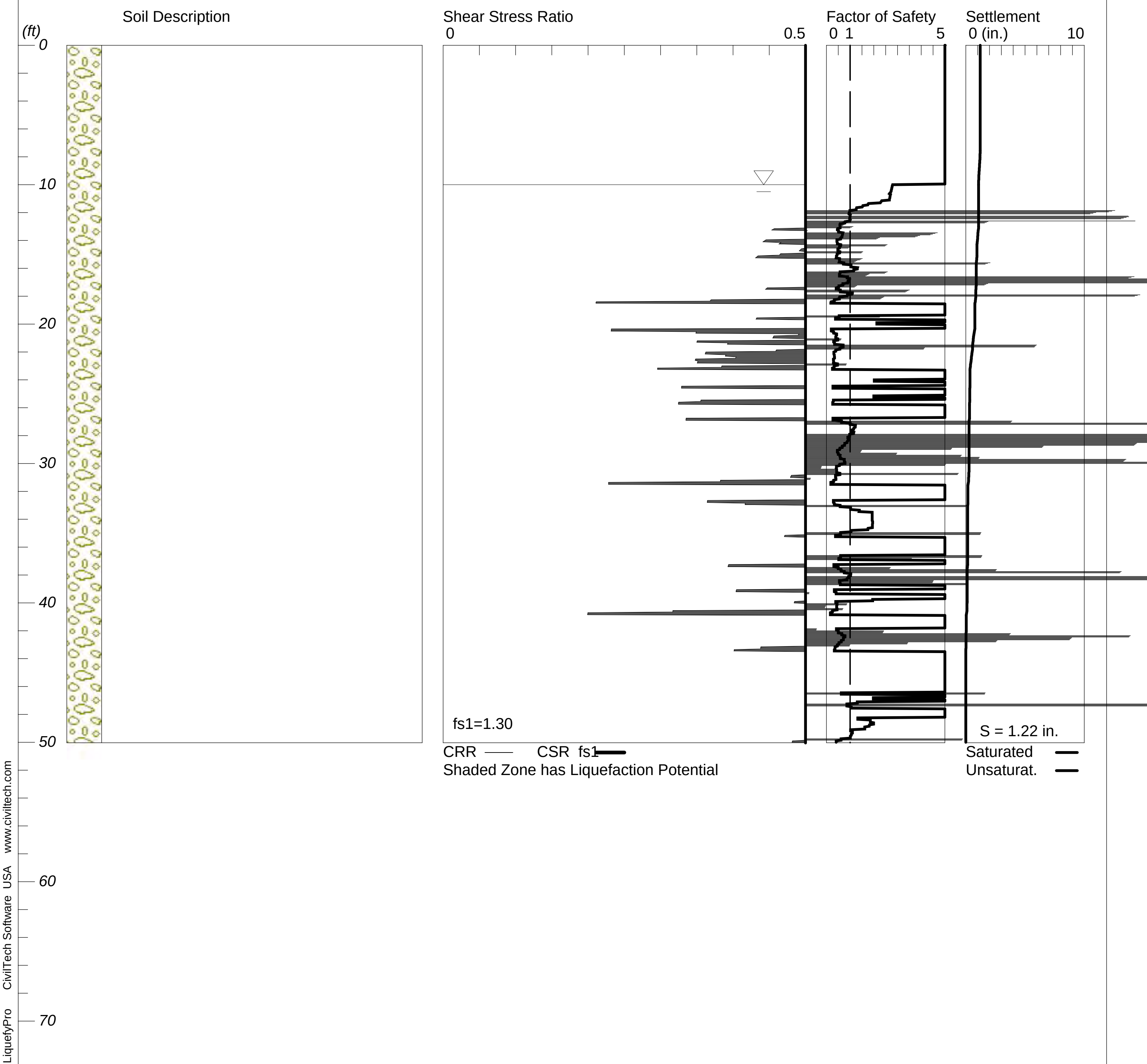
1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
   SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS
San Juan School

Hole No.=CPT-4   Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



Moore Twining Associates, Inc. **E83701.03** **Plate A-1**

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LIQUEFACTION ANALYSIS CALCULATION DETAILS
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Font: Courier New, Regular, Size 8 is recommended for this report.
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Input File Name: UNTITLED
Title: San Juan School
Subtitle: E83701.03

Input Data:

Surface Elev.=
Hole No.=CPT-4
Depth of Hole=50.03 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 20.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	547.22	0.62	0.11	130.00	0.00	0.50
0.98	65.24	3.07	4.70	120.00	0.00	0.50
1.97	34.69	1.99	5.74	115.00	0.00	0.50
2.95	21.77	1.55	7.12	115.00	0.00	0.50
3.94	40.42	1.41	3.49	115.00	0.00	0.50
4.92	42.36	1.84	4.35	115.00	0.00	0.50
5.91	99.82	1.31	1.31	125.00	0.00	0.50
6.89	112.96	1.70	1.51	125.00	0.00	0.50
7.87	103.30	2.04	1.98	120.00	0.00	0.50
8.86	288.23	2.14	0.74	125.00	0.00	0.50
9.84	332.01	2.49	0.75	125.00	0.00	0.50
10.83	235.59	2.05	0.87	125.00	0.00	0.50
11.81	148.14	1.85	1.25	125.00	0.00	0.50
12.80	87.70	2.09	2.38	120.00	0.00	0.50
13.78	137.97	1.37	0.99	125.00	0.00	0.50
14.76	53.32	2.24	4.19	115.00	0.00	0.50
15.75	194.30	1.96	1.01	125.00	0.00	0.50
16.73	203.44	1.65	0.81	125.00	0.00	0.50
17.72	220.09	1.84	0.84	125.00	0.00	0.50
18.70	14.07	0.34	2.39	115.00	0.00	0.50
19.69	41.23	2.80	6.78	115.00	0.00	0.50
20.67	155.71	1.36	0.87	125.00	0.00	0.50
21.65	186.73	1.52	0.81	125.00	0.00	0.50
22.64	117.55	1.53	1.30	120.00	0.00	0.50
23.62	25.71	1.57	6.10	115.00	0.00	0.50
24.61	41.95	1.71	4.07	115.00	0.00	0.50
25.59	55.49	1.71	3.08	115.00	0.00	0.50
26.57	39.42	1.68	4.26	115.00	0.00	0.50
27.56	259.99	1.72	0.66	125.00	0.00	0.50
28.54	235.46	1.60	0.68	125.00	0.00	0.50
29.53	215.39	1.70	0.79	125.00	0.00	0.50
30.51	154.21	2.39	1.55	125.00	0.00	0.50
31.50	25.63	0.81	3.16	115.00	0.00	0.50
32.48	31.49	1.90	6.05	115.00	0.00	0.50
33.46	339.09	4.32	1.27	125.00	0.00	0.50
34.45	390.94	5.02	1.28	125.00	0.00	0.50
35.43	38.63	1.31	3.40	115.00	0.00	0.50
36.42	75.69	3.39	4.48	115.00	0.00	0.50
37.40	206.83	1.78	0.86	125.00	0.00	0.50
38.39	159.65	3.44	2.15	120.00	0.00	0.50
39.37	59.90	2.96	4.93	115.00	0.00	0.50
40.35	132.39	3.18	2.40	120.00	0.00	0.50
41.34	24.77	1.52	6.14	115.00	0.00	0.50
42.32	266.24	2.02	0.76	125.00	0.00	0.50
43.31	73.16	2.45	3.35	115.00	0.00	0.50
44.29	72.30	4.44	6.14	115.00	0.00	0.50
45.28	37.78	1.68	4.46	115.00	0.00	0.50
46.26	49.64	3.60	7.25	115.00	0.00	0.50
47.24	181.92	5.16	2.84	120.00	0.00	0.50
48.23	134.01	6.85	5.11	120.00	0.00	0.50
49.21	266.77	4.65	1.74	125.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	130.00	0.000	130.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	120.00	0.060	120.00	0.060	1.00	0.000	1.046	0.68	1.30	0.88
2.00	115.00	0.116	115.00	0.116	1.00	0.000	1.046	0.68	1.30	0.88
3.00	115.00	0.171	115.00	0.171	0.99	0.000	1.046	0.68	1.30	0.88
4.00	115.00	0.225	115.00	0.225	0.99	0.000	1.046	0.67	1.30	0.88
5.00	115.00	0.280	115.00	0.280	0.99	0.000	1.046	0.67	1.30	0.87
6.00	125.00	0.336	125.00	0.336	0.99	0.000	1.046	0.67	1.30	0.87
7.00	125.00	0.394	125.00	0.394	0.98	0.000	1.046	0.67	1.30	0.87
8.00	120.00	0.453	120.00	0.453	0.98	0.000	1.046	0.67	1.30	0.87
9.00	125.00	0.512	125.00	0.512	0.98	0.000	1.046	0.67	1.30	0.87
10.00	125.00	0.571	62.60	0.571	0.98	0.000	1.046	0.66	1.30	0.86
11.00	125.00	0.630	62.60	0.600	0.97	0.000	1.046	0.70	1.30	0.90
12.00	125.00	0.689	62.60	0.630	0.97	0.000	1.046	0.72	1.30	0.94
13.00	125.00	0.746	62.60	0.658	0.97	0.000	1.046	0.75	1.30	0.97
14.00	125.00	0.805	62.60	0.687	0.97	0.000	1.046	0.77	1.30	1.00
15.00	120.00	0.862	57.60	0.714	0.97	0.000	1.046	0.79	1.30	1.03
16.00	125.00	0.920	62.60	0.743	0.96	0.000	1.046	0.81	1.30	1.05
17.00	125.00	0.979	62.60	0.773	0.96	0.000	1.046	0.83	1.30	1.08
18.00	125.00	1.038	62.60	0.802	0.96	0.000	1.046	0.84	1.30	1.10
19.00	115.00	1.094	52.60	0.829	0.96	0.000	1.046	0.86	1.30	1.12
20.00	120.00	1.149	57.60	0.854	0.95	0.000	1.046	0.87	1.30	1.13
21.00	125.00	1.206	62.60	0.882	0.95	0.000	1.046	0.88	1.30	1.15
22.00	125.00	1.265	62.60	0.912	0.95	0.000	1.046	0.90	1.30	1.16
23.00	120.00	1.323	57.60	0.939	0.95	0.000	1.046	0.91	1.30	1.18
24.00	115.00	1.378	52.60	0.965	0.94	0.000	1.046	0.92	1.30	1.19
25.00	115.00	1.432	52.60	0.990	0.94	0.000	1.046	0.93	1.30	1.20
26.00	115.00	1.487	52.60	1.015	0.94	0.000	1.046	0.94	1.30	1.22
27.00	125.00	1.542	62.60	1.040	0.94	0.000	1.046	0.94	1.30	1.23
28.00	125.00	1.601	62.60	1.070	0.93	0.000	1.046	0.95	1.30	1.24
29.00	125.00	1.660	62.60	1.100	0.93	0.000	1.046	0.96	1.30	1.24
30.00	125.00	1.719	62.60	1.129	0.93	0.000	1.046	0.96	1.30	1.25
31.00	125.00	1.777	62.60	1.158	0.92	0.000	1.046	0.96	1.30	1.25
32.00	115.00	1.832	52.60	1.184	0.91	0.000	1.046	0.96	1.30	1.25
33.00	125.00	1.887	62.60	1.209	0.91	0.000	1.046	0.96	1.30	1.25
34.00	125.00	1.946	62.60	1.239	0.90	0.000	1.046	0.96	1.30	1.25
35.00	120.00	2.005	57.60	1.268	0.89	0.000	1.046	0.96	1.30	1.24
36.00	115.00	2.060	52.60	1.293	0.88	0.000	1.046	0.95	1.30	1.24
37.00	115.00	2.115	52.60	1.319	0.87	0.000	1.046	0.95	1.30	1.24
38.00	125.00	2.173	62.60	1.347	0.86	0.000	1.046	0.95	1.30	1.23
39.00	115.00	2.229	52.60	1.374	0.86	0.000	1.046	0.94	1.30	1.23
40.00	120.00	2.284	57.60	1.400	0.85	0.000	1.046	0.94	1.30	1.22
41.00	115.00	2.341	52.60	1.427	0.84	0.000	1.046	0.94	1.30	1.22
42.00	125.00	2.396	62.60	1.452	0.83	0.000	1.046	0.93	1.30	1.21
43.00	125.00	2.455	62.60	1.482	0.82	0.000	1.046	0.93	1.30	1.21
44.00	115.00	2.510	52.60	1.508	0.82	0.000	1.046	0.92	1.30	1.20
45.00	115.00	2.565	52.60	1.533	0.81	0.000	1.046	0.92	1.30	1.19
46.00	115.00	2.619	52.60	1.557	0.80	0.000	1.046	0.91	1.30	1.19
47.00	115.00	2.673	52.60	1.582	0.79	0.000	1.046	0.91	1.30	1.18
48.00	115.00	2.728	52.60	1.608	0.78	0.000	1.046	0.90	1.30	1.17
49.00	120.00	2.785	57.60	1.635	0.78	0.000	1.046	0.90	1.30	1.17
50.00	120.00	2.843	57.60	1.663	0.77	0.000	1.046	0.89	1.30	1.16

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	5.47E7	0.11	4.28						
0.00	547.22	0.62	1.00	5.47E7	0.11	4.28	1.00	NoLiq	1.00	500.00	500.00	2.08
1.00			1.00	1.09E3	4.70	1.94						
1.00			0.50	2.67E2	4.70	2.16						
1.00	65.24	3.07	0.50	2.67E2	4.70	2.16	4.09	17.73	0.34	266.55	403.79	2.08
2.00			1.00	2.98E2	5.76	2.22						
2.00			0.50	1.02E2	5.76	2.46						
2.00	34.69	1.99	0.50	1.02E2	5.76	2.46	2.94	29.00	0.64	101.90	283.66	2.08
3.00			1.00	1.26E2	7.17	2.49						
3.00			0.50	5.27E1	7.17	2.71						
3.00			0.70	7.50E1	7.17	2.62						
3.00	21.77	1.55	0.70	7.50E1	7.17	2.62	3.44	36.23	0.80	74.96	374.81	2.08
4.00			1.00	1.78E2	3.51	2.15						
4.00			0.50	8.52E1	3.51	2.34						
4.00	40.42	1.41	0.50	8.52E1	3.51	2.34	2.11	24.14	0.51	85.16	174.15	0.57
5.00			1.00	1.50E2	4.38	2.27						
5.00			0.50	8.01E1	4.38	2.43						
5.00	42.36	1.84	0.50	8.01E1	4.38	2.43	1.89	27.78	0.61	80.10	204.45	0.87
6.00			1.00	2.96E2	1.31	1.67						
6.00			0.50	1.72E2	1.31	1.82						
6.00	99.82	1.31	0.50	1.72E2	1.31	1.82	1.72	8.56	0.10	172.12	190.21	0.72

7.00			1.00	2.86E2	1.51	1.73						
7.00			0.50	1.80E2	1.51	1.85						
7.00	112.96	1.70	0.50	1.80E2	1.51	1.85	1.59	9.29	0.11	179.99	203.28	0.86
8.00			1.00	2.27E2	1.98	1.88						
8.00			0.50	1.54E2	1.98	1.99						
8.00	103.30	2.04	0.50	1.54E2	1.98	1.99	1.49	12.62	0.20	153.53	192.74	0.75
9.00			1.00	5.62E2	0.74	1.31						
9.00			0.50	4.03E2	0.74	1.39						
9.00	288.23	2.14	0.50	4.03E2	0.74	1.39	1.40	1.42	0.00	402.95	402.95	2.08
10.00			1.00	5.81E2	0.75	1.30						
10.00			0.50	4.39E2	0.75	1.37						
10.00	332.01	2.49	0.50	4.39E2	0.75	1.37	1.32	1.20	0.00	439.48	439.48	2.08
11.00			1.00	3.62E2	0.86	1.47						
11.00			0.50	2.88E2	0.86	1.53						
11.00	228.35	1.96	0.50	2.88E2	0.86	1.53	1.26	3.34	0.00	287.74	287.74	2.08
12.00			1.00	2.06E2	1.42	1.79						
12.00			0.50	1.72E2	1.42	1.85						
12.00	142.35	2.01	0.50	1.72E2	1.42	1.85	1.20	9.13	0.11	171.51	192.74	0.75
13.00			1.00	1.55E2	1.45	1.88						
13.00			0.50	1.35E2	1.45	1.92						
13.00	116.75	1.68	0.50	1.35E2	1.45	1.92	1.16	10.97	0.16	135.15	160.77	0.47
14.00			1.00	1.33E2	1.38	1.91						
14.00			0.50	1.20E2	1.38	1.94						
14.00	107.85	1.48	0.50	1.20E2	1.38	1.94	1.11	11.51	0.17	120.18	145.44	0.37
15.00			1.00	7.89E1	2.95	2.31						
15.00			0.50	7.41E1	2.95	2.33						
15.00	68.82	2.01	0.50	7.41E1	2.95	2.33	1.08	23.54	0.50	74.14	146.84	0.37
16.00			1.00	2.37E2	0.98	1.63						
16.00			0.50	2.28E2	0.98	1.64						
16.00	219.14	2.13	0.50	2.28E2	0.98	1.64	1.04	5.08	0.00	228.48	228.98	1.20
17.00			1.00	2.03E2	0.78	1.61						
17.00			0.50	2.02E2	0.78	1.61						
17.00	199.51	1.56	0.50	2.02E2	0.78	1.61	1.01	4.56	0.00	201.64	201.64	0.84
18.00			1.00	1.95E2	0.54	1.52						
18.00			0.50	2.00E2	0.54	1.51						
18.00	203.72	1.10	0.50	2.00E2	0.54	1.51	0.98	2.97	0.00	199.98	199.98	0.82
19.00			1.00	1.11E1	4.84	3.08						
19.00	13.29	0.59	1.00	1.11E1	4.84	3.08	1.00	NoLiq	1.00	13.29	13.29	2.08
20.00			1.00	1.04E2	2.12	2.12						
20.00			0.50	1.12E2	2.12	2.10						
20.00	120.42	2.52	0.50	1.12E2	2.12	2.10	0.93	15.76	0.29	112.33	157.63	0.44
21.00			1.00	1.25E2	0.92	1.81						
21.00			0.50	1.37E2	0.92	1.78						
21.00	148.47	1.36	0.50	1.37E2	0.92	1.78	0.92	7.79	0.07	136.78	147.80	0.38
22.00			1.00	9.59E1	1.37	2.01						
22.00			0.50	1.07E2	1.37	1.98						
22.00	117.08	1.59	0.50	1.07E2	1.37	1.98	0.91	12.43	0.20	106.53	132.88	0.30
23.00			1.00	8.89E1	1.70	2.10						
23.00			0.50	1.00E2	1.70	2.06						
23.00	111.20	1.86	0.50	1.00E2	1.70	2.06	0.90	14.76	0.26	100.04	135.29	0.31
24.00			1.00	4.21E1	3.81	2.58						
24.00			0.50	4.85E1	3.81	2.53						
24.00	54.52	2.02	0.50	4.85E1	3.81	2.53	0.89	32.25	0.73	48.55	178.28	0.61
25.00			1.00	3.36E1	5.30	2.75						
25.00	44.62	2.29	1.00	3.36E1	5.30	2.75	1.00	NoLiq	1.00	44.62	44.62	2.08
26.00			1.00	2.77E1	3.60	2.70						
26.00	37.83	1.31	1.00	2.77E1	3.60	2.70	1.00	NoLiq	1.00	37.83	37.83	2.08
27.00			1.00	1.56E2	0.87	1.72						
27.00			0.50	1.82E2	0.87	1.67						
27.00	210.51	1.81	0.50	1.82E2	0.87	1.67	0.86	5.65	0.02	182.07	185.30	0.67
28.00			1.00	1.85E2	0.76	1.63						
28.00			0.50	2.18E2	0.76	1.58						
28.00	254.86	1.92	0.50	2.18E2	0.76	1.58	0.86	4.00	0.00	218.03	218.03	1.04
29.00			1.00	1.38E2	1.04	1.82						
29.00			0.50	1.65E2	1.04	1.76						
29.00	194.95	2.01	0.50	1.65E2	1.04	1.76	0.85	7.31	0.06	165.00	175.84	0.59
30.00			1.00	1.56E2	1.17	1.82						
30.00			0.50	1.87E2	1.17	1.76						
30.00	223.60	2.60	0.50	1.87E2	1.17	1.76	0.84	7.28	0.06	187.28	199.44	0.82
31.00			1.00	1.06E2	1.27	1.96						
31.00			0.50	1.29E2	1.27	1.90						
31.00	155.53	1.96	0.50	1.29E2	1.27	1.90	0.83	10.35	0.14	128.97	150.46	0.40
32.00			1.00	1.41E1	3.01	2.88						
32.00	22.65	0.63	1.00	1.41E1	3.01	2.88	1.00	NoLiq	1.00	22.65	22.65	2.08
33.00			1.00	1.36E2	1.03	1.82						
33.00			0.50	1.68E2	1.03	1.75						
33.00	206.10	2.10	0.50	1.68E2	1.03	1.75	0.82	7.11	0.06	167.99	178.03	0.60
34.00			1.00	3.24E2	0.87	1.51						
34.00			0.50	4.03E2	0.87	1.45						
34.00	499.21	4.33	0.50	4.03E2	0.87	1.45	0.81	2.12	0.00	402.95	402.95	2.08
35.00			1.00	7.38E1	3.31	2.37						
35.00			0.50	9.39E1	3.31	2.30						
35.00	117.44	3.82	0.50	9.39E1	3.31	2.30	0.80	22.36	0.46	93.91	175.07	0.58
36.00			1.00	1.90E1	3.91	2.84						
36.00	32.24	1.18	1.00	1.90E1	3.91	2.84	1.00	NoLiq	1.00	32.24	32.24	2.08
37.00			1.00	3.76E1	5.34	2.72						
37.00	62.76	3.24	1.00	3.76E1	5.34	2.72	1.00	NoLiq	1.00	62.76	62.76	2.08
38.00			1.00	1.72E2	0.68	1.62						
38.00			0.50	2.22E2	0.68	1.54						
38.00	284.34	1.92	0.50	2.22E2	0.68	1.54	0.78	3.41	0.00	221.81	221.81	1.09

39.00			1.00	4.56E1	5.54	2.67						
39.00	78.45	4.22	1.00	4.56E1	5.54	2.67	1.00	NoLiq	1.00	78.45	78.45	2.08
40.00			1.00	8.59E1	1.79	2.13						
40.00			0.50	1.14E2	1.79	2.04						
40.00	147.92	2.61	0.50	1.14E2	1.79	2.04	0.77	14.12	0.24	113.59	150.14	0.39
41.00			1.00	1.73E1	2.29	2.73						
41.00	32.13	0.68	1.00	1.73E1	2.29	2.73	1.00	NoLiq	1.00	32.13	32.13	2.08
42.00			1.00	1.13E2	1.17	1.92						
42.00			0.50	1.51E2	1.17	1.82						
42.00	199.40	2.30	0.50	1.51E2	1.17	1.82	0.76	8.63	0.10	150.80	166.98	0.51
43.00			1.00	1.00E2	1.45	2.02						
43.00			0.50	1.36E2	1.45	1.92						
43.00	181.11	2.59	0.50	1.36E2	1.45	1.92	0.75	10.94	0.16	135.82	161.44	0.47
44.00			1.00	1.99E1	9.76	3.10						
44.00	38.35	3.50	1.00	1.99E1	9.76	3.10	1.00	NoLiq	1.00	38.35	38.35	2.08
45.00			1.00	2.31E1	4.01	2.79						
45.00	44.88	1.70	1.00	2.31E1	4.01	2.79	1.00	NoLiq	1.00	44.88	44.88	2.08
46.00			1.00	2.11E1	5.98	2.93						
46.00	41.80	2.34	1.00	2.11E1	5.98	2.93	1.00	NoLiq	1.00	41.80	41.80	2.08
47.00			1.00	5.20E1	6.33	2.68						
47.00	100.45	6.19	1.00	5.20E1	6.33	2.68	1.00	NoLiq	1.00	100.45	100.45	2.08
48.00			1.00	4.11E1	7.98	2.82						
48.00	80.98	6.24	1.00	4.11E1	7.98	2.82	1.00	NoLiq	1.00	80.98	80.98	2.08
49.00			1.00	9.69E1	4.28	2.37						
49.00			0.50	1.37E2	4.28	2.28						
49.00	189.85	8.00	0.50	1.37E2	4.28	2.28	0.72	21.86	0.45	136.62	248.43	1.51
50.00			1.00	8.22E1	1.73	2.13						
50.00			0.50	1.17E2	1.73	2.02						
50.00	163.84	2.78	0.50	1.17E2	1.73	2.02	0.71	13.56	0.23	117.04	151.73	0.40

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 20.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.00	0.88	5.00 ^
1.00	0.04	2.08	1.00	2.08	1.16	2.41	0.88	5.00
2.00	0.08	2.08	1.00	2.08	1.16	2.41	0.88	5.00
3.00	0.11	2.08	1.00	2.08	1.16	2.41	0.88	5.00
4.00	0.15	0.57	1.00	0.57	1.16	0.66	0.88	5.00
5.00	0.18	0.87	1.00	0.87	1.16	1.01	0.87	5.00
6.00	0.22	0.72	1.00	0.72	1.16	0.83	0.87	5.00
7.00	0.26	0.86	1.00	0.86	1.16	1.00	0.87	5.00
8.00	0.29	0.75	1.00	0.75	1.16	0.86	0.87	5.00
9.00	0.33	2.08	1.00	2.08	1.16	2.41	0.87	5.00
10.00	0.37	2.08	1.00	2.08	1.16	2.41	0.86	2.79
11.00	0.41	2.08	1.00	2.08	1.16	2.41	0.90	2.67
12.00	0.45	0.75	1.00	0.75	1.16	0.86	0.94	0.92 *
13.00	0.49	0.47	1.00	0.47	1.16	0.54	0.97	0.56 *
14.00	0.52	0.37	1.00	0.37	1.16	0.42	1.00	0.42 *
15.00	0.56	0.37	1.00	0.37	1.16	0.43	1.03	0.42 *
16.00	0.60	1.20	1.00	1.20	1.16	1.39	1.05	1.32
17.00	0.64	0.84	1.00	0.84	1.16	0.98	1.08	0.91 *
18.00	0.67	0.82	1.00	0.82	1.16	0.95	1.10	0.87 *
19.00	0.71	2.08	1.00	2.08	1.16	2.00	1.12	5.00 ^
20.00	0.75	0.44	1.00	0.44	1.16	0.51	1.13	0.45 *
21.00	0.77	0.38	1.00	0.38	1.16	0.44	1.15	0.38 *
22.00	0.79	0.30	1.00	0.30	1.16	0.35	1.16	0.30 *
23.00	0.80	0.31	1.00	0.31	1.16	0.36	1.18	0.31 *
24.00	0.82	0.61	1.00	0.61	1.16	0.70	1.19	0.59 *
25.00	0.84	2.08	1.00	2.08	1.16	2.00	1.20	5.00 ^
26.00	0.85	2.08	1.00	2.08	1.16	2.00	1.22	5.00 ^
27.00	0.87	0.67	1.00	0.67	1.16	0.78	1.23	0.63 *
28.00	0.89	1.04	1.00	1.04	1.16	1.21	1.24	0.98 *
29.00	0.91	0.59	1.00	0.59	1.16	0.68	1.24	0.55 *
30.00	0.93	0.82	1.00	0.82	1.16	0.95	1.25	0.76 *
31.00	0.95	0.40	1.00	0.40	1.16	0.46	1.25	0.37 *
32.00	0.96	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
33.00	0.98	0.60	1.00	0.60	1.16	0.70	1.25	0.56 *
34.00	1.00	2.08	1.00	2.08	1.16	2.41	1.25	1.93
35.00	1.02	0.58	1.00	0.58	1.16	0.67	1.24	0.54 *
36.00	1.03	2.08	1.00	2.08	1.16	2.00	1.24	5.00 ^
37.00	1.05	2.08	1.00	2.08	1.16	2.00	1.24	5.00 ^
38.00	1.07	1.09	1.00	1.09	1.16	1.26	1.23	1.02
39.00	1.09	2.08	0.99	2.06	1.16	2.00	1.23	5.00 ^
40.00	1.10	0.39	0.99	0.39	1.16	0.45	1.22	0.37 *
41.00	1.12	2.08	0.99	2.05	1.16	2.00	1.22	5.00 ^
42.00	1.14	0.51	0.98	0.51	1.16	0.59	1.21	0.48 *
43.00	1.16	0.47	0.98	0.46	1.16	0.54	1.21	0.44 *
44.00	1.17	2.08	0.98	2.04	1.16	2.00	1.20	5.00 ^
45.00	1.19	2.08	0.98	2.03	1.16	2.00	1.19	5.00 ^
46.00	1.20	2.08	0.97	2.03	1.16	2.00	1.19	5.00 ^
47.00	1.22	2.08	0.97	2.02	1.16	2.00	1.18	5.00 ^
48.00	1.24	2.08	0.97	2.02	1.16	2.00	1.17	5.00 ^
49.00	1.26	1.51	0.97	1.46	1.16	1.69	1.17	1.45
50.00	1.27	0.40	0.96	0.39	1.16	0.45	1.16	0.39 *

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	4.28	1.02	500.00	100.00	NoLiq	0.00	100.00
1.00	2.16	4.51	403.79	89.61	17.73	0.00	89.61
2.00	2.46	3.95	283.66	71.79	29.00	0.00	71.79
3.00	2.62	3.66	374.81	100.00	36.23	0.00	100.00
4.00	2.34	4.17	174.15	41.75	24.14	0.00	41.75
5.00	2.43	4.00	204.45	51.06	27.78	0.00	51.06
6.00	1.82	5.14	190.21	37.03	8.56	0.00	37.03
7.00	1.85	5.08	203.28	40.05	9.29	0.00	40.05
8.00	1.99	4.83	192.74	39.93	12.62	0.00	39.93
9.00	1.39	5.93	402.95	67.97	1.42	0.00	67.97
10.00	1.37	5.96	439.48	73.70	1.20	0.00	73.70
11.00	1.53	5.66	287.74	50.80	3.34	0.00	50.80
12.00	1.85	5.09	192.74	37.87	9.13	0.00	37.87
13.00	1.92	4.95	160.77	32.51	10.97	0.00	32.51
14.00	1.94	4.91	145.44	29.65	11.51	0.00	29.65
15.00	2.33	4.20	146.84	34.96	23.54	0.00	34.96
16.00	1.64	5.46	228.98	41.90	5.08	0.00	41.90
17.00	1.61	5.52	201.64	36.52	4.56	0.00	36.52
18.00	1.51	5.71	199.98	35.02	2.97	0.00	35.02
19.00	3.08	2.80	13.29	4.74	NoLiq	0.00	4.74
20.00	2.10	4.62	157.63	34.10	15.76	0.00	34.10
21.00	1.78	5.20	147.80	28.41	7.79	0.00	28.41
22.00	1.98	4.84	132.88	27.45	12.43	0.00	27.45
23.00	2.06	4.69	135.29	28.88	14.76	0.00	28.88
24.00	2.53	3.82	178.28	46.71	32.25	0.00	46.71
25.00	2.75	3.42	44.62	13.05	NoLiq	0.00	13.05
26.00	2.70	3.52	37.83	10.75	NoLiq	0.00	10.75
27.00	1.67	5.41	185.30	34.28	5.65	0.00	34.28
28.00	1.58	5.58	218.03	39.04	4.00	0.00	39.04
29.00	1.76	5.25	175.84	33.52	7.31	0.00	33.52
30.00	1.76	5.25	199.44	38.00	7.28	0.00	38.00
31.00	1.90	4.99	150.46	30.14	10.35	0.00	30.14
32.00	2.88	3.18	22.65	7.11	NoLiq	0.00	7.11
33.00	1.75	5.26	178.03	33.82	7.11	0.00	33.82
34.00	1.45	5.83	402.95	69.16	2.12	0.00	69.16
35.00	2.30	4.26	175.07	41.12	22.36	0.00	41.12
36.00	2.84	3.25	32.24	9.93	NoLiq	0.00	9.93
37.00	2.72	3.48	62.76	18.04	NoLiq	0.00	18.04
38.00	1.54	5.66	221.81	39.22	3.41	0.00	39.22
39.00	2.67	3.56	78.45	22.01	NoLiq	0.00	22.01
40.00	2.04	4.73	150.14	31.77	14.12	0.00	31.77
41.00	2.73	3.45	32.13	9.32	NoLiq	0.00	9.32
42.00	1.82	5.13	166.98	32.55	8.63	0.00	32.55
43.00	1.92	4.95	161.44	32.63	10.94	0.00	32.63
44.00	3.10	2.77	38.35	13.82	NoLiq	0.00	13.82
45.00	2.79	3.35	44.88	13.39	NoLiq	0.00	13.39
46.00	2.93	3.08	41.80	13.55	NoLiq	0.00	13.55
47.00	2.68	3.55	100.45	28.26	NoLiq	0.00	28.26
48.00	2.82	3.29	80.98	24.61	NoLiq	0.00	24.61
49.00	2.28	4.28	248.43	58.00	21.86	0.00	58.00
50.00	2.02	4.76	151.73	31.86	13.56	0.00	31.86

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.00	1.16	1.00	1.16	0.39	13.56	31.86	94.41	0.740	4.4E-3	0.004	0.004
49.00	1.17	1.00	1.17	1.45	21.86	58.00	100.00	0.000	0.0E0	0.009	0.013
48.00	1.17	1.00	1.17	5.00	NoLiq	24.61	78.97	0.000	0.0E0	0.000	0.013
47.00	1.18	1.00	1.18	5.00	NoLiq	28.26	86.25	0.000	0.0E0	0.000	0.013
46.00	1.19	1.00	1.19	5.00	NoLiq	13.55	58.38	0.000	0.0E0	0.000	0.013
45.00	1.19	1.00	1.19	5.00	NoLiq	13.39	58.04	0.000	0.0E0	0.000	0.013
44.00	1.20	1.00	1.20	5.00	NoLiq	13.82	58.93	0.000	0.0E0	0.000	0.013
43.00	1.21	1.00	1.21	0.44	10.94	32.63	96.33	0.481	2.9E-3	0.025	0.038
42.00	1.21	1.00	1.21	0.48	8.63	32.55	96.12	0.505	3.0E-3	0.024	0.062
41.00	1.22	1.00	1.22	5.00	NoLiq	9.32	48.88	0.000	0.0E0	0.000	0.062
40.00	1.22	1.00	1.22	0.37	14.12	31.77	94.19	0.768	4.6E-3	0.087	0.149
39.00	1.23	1.00	1.23	5.00	NoLiq	22.01	74.16	0.000	0.0E0	0.009	0.158
38.00	1.23	1.00	1.23	1.02	3.41	39.22	100.00	0.000	0.0E0	0.000	0.158
37.00	1.24	1.00	1.24	5.00	NoLiq	18.04	66.99	0.000	0.0E0	0.052	0.210
36.00	1.24	1.00	1.24	5.00	NoLiq	9.93	50.38	0.000	0.0E0	0.000	0.210
35.00	1.24	1.00	1.24	0.54	22.36	41.12	100.00	0.000	0.0E0	0.000	0.210
34.00	1.25	1.00	1.25	1.93	2.12	69.16	100.00	0.000	0.0E0	0.000	0.210
33.00	1.25	1.00	1.25	0.56	7.11	33.82	99.41	0.070	4.2E-4	0.001	0.211
32.00	1.25	1.00	1.25	5.00	NoLiq	7.11	43.06	0.000	0.0E0	0.024	0.236
31.00	1.25	1.00	1.25	0.37	10.35	30.14	90.37	1.274	7.6E-3	0.064	0.299
30.00	1.25	1.00	1.25	0.76	7.28	38.00	100.00	0.000	0.0E0	0.033	0.332
29.00	1.24	1.00	1.24	0.55	7.31	33.52	98.62	0.168	1.0E-3	0.024	0.356
28.00	1.24	1.00	1.24	0.98	4.00	39.04	100.00	0.000	0.0E0	0.002	0.358
27.00	1.23	1.00	1.23	0.63	5.65	34.28	100.00	0.000	0.0E0	0.000	0.358
26.00	1.22	1.00	1.22	5.00	NoLiq	10.75	52.30	0.000	0.0E0	0.035	0.394
25.00	1.20	1.00	1.20	5.00	NoLiq	13.05	57.34	0.000	0.0E0	0.022	0.416
24.00	1.19	1.00	1.19	0.59	32.25	46.71	100.00	0.000	0.0E0	0.000	0.416
23.00	1.18	1.00	1.18	0.31	14.76	28.88	87.57	1.426	8.6E-3	0.045	0.461

22.00	1.16	1.00	1.16	0.30	12.43	27.45	84.57	1.553	9.3E-3	0.161	0.622
21.00	1.15	1.00	1.15	0.38	7.79	28.41	86.57	1.468	8.8E-3	0.109	0.731
20.00	1.13	1.00	1.13	0.45	15.76	34.10	100.00	0.000	0.0E0	0.128	0.859
19.00	1.12	1.00	1.12	5.00	NoLiq	4.74	35.92	0.000	0.0E0	0.000	0.859
18.00	1.10	1.00	1.10	0.87	2.97	35.02	100.00	0.000	0.0E0	0.083	0.942
17.00	1.08	1.00	1.08	0.91	4.56	36.52	100.00	0.000	0.0E0	0.043	0.985
16.00	1.05	1.00	1.05	1.32	5.08	41.90	100.00	0.000	0.0E0	0.016	1.001
15.00	1.03	1.00	1.03	0.42	23.54	34.96	100.00	0.000	0.0E0	0.070	1.072
14.00	1.00	1.00	1.00	0.42	11.51	29.65	89.26	1.348	8.1E-3	0.042	1.114
13.00	0.97	1.00	0.97	0.56	10.97	32.51	96.03	0.474	2.8E-3	0.106	1.219
12.00	0.94	1.00	0.94	0.92	9.13	37.87	100.00	0.000	0.0E0	0.000	1.219
11.00	0.90	1.00	0.90	2.67	3.34	50.80	100.00	0.000	0.0E0	0.000	1.219
10.00	0.86	1.00	0.86	2.79	1.20	73.70	100.00	0.000	0.0E0	0.000	1.219

Settlement of Saturated Sands=1.219 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

Unsaturated Sands from 0-10 feet are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0.0 in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.219 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5

Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
   SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

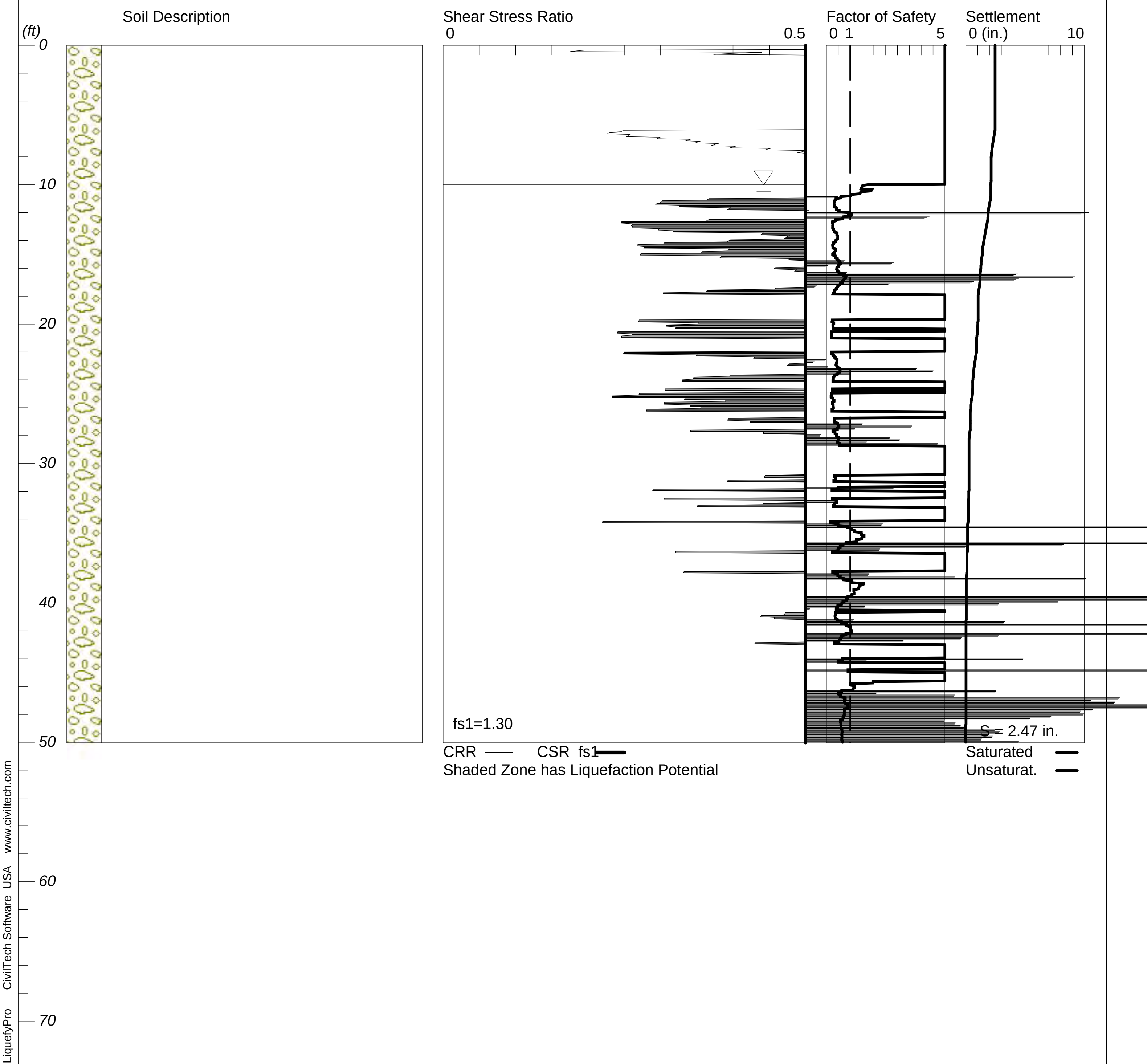
Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=CPT-5 Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



Moore Twining Associates, Inc. **E83701.03** **Plate A-1**

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LIQUEFACTION ANALYSIS CALCULATION DETAILS
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Font: Courier New, Regular, Size 8 is recommended for this report.
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Input File Name: UNTITLED
Title: San Juan School
Subtitle: E83701.03

Input Data:

Surface Elev.=
Hole No.=CPT-5
Depth of Hole=50.03 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 23.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	24.66	0.22	0.90	115.00	0.00	0.50
0.98	142.05	0.78	0.55	125.00	0.00	0.50
1.97	158.04	1.03	0.65	125.00	0.00	0.50
2.95	127.16	1.15	0.90	125.00	0.00	0.50
3.94	114.72	0.45	0.39	125.00	0.00	0.50
4.92	102.34	0.40	0.39	125.00	0.00	0.50
5.91	65.18	0.44	0.68	125.00	0.00	0.50
6.89	85.40	0.39	0.46	125.00	0.00	0.50
7.87	121.09	0.70	0.58	125.00	0.00	0.50
8.86	125.99	1.27	1.01	125.00	0.00	0.50
9.84	180.83	1.01	0.56	125.00	0.00	0.50
10.83	128.88	0.72	0.56	125.00	0.00	0.50
11.81	130.56	0.65	0.50	125.00	0.00	0.50
12.80	84.51	0.79	0.94	125.00	0.00	0.50
13.78	137.21	0.54	0.40	125.00	0.00	0.50
14.76	55.42	1.59	2.86	115.00	0.00	0.50
15.75	126.72	1.78	1.41	125.00	0.00	0.50
16.73	185.25	0.88	0.47	125.00	0.00	0.50
17.72	60.34	1.50	2.49	120.00	0.00	0.50
18.70	10.67	0.53	4.96	115.00	0.00	0.50
19.69	45.33	1.32	2.92	115.00	0.00	0.50
20.67	70.49	1.39	1.97	120.00	0.00	0.50
21.65	16.47	0.90	5.46	115.00	0.00	0.50
22.64	180.48	1.08	0.60	125.00	0.00	0.50
23.62	123.12	1.93	1.56	120.00	0.00	0.50
24.61	61.25	1.70	2.78	115.00	0.00	0.50
25.59	99.52	1.67	1.68	120.00	0.00	0.50
26.57	19.58	1.56	7.98	115.00	0.00	0.50
27.56	97.42	1.96	2.02	120.00	0.00	0.50
28.54	76.80	3.34	4.35	115.00	0.00	0.50
29.53	15.75	0.41	2.58	115.00	0.00	0.50
30.51	25.66	1.42	5.54	115.00	0.00	0.50
31.50	39.33	2.29	5.82	115.00	0.00	0.50
32.48	117.91	1.63	1.38	120.00	0.00	0.50
33.46	32.68	1.38	4.24	115.00	0.00	0.50
34.45	270.70	1.55	0.57	125.00	0.00	0.50
35.43	309.80	1.61	0.52	125.00	0.00	0.50
36.42	53.05	1.56	2.93	115.00	0.00	0.50
37.40	37.43	2.39	6.38	115.00	0.00	0.50
38.39	299.25	1.82	0.61	125.00	0.00	0.50
39.37	299.89	1.13	0.38	125.00	0.00	0.50
40.35	86.23	3.04	3.52	115.00	0.00	0.50
41.34	240.37	2.33	0.97	125.00	0.00	0.50
42.32	229.00	2.74	1.20	125.00	0.00	0.50
43.31	37.65	1.38	3.67	115.00	0.00	0.50
44.29	71.19	3.54	4.97	115.00	0.00	0.50
45.28	78.30	4.07	5.20	115.00	0.00	0.50
46.26	183.80	4.17	2.27	120.00	0.00	0.50
47.24	290.15	2.86	0.99	125.00	0.00	0.50
48.23	260.47	2.50	0.96	125.00	0.00	0.50
49.21	268.36	2.14	0.80	125.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	115.00	0.000	115.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	125.00	0.056	125.00	0.056	1.00	0.000	1.046	0.68	1.30	0.88
2.00	125.00	0.115	125.00	0.115	1.00	0.000	1.046	0.68	1.30	0.88
3.00	125.00	0.174	125.00	0.174	0.99	0.000	1.046	0.68	1.30	0.88
4.00	125.00	0.233	125.00	0.233	0.99	0.000	1.046	0.67	1.30	0.88
5.00	125.00	0.292	125.00	0.292	0.99	0.000	1.046	0.67	1.30	0.87
6.00	125.00	0.351	125.00	0.351	0.99	0.000	1.046	0.67	1.30	0.87
7.00	125.00	0.410	125.00	0.410	0.98	0.000	1.046	0.67	1.30	0.87
8.00	125.00	0.469	125.00	0.469	0.98	0.000	1.046	0.67	1.30	0.87
9.00	125.00	0.528	125.00	0.528	0.98	0.000	1.046	0.67	1.30	0.87
10.00	125.00	0.587	62.60	0.587	0.98	0.000	1.046	0.66	1.30	0.86
11.00	125.00	0.646	62.60	0.617	0.97	0.000	1.046	0.69	1.30	0.90
12.00	125.00	0.706	62.60	0.647	0.97	0.000	1.046	0.72	1.30	0.94
13.00	125.00	0.765	62.60	0.676	0.97	0.000	1.046	0.75	1.30	0.97
14.00	125.00	0.824	62.60	0.706	0.97	0.000	1.046	0.77	1.30	1.00
15.00	120.00	0.881	57.60	0.734	0.97	0.000	1.046	0.79	1.30	1.02
16.00	125.00	0.940	62.60	0.763	0.96	0.000	1.046	0.81	1.30	1.05
17.00	125.00	0.999	62.60	0.793	0.96	0.000	1.046	0.82	1.30	1.07
18.00	115.00	1.057	52.60	0.821	0.96	0.000	1.046	0.84	1.30	1.09
19.00	115.00	1.112	52.60	0.846	0.96	0.000	1.046	0.85	1.30	1.11
20.00	115.00	1.166	52.60	0.871	0.95	0.000	1.046	0.87	1.30	1.13
21.00	115.00	1.221	52.60	0.897	0.95	0.000	1.046	0.88	1.30	1.14
22.00	125.00	1.276	62.60	0.922	0.95	0.000	1.046	0.89	1.30	1.16
23.00	125.00	1.335	62.60	0.951	0.95	0.000	1.046	0.90	1.30	1.17
24.00	120.00	1.393	57.60	0.980	0.94	0.000	1.046	0.91	1.30	1.19
25.00	115.00	1.448	52.60	1.005	0.94	0.000	1.046	0.92	1.30	1.20
26.00	120.00	1.504	57.60	1.033	0.94	0.000	1.046	0.93	1.30	1.21
27.00	120.00	1.559	57.60	1.058	0.94	0.000	1.046	0.94	1.30	1.22
28.00	125.00	1.616	62.60	1.086	0.93	0.000	1.046	0.95	1.30	1.23
29.00	115.00	1.673	52.60	1.112	0.93	0.000	1.046	0.95	1.30	1.24
30.00	115.00	1.727	52.60	1.137	0.93	0.000	1.046	0.96	1.30	1.25
31.00	120.00	1.782	57.60	1.162	0.92	0.000	1.046	0.96	1.30	1.25
32.00	115.00	1.837	52.60	1.188	0.91	0.000	1.046	0.96	1.30	1.25
33.00	115.00	1.893	52.60	1.215	0.91	0.000	1.046	0.96	1.30	1.25
34.00	115.00	1.947	52.60	1.239	0.90	0.000	1.046	0.96	1.30	1.25
35.00	125.00	2.005	62.60	1.268	0.89	0.000	1.046	0.96	1.30	1.24
36.00	125.00	2.064	62.60	1.298	0.88	0.000	1.046	0.95	1.30	1.24
37.00	115.00	2.120	52.60	1.324	0.87	0.000	1.046	0.95	1.30	1.24
38.00	125.00	2.176	62.60	1.350	0.86	0.000	1.046	0.95	1.30	1.23
39.00	125.00	2.235	62.60	1.380	0.86	0.000	1.046	0.94	1.30	1.23
40.00	125.00	2.294	62.60	1.409	0.85	0.000	1.046	0.94	1.30	1.22
41.00	120.00	2.350	57.60	1.436	0.84	0.000	1.046	0.94	1.30	1.22
42.00	125.00	2.408	62.60	1.465	0.83	0.000	1.046	0.93	1.30	1.21
43.00	115.00	2.466	52.60	1.493	0.82	0.000	1.046	0.93	1.30	1.20
44.00	115.00	2.521	52.60	1.518	0.82	0.000	1.046	0.92	1.30	1.20
45.00	115.00	2.575	52.60	1.543	0.81	0.000	1.046	0.92	1.30	1.19
46.00	120.00	2.630	57.60	1.568	0.80	0.000	1.046	0.91	1.30	1.19
47.00	125.00	2.687	62.60	1.596	0.79	0.000	1.046	0.91	1.30	1.18
48.00	125.00	2.746	62.60	1.625	0.78	0.000	1.046	0.90	1.30	1.17
49.00	125.00	2.805	62.60	1.655	0.78	0.000	1.046	0.89	1.30	1.16
50.00	125.00	2.864	62.60	1.685	0.77	0.000	1.046	0.89	1.30	1.15

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	2.47E6	0.90	3.15						
0.00	24.66	0.22	1.00	2.47E6	0.90	3.15	1.00	NoLiq	1.00	24.66	24.66	2.08
1.00			1.00	2.55E3	0.55	0.96						
1.00			0.50	6.02E2	0.55	1.18						
1.00	142.05	0.78	0.50	6.02E2	0.55	1.18	4.23	0.00	0.00	500.00	500.00	2.08
2.00			1.00	1.38E3	0.66	1.09						
2.00			0.50	4.66E2	0.66	1.31						
2.00	158.04	1.03	0.50	4.66E2	0.66	1.31	2.95	0.51	0.00	466.36	466.36	2.08
3.00			1.00	7.30E2	0.90	1.32						
3.00			0.50	3.05E2	0.90	1.53						
3.00	127.16	1.15	0.50	3.05E2	0.90	1.53	2.40	3.33	0.00	304.92	304.92	2.08
4.00			1.00	4.91E2	0.39	1.13						
4.00			0.50	2.38E2	0.39	1.36						
4.00	114.72	0.45	0.50	2.38E2	0.39	1.36	2.07	1.09	0.00	237.68	237.68	1.33
5.00			1.00	3.49E2	0.39	1.23						
5.00			0.50	1.89E2	0.39	1.44						
5.00	102.34	0.40	0.50	1.89E2	0.39	1.44	1.85	2.08	0.00	189.37	189.37	0.71
6.00			1.00	1.85E2	0.69	1.60						
6.00			0.50	1.10E2	0.69	1.78						
6.00	65.18	0.44	0.50	1.10E2	0.69	1.78	1.69	7.63	0.07	110.00	118.30	0.23
7.00			1.00	2.07E2	0.46	1.45						

7.00			0.50	1.33E2	0.46	1.61						
7.00	85.40	0.39	0.50	1.33E2	0.46	1.61	1.56	4.53	0.00	133.34	133.34	0.30
8.00			1.00	2.57E2	0.58	1.45						
8.00			0.50	1.77E2	0.58	1.57						
8.00	121.09	0.70	0.50	1.77E2	0.58	1.57	1.46	3.88	0.00	176.77	176.77	0.59
9.00			1.00	2.37E2	1.01	1.64						
9.00			0.50	1.73E2	1.01	1.74						
9.00	125.99	1.27	0.50	1.73E2	1.01	1.74	1.38	6.81	0.05	173.34	182.15	0.64
10.00			1.00	3.07E2	0.56	1.38						
10.00			0.50	2.36E2	0.56	1.46						
10.00	180.83	1.01	0.50	2.36E2	0.56	1.46	1.30	2.33	0.00	235.94	235.94	1.30
11.00			1.00	1.69E2	0.46	1.52						
11.00			0.50	1.37E2	0.46	1.60						
11.00	109.82	0.50	0.50	1.37E2	0.46	1.60	1.24	4.36	0.00	136.59	136.59	0.32
12.00			1.00	2.31E2	0.44	1.40						
12.00			0.50	1.95E2	0.44	1.46						
12.00	163.79	0.71	0.50	1.95E2	0.44	1.46	1.19	2.30	0.00	195.00	195.00	0.77
13.00			1.00	1.08E2	1.00	1.88						
13.00			0.50	9.57E1	1.00	1.93						
13.00	83.69	0.83	0.50	9.57E1	1.00	1.93	1.14	11.03	0.16	95.71	114.06	0.22
14.00			1.00	1.55E2	0.46	1.56						
14.00			0.50	1.41E2	0.46	1.59						
14.00	128.09	0.58	0.50	1.41E2	0.46	1.59	1.10	4.16	0.00	141.14	141.14	0.34
15.00			1.00	6.09E1	2.31	2.31						
15.00			0.50	5.81E1	2.31	2.33						
15.00	54.55	1.24	0.50	5.81E1	2.31	2.33	1.07	23.56	0.50	58.12	115.23	0.22
16.00			1.00	1.21E2	1.51	1.97						
16.00			0.50	1.18E2	1.51	1.98						
16.00	114.50	1.71	0.50	1.18E2	1.51	1.98	1.03	12.34	0.20	118.10	146.91	0.37
17.00			1.00	1.80E2	0.41	1.47						
17.00			0.50	1.81E2	0.41	1.47						
17.00	180.75	0.73	0.50	1.81E2	0.41	1.47	1.00	2.40	0.00	180.84	180.84	0.63
18.00			1.00	2.92E1	4.27	2.73						
18.00	31.88	1.32	1.00	2.92E1	4.27	2.73	1.00	NoLiq	1.00	31.88	31.88	2.08
19.00			1.00	7.38E0	7.71	3.35						
19.00	9.32	0.63	1.00	7.38E0	7.71	3.35	1.00	NoLiq	1.00	9.32	9.32	2.08
20.00			1.00	4.32E1	3.43	2.54						
20.00			0.50	4.77E1	3.43	2.51						
20.00	51.51	1.72	0.50	4.77E1	3.43	2.51	0.93	31.03	0.69	47.70	156.36	0.44
21.00			1.00	3.78E1	2.70	2.51						
21.00			0.50	4.29E1	2.70	2.47						
21.00	47.44	1.25	0.50	4.29E1	2.70	2.47	0.90	29.35	0.65	42.93	122.73	0.25
22.00			1.00	7.79E1	1.11	2.02						
22.00			0.50	8.91E1	1.11	1.98						
22.00	100.66	1.10	0.50	8.91E1	1.11	1.98	0.89	12.36	0.20	89.12	110.92	0.21
23.00			1.00	1.37E2	0.56	1.65						
23.00			0.50	1.60E2	0.56	1.59						
23.00	184.63	1.02	0.50	1.60E2	0.56	1.59	0.87	4.26	0.00	159.81	159.81	0.46
24.00			1.00	4.80E1	2.80	2.45						
24.00			0.50	5.72E1	2.80	2.39						
24.00	66.85	1.84	0.50	5.72E1	2.80	2.39	0.86	26.02	0.56	57.22	130.41	0.29
25.00			1.00	3.37E1	3.07	2.59						
25.00			0.50	4.10E1	3.07	2.52						
25.00	48.29	1.44	0.50	4.10E1	3.07	2.52	0.85	31.70	0.71	40.96	142.67	0.35
26.00			1.00	5.00E1	2.84	2.44						
26.00			0.50	6.08E1	2.84	2.38						
26.00	72.33	2.01	0.50	6.08E1	2.84	2.38	0.84	25.43	0.55	60.75	133.64	0.30
27.00			1.00	7.30E1	2.24	2.25						
27.00			0.50	8.90E1	2.24	2.19						
27.00	106.90	2.36	0.50	8.90E1	2.24	2.19	0.83	18.54	0.36	89.00	139.38	0.33
28.00			1.00	1.20E2	0.93	1.83						
28.00			0.50	1.46E2	0.93	1.76						
28.00	177.51	1.64	0.50	1.46E2	0.93	1.76	0.82	7.38	0.06	146.39	156.33	0.44
29.00			1.00	3.77E1	3.83	2.62						
29.00	58.04	2.16	1.00	3.77E1	3.83	2.62	1.00	NoLiq	1.00	58.04	58.04	2.08
30.00			1.00	8.37E0	2.82	3.05						
30.00	14.47	0.36	1.00	8.37E0	2.82	3.05	1.00	NoLiq	1.00	14.47	14.47	2.08
31.00			1.00	5.64E1	2.93	2.41						
31.00			0.50	7.16E1	2.93	2.33						
31.00	89.05	2.55	0.50	7.16E1	2.93	2.33	0.80	23.84	0.50	71.59	144.04	0.36
32.00			1.00	2.97E1	3.87	2.69						
32.00	48.54	1.81	1.00	2.97E1	3.87	2.69	1.00	NoLiq	1.00	48.54	48.54	2.08
33.00			1.00	4.03E1	3.18	2.54						
33.00			0.50	5.25E1	3.18	2.45						
33.00	66.40	2.05	0.50	5.25E1	3.18	2.45	0.79	28.71	0.63	52.50	143.08	0.35
34.00			1.00	2.58E1	4.47	2.78						
34.00	43.90	1.87	1.00	2.58E1	4.47	2.78	1.00	NoLiq	1.00	43.90	43.90	2.08
35.00			1.00	1.96E2	0.56	1.53						
35.00			0.50	2.53E2	0.56	1.44						
35.00	325.27	1.81	0.50	2.53E2	0.56	1.44	0.78	2.03	0.00	253.01	253.01	1.59
36.00			1.00	1.38E2	0.72	1.71						
36.00			0.50	1.81E2	0.72	1.62						
36.00	234.24	1.66	0.50	1.81E2	0.72	1.62	0.77	4.71	0.00	180.59	180.59	0.63
37.00			1.00	1.22E1	2.84	2.91						
37.00	23.01	0.59	1.00	1.22E1	2.84	2.91	1.00	NoLiq	1.00	23.01	23.01	2.08
38.00			1.00	1.26E2	0.61	1.70						
38.00			0.50	1.67E2	0.61	1.60						
38.00	220.03	1.32	0.50	1.67E2	0.61	1.60	0.76	4.36	0.00	167.04	167.04	0.51
39.00			1.00	1.83E2	0.55	1.54						
39.00			0.50	2.45E2	0.55	1.44						

39.00	325.67	1.77	0.50	2.45E2	0.55	1.44	0.75	2.08	0.00	245.16	245.16	1.45
40.00			1.00	1.43E2	0.45	1.58						
40.00			0.50	1.93E2	0.45	1.47						
40.00	258.13	1.16	0.50	1.93E2	0.45	1.47	0.75	2.48	0.00	192.71	192.71	0.75
41.00			1.00	5.13E1	2.98	2.44						
41.00			0.50	7.10E1	2.98	2.34						
41.00	95.84	2.79	0.50	7.10E1	2.98	2.34	0.74	24.17	0.51	71.03	145.48	0.37
42.00			1.00	1.65E2	0.76	1.67						
42.00			0.50	2.26E2	0.76	1.57						
42.00	306.90	2.32	0.50	2.26E2	0.76	1.57	0.74	3.85	0.00	225.67	225.67	1.15
43.00			1.00	3.11E1	3.25	2.63						
43.00	60.90	1.90	1.00	3.11E1	3.25	2.63	1.00	NoLiq	1.00	60.90	60.90	2.08
44.00			1.00	5.43E1	4.27	2.54						
44.00			0.50	7.67E1	4.27	2.44						
44.00	105.85	4.42	0.50	7.67E1	4.27	2.44	0.72	27.94	0.61	76.74	197.99	0.80
45.00			1.00	4.97E1	5.00	2.61						
45.00	98.29	4.79	1.00	4.97E1	5.00	2.61	1.00	NoLiq	1.00	98.29	98.29	2.08
46.00			1.00	9.55E1	3.60	2.32						
46.00			0.50	1.35E2	3.60	2.22						
46.00	189.16	6.72	0.50	1.35E2	3.60	2.22	0.72	19.83	0.40	135.36	224.08	1.13
47.00			1.00	1.24E2	1.36	1.93						
47.00			0.50	1.76E2	1.36	1.82						
47.00	247.78	3.32	0.50	1.76E2	1.36	1.82	0.71	8.65	0.10	176.06	195.05	0.77
48.00			1.00	1.32E2	1.02	1.83						
48.00			0.50	1.88E2	1.02	1.71						
48.00	267.22	2.70	0.50	1.88E2	1.02	1.71	0.71	6.38	0.04	188.47	195.67	0.78
49.00			1.00	1.27E2	0.75	1.75						
49.00			0.50	1.83E2	0.75	1.63						
49.00	261.07	1.93	0.50	1.83E2	0.75	1.63	0.70	4.85	0.00	182.79	182.79	0.65
50.00			1.00	1.25E2	0.99	1.83						
50.00			0.50	1.81E2	0.99	1.72						
50.00	260.65	2.55	0.50	1.81E2	0.99	1.72	0.70	6.42	0.04	181.19	188.31	0.70

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 23.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.00	0.88	5.00 ^
1.00	0.04	2.08	1.00	2.08	1.16	2.41	0.88	5.00
2.00	0.07	2.08	1.00	2.08	1.16	2.41	0.88	5.00
3.00	0.11	2.08	1.00	2.08	1.16	2.41	0.88	5.00
4.00	0.15	1.33	1.00	1.33	1.16	1.54	0.88	5.00
5.00	0.19	0.71	1.00	0.71	1.16	0.82	0.87	5.00
6.00	0.23	0.23	1.00	0.23	1.16	0.27	0.87	5.00
7.00	0.27	0.30	1.00	0.30	1.16	0.35	0.87	5.00
8.00	0.31	0.59	1.00	0.59	1.16	0.69	0.87	5.00
9.00	0.34	0.64	1.00	0.64	1.16	0.74	0.87	5.00
10.00	0.38	1.30	1.00	1.30	1.16	1.51	0.86	1.75
11.00	0.42	0.32	1.00	0.32	1.16	0.37	0.90	0.41 *
12.00	0.46	0.77	1.00	0.77	1.16	0.89	0.94	0.95 *
13.00	0.50	0.22	1.00	0.22	1.16	0.25	0.97	0.26 *
14.00	0.54	0.34	1.00	0.34	1.16	0.40	1.00	0.40 *
15.00	0.57	0.22	1.00	0.22	1.16	0.26	1.02	0.25 *
16.00	0.61	0.37	1.00	0.37	1.16	0.43	1.05	0.41 *
17.00	0.65	0.63	1.00	0.63	1.16	0.73	1.07	0.68 *
18.00	0.69	2.08	1.00	2.08	1.16	2.00	1.09	5.00 ^
19.00	0.72	2.08	1.00	2.08	1.16	2.00	1.11	5.00 ^
20.00	0.76	0.44	1.00	0.44	1.16	0.50	1.13	0.45 *
21.00	0.79	0.25	1.00	0.25	1.16	0.29	1.14	0.26 *
22.00	0.83	0.21	1.00	0.21	1.16	0.24	1.16	0.21 *
23.00	0.87	0.46	1.00	0.46	1.16	0.53	1.17	0.45 *
24.00	0.89	0.29	1.00	0.29	1.16	0.33	1.19	0.28 *
25.00	0.90	0.35	1.00	0.35	1.16	0.41	1.20	0.34 *
26.00	0.92	0.30	1.00	0.30	1.16	0.35	1.21	0.29 *
27.00	0.94	0.33	1.00	0.33	1.16	0.38	1.22	0.31 *
28.00	0.96	0.44	1.00	0.44	1.16	0.50	1.23	0.41 *
29.00	0.97	2.08	1.00	2.08	1.16	2.00	1.24	5.00 ^
30.00	0.99	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
31.00	1.01	0.36	1.01	0.36	1.16	0.42	1.25	0.33 *
32.00	1.02	2.08	1.00	2.09	1.16	2.00	1.25	5.00 ^
33.00	1.04	0.35	1.00	0.35	1.16	0.41	1.25	0.33 *
34.00	1.06	2.08	1.00	2.07	1.16	2.00	1.25	5.00 ^
35.00	1.07	1.59	0.99	1.58	1.16	1.83	1.24	1.47
36.00	1.09	0.63	0.99	0.62	1.16	0.72	1.24	0.58 *
37.00	1.11	2.08	0.99	2.06	1.16	2.00	1.24	5.00 ^
38.00	1.13	0.51	0.99	0.51	1.16	0.59	1.23	0.48 *
39.00	1.15	1.45	0.98	1.43	1.16	1.65	1.23	1.35
40.00	1.17	0.75	0.98	0.73	1.16	0.85	1.22	0.69 *
41.00	1.18	0.37	0.98	0.36	1.16	0.41	1.22	0.34 *
42.00	1.20	1.15	0.97	1.12	1.16	1.30	1.21	1.07
43.00	1.22	2.08	0.97	2.02	1.16	2.00	1.20	5.00 ^
44.00	1.24	0.80	0.97	0.78	1.16	0.90	1.20	0.75 *
45.00	1.25	2.08	0.97	2.01	1.16	2.00	1.19	5.00 ^
46.00	1.27	1.13	0.97	1.09	1.16	1.26	1.19	1.06
47.00	1.29	0.77	0.96	0.74	1.16	0.86	1.18	0.73 *
48.00	1.31	0.78	0.96	0.75	1.16	0.86	1.17	0.74 *
49.00	1.33	0.65	0.96	0.62	1.16	0.72	1.16	0.62 *
50.00	1.35	0.70	0.95	0.67	1.16	0.77	1.15	0.67 *

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	3.15	2.68	24.66	9.20	NoLiq	0.00	9.20
1.00	1.18	6.31	500.00	79.18	0.00	0.00	79.18
2.00	1.31	6.08	466.36	76.71	0.51	0.00	76.71
3.00	1.53	5.67	304.92	53.82	3.33	0.00	53.82
4.00	1.36	5.98	237.68	39.74	1.09	0.00	39.74
5.00	1.44	5.83	189.37	32.48	2.08	0.00	32.48
6.00	1.78	5.22	118.30	22.68	7.63	0.00	22.68
7.00	1.61	5.52	133.34	24.14	4.53	0.00	24.14
8.00	1.57	5.60	176.77	31.57	3.88	0.00	31.57
9.00	1.74	5.29	182.15	34.42	6.81	0.00	34.42
10.00	1.46	5.80	235.94	40.71	2.33	0.00	40.71
11.00	1.60	5.54	136.59	24.64	4.36	0.00	24.64
12.00	1.46	5.80	195.00	33.62	2.30	0.00	33.62
13.00	1.93	4.94	114.06	23.08	11.03	0.00	23.08
14.00	1.59	5.57	141.14	25.36	4.16	0.00	25.36
15.00	2.33	4.20	115.23	27.45	23.56	0.00	27.45
16.00	1.98	4.85	146.91	30.31	12.34	0.00	30.31
17.00	1.47	5.79	180.84	31.25	2.40	0.00	31.25
18.00	2.73	3.46	31.88	9.22	NoLiq	0.00	9.22
19.00	3.35	2.31	9.32	4.03	NoLiq	0.00	4.03
20.00	2.51	3.87	156.36	40.44	31.03	0.00	40.44
21.00	2.47	3.94	122.73	31.18	29.35	0.00	31.18
22.00	1.98	4.84	110.92	22.89	12.36	0.00	22.89
23.00	1.59	5.56	159.81	28.77	4.26	0.00	28.77
24.00	2.39	4.08	130.41	31.94	26.02	0.00	31.94
25.00	2.52	3.84	142.67	37.16	31.70	0.00	37.16
26.00	2.38	4.11	133.64	32.51	25.43	0.00	32.51
27.00	2.19	4.46	139.38	31.25	18.54	0.00	31.25
28.00	1.76	5.24	156.33	29.84	7.38	0.00	29.84
29.00	2.62	3.67	58.04	15.83	NoLiq	0.00	15.83
30.00	3.05	2.87	14.47	5.04	NoLiq	0.00	5.04
31.00	2.33	4.19	144.04	34.41	23.84	0.00	34.41
32.00	2.69	3.52	48.54	13.78	NoLiq	0.00	13.78
33.00	2.45	3.96	143.08	36.10	28.71	0.00	36.10
34.00	2.78	3.36	43.90	13.06	NoLiq	0.00	13.06
35.00	1.44	5.84	253.01	43.34	2.03	0.00	43.34
36.00	1.62	5.50	180.59	32.81	4.71	0.00	32.81
37.00	2.91	3.12	23.01	7.38	NoLiq	0.00	7.38
38.00	1.60	5.54	167.04	30.13	4.36	0.00	30.13
39.00	1.44	5.83	245.16	42.05	2.08	0.00	42.05
40.00	1.47	5.78	192.71	33.37	2.48	0.00	33.37
41.00	2.34	4.17	145.48	34.89	24.17	0.00	34.89
42.00	1.57	5.60	225.67	40.28	3.85	0.00	40.28
43.00	2.63	3.64	60.90	16.72	NoLiq	0.00	16.72
44.00	2.44	4.00	197.99	49.53	27.94	0.00	49.53
45.00	2.61	3.67	98.29	26.78	NoLiq	0.00	26.78
46.00	2.22	4.39	224.08	51.05	19.83	0.00	51.05
47.00	1.82	5.13	195.05	38.03	8.65	0.00	38.03
48.00	1.71	5.33	195.67	36.69	6.38	0.00	36.69
49.00	1.63	5.49	182.79	33.30	4.85	0.00	33.30
50.00	1.72	5.33	188.31	35.33	6.42	0.00	35.33

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.00	1.15	1.00	1.15	0.67	6.42	35.33	100.00	0.000	0.0E0	0.000	0.000
49.00	1.16	1.00	1.16	0.62	4.85	33.30	98.05	0.211	1.3E-3	0.003	0.003
48.00	1.17	1.00	1.17	0.74	6.38	36.69	100.00	0.000	0.0E0	0.018	0.021
47.00	1.18	1.00	1.18	0.73	8.65	38.03	100.00	0.000	0.0E0	0.000	0.021
46.00	1.19	1.00	1.19	1.06	19.83	51.05	100.00	0.000	0.0E0	0.000	0.021
45.00	1.19	1.00	1.19	5.00	NoLiq	26.78	83.20	0.000	0.0E0	0.000	0.021
44.00	1.20	1.00	1.20	0.75	27.94	49.53	100.00	0.000	0.0E0	0.000	0.021
43.00	1.20	1.00	1.20	5.00	NoLiq	16.72	64.55	0.000	0.0E0	0.000	0.021
42.00	1.21	1.00	1.21	1.07	3.85	40.28	100.00	0.000	0.0E0	0.000	0.021
41.00	1.22	1.00	1.22	0.34	24.17	34.89	100.00	0.000	0.0E0	0.013	0.034
40.00	1.22	1.00	1.22	0.69	2.48	33.37	98.23	0.171	1.0E-3	0.001	0.035
39.00	1.23	1.00	1.23	1.35	2.08	42.05	100.00	0.000	0.0E0	0.002	0.037
38.00	1.23	1.00	1.23	0.48	4.36	30.13	90.36	1.256	7.5E-3	0.028	0.065
37.00	1.24	1.00	1.24	5.00	NoLiq	7.38	43.79	0.000	0.0E0	0.044	0.110
36.00	1.24	1.00	1.24	0.58	4.71	32.81	96.78	0.369	2.2E-3	0.045	0.155
35.00	1.24	1.00	1.24	1.47	2.03	43.34	100.00	0.000	0.0E0	0.002	0.157
34.00	1.25	1.00	1.25	5.00	NoLiq	13.06	57.36	0.000	0.0E0	0.058	0.215
33.00	1.25	1.00	1.25	0.33	28.71	36.10	100.00	0.000	0.0E0	0.000	0.215
32.00	1.25	1.00	1.25	5.00	NoLiq	13.78	58.85	0.000	0.0E0	0.064	0.279
31.00	1.25	1.00	1.25	0.33	23.84	34.41	100.00	0.000	0.0E0	0.026	0.305
30.00	1.25	1.00	1.25	5.00	NoLiq	5.04	36.88	0.000	0.0E0	0.000	0.305
29.00	1.24	1.00	1.24	5.00	NoLiq	15.83	62.87	0.000	0.0E0	0.000	0.305
28.00	1.23	1.00	1.23	0.41	7.38	29.84	89.69	1.333	8.0E-3	0.024	0.329
27.00	1.22	1.00	1.22	0.31	18.54	31.25	92.95	0.932	5.6E-3	0.078	0.407
26.00	1.21	1.00	1.21	0.29	25.43	32.51	96.03	0.525	3.1E-3	0.034	0.441
25.00	1.20	1.00	1.20	0.34	31.70	37.16	100.00	0.000	0.0E0	0.136	0.577
24.00	1.19	1.00	1.19	0.28	26.02	31.94	94.62	0.712	4.3E-3	0.024	0.601
23.00	1.17	1.00	1.17	0.45	4.26	28.77	87.34	1.425	8.5E-3	0.127	0.729
22.00	1.16	1.00	1.16	0.21	12.36	22.89	75.78	1.936	1.2E-2	0.192	0.921
21.00	1.14	1.00	1.14	0.26	29.35	31.18	92.79	0.954	5.7E-3	0.006	0.926
20.00	1.13	1.00	1.13	0.45	31.03	40.44	100.00	0.000	0.0E0	0.098	1.025

19.00	1.11	1.00	1.11	5.00	NoLiq	4.03	33.58	0.000	0.0E0	0.000	1.025
18.00	1.09	1.00	1.09	5.00	NoLiq	9.22	48.63	0.000	0.0E0	0.000	1.025
17.00	1.07	1.00	1.07	0.68	2.40	31.25	92.96	0.691	4.1E-3	0.145	1.170
16.00	1.05	1.00	1.05	0.41	12.34	30.31	90.77	1.218	7.3E-3	0.082	1.252
15.00	1.02	1.00	1.02	0.25	23.56	27.45	84.56	1.553	9.3E-3	0.140	1.392
14.00	1.00	1.00	1.00	0.40	4.16	25.36	80.40	1.729	1.0E-2	0.154	1.546
13.00	0.97	1.00	0.97	0.26	11.03	23.08	76.12	1.920	1.2E-2	0.205	1.750
12.00	0.94	1.00	0.94	0.95	2.30	33.62	98.88	0.060	3.6E-4	0.139	1.889
11.00	0.90	1.00	0.90	0.41	4.36	24.64	79.03	1.790	1.1E-2	0.213	2.102
10.00	0.86	1.00	0.86	1.75	2.33	40.71	100.00	0.000	0.0E0	0.022	2.125

Settlement of Saturated Sands=2.125 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth ft	sigma' atm	sigC' atm	(N1)60s	CSRsf	Gmax atm	g*Ge/Gm	g_eff	ec7.5 %	Cec	ec %	dsz in.	dsp in.	S in.
8.00	0.47	0.31	31.57	0.87	779.70	5.2E-4	1.0000	0.5251	0.95	0.4994	5.99E-3	0.104	0.149
7.00	0.41	0.27	24.14	0.87	666.64	5.3E-4	1.0000	0.7705	0.95	0.7328	8.79E-3	0.150	0.346
0.00	0.00	0.00	9.20	0.88	2.39	3.7E-6	0.0010	0.0026	0.95	0.0025	0.00E0	0.002	0.349

Unsaturated Sands from 1-6 feet and 8-10 feet are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0..349in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.474 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude

ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

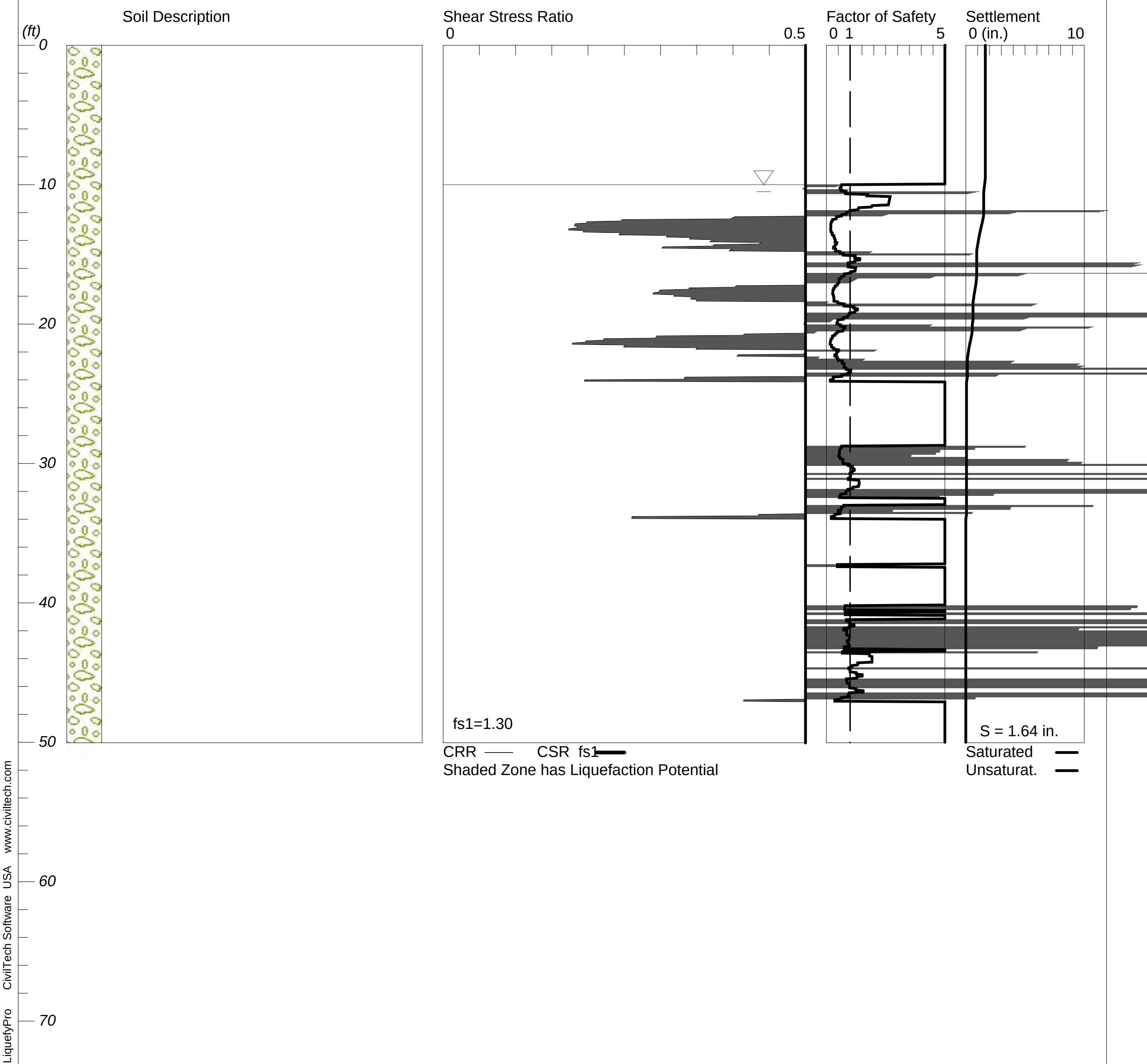
Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS

San Juan School

Hole No.=CPT-6 Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



Moore Twining Associates, Inc. E83701.03

Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS
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Input File Name: UNTITLED
Title: San Juan School
Subtitle: E83701.03

Input Data:

Surface Elev.=
Hole No.=CPT-6
Depth of Hole=50.03 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 28.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	571.72	2.75	0.48	130.00	0.00	0.50
0.98	268.35	4.79	1.78	125.00	0.00	0.50
1.97	47.74	1.42	2.97	120.00	0.00	0.50
2.95	42.70	2.13	4.99	115.00	0.00	0.50
3.94	39.16	2.36	6.02	115.00	0.00	0.50
4.92	36.02	2.20	6.12	115.00	0.00	0.50
5.91	97.16	1.49	1.54	125.00	0.00	0.50
6.89	146.56	1.10	0.75	125.00	0.00	0.50
7.87	152.34	0.80	0.52	125.00	0.00	0.50
8.86	211.47	1.10	0.52	125.00	0.00	0.50
9.84	123.14	0.68	0.55	125.00	0.00	0.50
10.83	227.40	1.99	0.87	125.00	0.00	0.50
11.81	162.89	0.70	0.43	125.00	0.00	0.50
12.80	66.95	0.49	0.74	125.00	0.00	0.50
13.78	112.50	0.73	0.65	125.00	0.00	0.50
14.76	121.49	2.01	1.66	125.00	0.00	0.50
15.75	191.87	1.24	0.65	125.00	0.00	0.50
16.73	161.22	1.15	0.71	125.00	0.00	0.50
17.72	79.63	1.39	1.75	120.00	0.00	0.50
18.70	232.30	1.80	0.78	125.00	0.00	0.50
19.69	165.05	1.31	0.79	125.00	0.00	0.50
20.67	158.35	0.56	0.35	125.00	0.00	0.50
21.65	136.23	1.12	0.82	125.00	0.00	0.50
22.64	186.53	2.54	1.36	125.00	0.00	0.50
23.62	210.89	1.84	0.87	125.00	0.00	0.50
24.61	26.10	1.23	4.71	115.00	0.00	0.50
25.59	25.08	0.62	2.47	115.00	0.00	0.50
26.57	14.95	0.57	3.79	115.00	0.00	0.50
27.56	19.22	0.64	3.32	115.00	0.00	0.50
28.54	49.54	3.71	7.49	115.00	0.00	0.50
29.53	189.13	3.09	1.63	125.00	0.00	0.50
30.51	278.48	3.44	1.24	125.00	0.00	0.50
31.50	199.28	6.86	3.44	120.00	0.00	0.50
32.48	60.38	4.05	6.71	115.00	0.00	0.50
33.46	217.42	2.60	1.20	125.00	0.00	0.50
34.45	30.49	0.88	2.88	115.00	0.00	0.50
35.43	26.79	0.58	2.15	115.00	0.00	0.50
36.42	29.50	2.33	7.90	115.00	0.00	0.50
37.40	66.34	2.50	3.77	115.00	0.00	0.50
38.39	28.68	1.12	3.90	115.00	0.00	0.50
39.37	50.05	2.38	4.75	115.00	0.00	0.50
40.35	116.97	5.07	4.33	115.00	0.00	0.50
41.34	151.40	6.07	4.01	120.00	0.00	0.50
42.32	247.12	4.96	2.01	125.00	0.00	0.50
43.31	94.48	4.44	4.70	115.00	0.00	0.50
44.29	337.30	3.94	1.17	125.00	0.00	0.50
45.28	316.44	4.58	1.45	125.00	0.00	0.50
46.26	373.19	3.32	0.89	125.00	0.00	0.50
47.24	48.61	1.48	3.05	115.00	0.00	0.50
48.23	26.57	0.41	1.56	115.00	0.00	0.50
49.21	27.27	0.63	2.32	115.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	130.00	0.000	130.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	125.00	0.061	125.00	0.061	1.00	0.000	1.046	0.68	1.30	0.88
2.00	120.00	0.117	120.00	0.117	1.00	0.000	1.046	0.68	1.30	0.88
3.00	115.00	0.171	115.00	0.171	0.99	0.000	1.046	0.68	1.30	0.88
4.00	115.00	0.226	115.00	0.226	0.99	0.000	1.046	0.67	1.30	0.88
5.00	115.00	0.281	115.00	0.281	0.99	0.000	1.046	0.67	1.30	0.87
6.00	125.00	0.337	125.00	0.337	0.99	0.000	1.046	0.67	1.30	0.87
7.00	125.00	0.396	125.00	0.396	0.98	0.000	1.046	0.67	1.30	0.87
8.00	125.00	0.455	125.00	0.455	0.98	0.000	1.046	0.67	1.30	0.87
9.00	125.00	0.514	125.00	0.514	0.98	0.000	1.046	0.67	1.30	0.87
10.00	125.00	0.573	62.60	0.573	0.98	0.000	1.046	0.66	1.30	0.86
11.00	125.00	0.632	62.60	0.603	0.97	0.000	1.046	0.69	1.30	0.90
12.00	125.00	0.691	62.60	0.632	0.97	0.000	1.046	0.72	1.30	0.94
13.00	125.00	0.751	62.60	0.662	0.97	0.000	1.046	0.75	1.30	0.97
14.00	125.00	0.810	62.60	0.692	0.97	0.000	1.046	0.77	1.30	1.00
15.00	125.00	0.869	62.60	0.721	0.97	0.000	1.046	0.79	1.30	1.03
16.00	125.00	0.928	62.60	0.751	0.96	0.000	1.046	0.81	1.30	1.05
17.00	125.00	0.987	62.60	0.780	0.96	0.000	1.046	0.83	1.30	1.07
18.00	120.00	1.045	57.60	0.809	0.96	0.000	1.046	0.84	1.30	1.09
19.00	125.00	1.103	62.60	0.838	0.96	0.000	1.046	0.86	1.30	1.11
20.00	125.00	1.162	62.60	0.868	0.95	0.000	1.046	0.87	1.30	1.13
21.00	125.00	1.222	62.60	0.897	0.95	0.000	1.046	0.88	1.30	1.14
22.00	125.00	1.280	62.60	0.926	0.95	0.000	1.046	0.89	1.30	1.16
23.00	125.00	1.339	62.60	0.956	0.95	0.000	1.046	0.90	1.30	1.17
24.00	120.00	1.398	57.60	0.985	0.94	0.000	1.046	0.91	1.30	1.18
25.00	115.00	1.453	52.60	1.011	0.94	0.000	1.046	0.92	1.30	1.20
26.00	115.00	1.507	52.60	1.036	0.94	0.000	1.046	0.93	1.30	1.21
27.00	115.00	1.562	52.60	1.060	0.94	0.000	1.046	0.94	1.30	1.22
28.00	115.00	1.616	52.60	1.085	0.93	0.000	1.046	0.95	1.30	1.23
29.00	120.00	1.671	57.60	1.110	0.93	0.000	1.046	0.95	1.30	1.24
30.00	125.00	1.728	62.60	1.139	0.93	0.000	1.046	0.96	1.30	1.25
31.00	120.00	1.787	57.60	1.168	0.92	0.000	1.046	0.96	1.30	1.25
32.00	120.00	1.843	57.60	1.195	0.91	0.000	1.046	0.96	1.30	1.25
33.00	115.00	1.899	52.60	1.220	0.91	0.000	1.046	0.96	1.30	1.25
34.00	115.00	1.955	52.60	1.247	0.90	0.000	1.046	0.96	1.30	1.24
35.00	115.00	2.010	52.60	1.272	0.89	0.000	1.046	0.95	1.30	1.24
36.00	115.00	2.064	52.60	1.297	0.88	0.000	1.046	0.95	1.30	1.24
37.00	115.00	2.118	52.60	1.322	0.87	0.000	1.046	0.95	1.30	1.24
38.00	115.00	2.173	52.60	1.347	0.86	0.000	1.046	0.95	1.30	1.23
39.00	115.00	2.227	52.60	1.372	0.86	0.000	1.046	0.95	1.30	1.23
40.00	115.00	2.281	52.60	1.397	0.85	0.000	1.046	0.94	1.30	1.22
41.00	115.00	2.336	52.60	1.421	0.84	0.000	1.046	0.94	1.30	1.22
42.00	125.00	2.390	62.60	1.447	0.83	0.000	1.046	0.93	1.30	1.22
43.00	120.00	2.448	57.60	1.475	0.82	0.000	1.046	0.93	1.30	1.21
44.00	125.00	2.505	62.60	1.502	0.82	0.000	1.046	0.92	1.30	1.20
45.00	125.00	2.563	62.60	1.531	0.81	0.000	1.046	0.92	1.30	1.20
46.00	125.00	2.621	62.60	1.559	0.80	0.000	1.046	0.91	1.30	1.19
47.00	120.00	2.679	57.60	1.588	0.79	0.000	1.046	0.91	1.30	1.18
48.00	115.00	2.734	52.60	1.613	0.78	0.000	1.046	0.90	1.30	1.17
49.00	115.00	2.788	52.60	1.638	0.78	0.000	1.046	0.90	1.30	1.17
50.00	115.00	2.843	52.60	1.663	0.77	0.000	1.046	0.89	1.30	1.16

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	5.72E7	0.48	4.38						
0.00	571.72	2.75	1.00	5.72E7	0.48	4.38	1.00	NoLiq	1.00	500.00	500.00	2.08
1.00			1.00	4.39E3	1.78	1.48						
1.00			0.50	1.09E3	1.78	1.53						
1.00	268.35	4.79	0.50	1.09E3	1.78	1.53	4.05	3.33	0.00	500.00	500.00	2.08
2.00			1.00	4.08E2	2.98	1.90						
2.00			0.50	1.40E2	2.98	2.15						
2.00	47.74	1.42	0.50	1.40E2	2.98	2.15	2.93	17.37	0.33	139.73	208.68	0.93
3.00			1.00	2.48E2	5.01	2.20						
3.00			0.50	1.03E2	5.01	2.41						
3.00	42.70	2.13	0.50	1.03E2	5.01	2.41	2.42	26.82	0.58	103.13	247.01	1.48
4.00			1.00	1.72E2	6.05	2.35						
4.00			0.50	8.24E1	6.05	2.53						
4.00	39.16	2.36	0.50	8.24E1	6.05	2.53	2.10	32.23	0.73	82.42	302.08	2.08
5.00			1.00	1.27E2	6.17	2.43						
5.00			0.50	6.80E1	6.17	2.59						
5.00	36.02	2.20	0.50	6.80E1	6.17	2.59	1.89	35.00	0.80	67.97	339.86	2.08
6.00			1.00	2.87E2	1.54	1.73						
6.00			0.50	1.67E2	1.54	1.88						
6.00	97.16	1.49	0.50	1.67E2	1.54	1.88	1.72	9.92	0.13	167.35	192.66	0.75
7.00			1.00	3.69E2	0.75	1.42						

7.00			0.50	2.33E2	0.75	1.55						
7.00	146.56	1.10	0.50	2.33E2	0.75	1.55	1.59	3.63	0.00	232.86	232.86	1.25
8.00			1.00	3.34E2	0.53	1.33						
8.00			0.50	2.26E2	0.53	1.46						
8.00	152.34	0.80	0.50	2.26E2	0.53	1.46	1.48	2.28	0.00	225.80	225.80	1.15
9.00			1.00	4.10E2	0.52	1.27						
9.00			0.50	2.95E2	0.52	1.37						
9.00	211.47	1.10	0.50	2.95E2	0.52	1.37	1.39	1.18	0.00	294.89	294.89	2.08
10.00			1.00	2.14E2	0.56	1.49						
10.00			0.50	1.63E2	0.56	1.59						
10.00	123.14	0.68	0.50	1.63E2	0.56	1.59	1.32	4.14	0.00	162.63	162.63	0.48
11.00			1.00	3.80E2	0.70	1.39						
11.00			0.50	3.03E2	0.70	1.46						
11.00	241.14	1.70	0.50	3.03E2	0.70	1.46	1.26	2.22	0.00	303.23	303.23	2.08
12.00			1.00	2.23E2	0.49	1.44						
12.00			0.50	1.86E2	0.49	1.51						
12.00	155.05	0.76	0.50	1.86E2	0.49	1.51	1.20	2.92	0.00	186.46	186.46	0.68
13.00			1.00	8.29E1	0.95	1.96						
13.00			0.50	7.27E1	0.95	2.01						
13.00	63.00	0.59	0.50	7.27E1	0.95	2.01	1.15	13.12	0.22	72.72	92.86	0.15
14.00			1.00	1.42E2	0.73	1.71						
14.00			0.50	1.29E2	0.73	1.74						
14.00	115.88	0.84	0.50	1.29E2	0.73	1.74	1.11	6.89	0.05	128.79	135.64	0.31
15.00			1.00	1.75E2	1.16	1.78						
15.00			0.50	1.64E2	1.16	1.80						
15.00	152.55	1.76	0.50	1.64E2	1.16	1.80	1.07	8.07	0.08	163.68	178.27	0.61
16.00			1.00	2.31E2	0.55	1.47						
16.00			0.50	2.23E2	0.55	1.48						
16.00	214.88	1.18	0.50	2.23E2	0.55	1.48	1.04	2.51	0.00	223.09	223.09	1.11
17.00			1.00	1.57E2	0.82	1.71						
17.00			0.50	1.57E2	0.82	1.71						
17.00	155.82	1.27	0.50	1.57E2	0.82	1.71	1.01	6.23	0.03	156.86	162.19	0.48
18.00			1.00	7.13E1	2.12	2.24						
18.00			0.50	7.39E1	2.12	2.23						
18.00	75.58	1.58	0.50	7.39E1	2.12	2.23	0.98	19.85	0.40	73.92	122.51	0.25
19.00			1.00	2.21E2	0.72	1.56						
19.00			0.50	2.33E2	0.72	1.54						
19.00	244.65	1.75	0.50	2.33E2	0.72	1.54	0.95	3.44	0.00	232.90	232.90	1.25
20.00			1.00	1.32E2	0.92	1.79						
20.00			0.50	1.43E2	0.92	1.77						
20.00	154.68	1.41	0.50	1.43E2	0.92	1.77	0.93	7.45	0.07	143.46	153.50	0.42
21.00			1.00	1.09E2	0.50	1.70						
21.00			0.50	1.22E2	0.50	1.66						
21.00	134.33	0.67	0.50	1.22E2	0.50	1.66	0.90	5.43	0.01	121.54	122.95	0.25
22.00			1.00	1.37E2	0.54	1.64						
22.00			0.50	1.56E2	0.54	1.59						
22.00	176.43	0.95	0.50	1.56E2	0.54	1.59	0.88	4.25	0.00	155.94	155.94	0.43
23.00			1.00	1.67E2	0.77	1.67						
23.00			0.50	1.94E2	0.77	1.62						
23.00	225.03	1.72	0.50	1.94E2	0.77	1.62	0.86	4.66	0.00	194.45	194.45	0.76
24.00			1.00	3.58E1	2.05	2.45						
24.00			0.50	4.36E1	2.05	2.39						
24.00	51.51	1.03	0.50	4.36E1	2.05	2.39	0.85	25.87	0.56	43.56	98.41	0.17
25.00			1.00	2.66E1	4.93	2.80						
25.00	40.17	1.91	1.00	2.66E1	4.93	2.80	1.00	NoLiq	1.00	40.17	40.17	2.08
26.00			1.00	9.95E0	3.17	3.01						
26.00	16.51	0.48	1.00	9.95E0	3.17	3.01	1.00	NoLiq	1.00	16.51	16.51	2.08
27.00			1.00	1.22E1	3.58	2.97						
27.00	20.69	0.68	1.00	1.22E1	3.58	2.97	1.00	NoLiq	1.00	20.69	20.69	2.08
28.00			1.00	7.59E0	3.97	3.16						
28.00	13.88	0.49	1.00	7.59E0	3.97	3.16	1.00	NoLiq	1.00	13.88	13.88	2.08
29.00			1.00	7.20E1	3.31	2.37						
29.00			0.50	9.36E1	3.31	2.30						
29.00	120.01	3.92	0.50	9.36E1	3.31	2.30	0.78	22.40	0.46	93.64	174.88	0.58
30.00			1.00	1.36E2	1.23	1.87						
30.00			0.50	1.77E2	1.23	1.79						
30.00	228.36	2.80	0.50	1.77E2	1.23	1.79	0.77	7.98	0.08	176.67	191.92	0.74
31.00			1.00	1.00E2	3.37	2.28						
31.00			0.50	1.32E2	3.37	2.21						
31.00	171.80	5.73	0.50	1.32E2	3.37	2.21	0.77	19.28	0.38	131.76	212.93	0.98
32.00			1.00	1.00E2	2.86	2.23						
32.00			0.50	1.33E2	2.86	2.15						
32.00	174.89	4.96	0.50	1.33E2	2.86	2.15	0.76	17.37	0.33	133.08	198.71	0.81
33.00			1.00	6.74E1	3.94	2.45						
33.00			0.50	9.06E1	3.94	2.36						
33.00	119.97	4.66	0.50	9.06E1	3.94	2.36	0.76	24.95	0.53	90.62	193.92	0.76
34.00			1.00	2.24E1	2.62	2.68						
34.00	41.81	1.04	1.00	2.24E1	2.62	2.68	1.00	NoLiq	1.00	41.81	41.81	2.08
35.00			1.00	1.53E1	1.92	2.74						
35.00	29.60	0.53	1.00	1.53E1	1.92	2.74	1.00	NoLiq	1.00	29.60	29.60	2.08
36.00			1.00	1.46E1	3.40	2.89						
36.00	28.82	0.91	1.00	1.46E1	3.40	2.89	1.00	NoLiq	1.00	28.82	28.82	2.08
37.00			1.00	2.68E1	5.53	2.83						
37.00	51.88	2.75	1.00	2.68E1	5.53	2.83	1.00	NoLiq	1.00	51.88	51.88	2.08
38.00			1.00	1.38E1	3.44	2.92						
38.00	28.16	0.89	1.00	1.38E1	3.44	2.92	1.00	NoLiq	1.00	28.16	28.16	2.08
39.00			1.00	1.70E1	3.72	2.87						
39.00	34.56	1.20	1.00	1.70E1	3.72	2.87	1.00	NoLiq	1.00	34.56	34.56	2.08
40.00			1.00	2.78E1	7.09	2.90						
40.00	55.90	3.80	1.00	2.78E1	7.09	2.90	1.00	NoLiq	1.00	55.90	55.90	2.08

41.00			1.00	4.80E1	5.04	2.63						
41.00	96.02	4.72	1.00	4.80E1	5.04	2.63	1.00	NoLiq	1.00	96.02	96.02	2.08
42.00			1.00	1.26E2	1.64	1.99						
42.00			0.50	1.78E2	1.64	1.88						
42.00	251.06	4.09	0.50	1.78E2	1.64	1.88	0.71	9.99	0.13	178.46	205.92	0.89
43.00			1.00	8.28E1	3.67	2.37						
43.00			0.50	1.19E2	3.67	2.26						
43.00	168.68	6.10	0.50	1.19E2	3.67	2.26	0.71	21.24	0.43	119.06	210.20	0.94
44.00			1.00	2.02E2	0.79	1.61						
44.00			0.50	2.90E2	0.79	1.50						
44.00	413.70	3.24	0.50	2.90E2	0.79	1.50	0.70	2.88	0.00	290.03	290.03	2.08
45.00			1.00	1.66E2	1.00	1.75						
45.00			0.50	2.40E2	1.00	1.64						
45.00	344.30	3.41	0.50	2.40E2	1.00	1.64	0.70	4.95	0.00	239.69	239.69	1.36
46.00			1.00	1.24E2	1.86	2.03						
46.00			0.50	1.81E2	1.86	1.92						
46.00	262.25	4.82	0.50	1.81E2	1.86	1.92	0.69	10.86	0.16	181.34	214.99	1.00
47.00			1.00	5.49E1	2.54	2.37						
47.00			0.50	8.18E1	2.54	2.25						
47.00	119.17	2.96	0.50	8.18E1	2.54	2.25	0.69	20.73	0.42	81.84	141.11	0.34
48.00			1.00	1.38E1	1.72	2.75						
48.00	32.37	0.51	1.00	1.38E1	1.72	2.75	1.00	NoLiq	1.00	32.37	32.37	2.08
49.00			1.00	9.77E0	1.88	2.90						
49.00	23.99	0.40	1.00	9.77E0	1.88	2.90	1.00	NoLiq	1.00	23.99	23.99	2.08
50.00			1.00	1.49E1	4.53	2.97						
50.00	35.46	1.48	1.00	1.49E1	4.53	2.97	1.00	NoLiq	1.00	35.46	35.46	2.08

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 28.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.00	0.88	5.00 ^
1.00	0.04	2.08	1.00	2.08	1.16	2.41	0.88	5.00
2.00	0.08	0.93	1.00	0.93	1.16	1.07	0.88	5.00
3.00	0.11	1.48	1.00	1.48	1.16	1.72	0.88	5.00
4.00	0.15	2.08	1.00	2.08	1.16	2.41	0.88	5.00
5.00	0.18	2.08	1.00	2.08	1.16	2.41	0.87	5.00
6.00	0.22	0.75	1.00	0.75	1.16	0.86	0.87	5.00
7.00	0.26	1.25	1.00	1.25	1.16	1.45	0.87	5.00
8.00	0.30	1.15	1.00	1.15	1.16	1.33	0.87	5.00
9.00	0.33	2.08	1.00	2.08	1.16	2.41	0.87	5.00
10.00	0.37	0.48	1.00	0.48	1.16	0.56	0.86	0.64 *
11.00	0.41	2.08	1.00	2.08	1.16	2.41	0.90	2.67
12.00	0.45	0.68	1.00	0.68	1.16	0.79	0.94	0.84 *
13.00	0.49	0.15	1.00	0.15	1.16	0.18	0.97	0.18 *
14.00	0.53	0.31	1.00	0.31	1.16	0.36	1.00	0.36 *
15.00	0.56	0.61	1.00	0.61	1.16	0.70	1.03	0.68 *
16.00	0.60	1.11	1.00	1.11	1.16	1.29	1.05	1.23
17.00	0.64	0.48	1.00	0.48	1.16	0.55	1.07	0.51 *
18.00	0.68	0.25	1.00	0.25	1.16	0.29	1.09	0.27 *
19.00	0.72	1.25	1.00	1.25	1.16	1.45	1.11	1.31
20.00	0.76	0.42	1.00	0.42	1.16	0.48	1.13	0.43 *
21.00	0.79	0.25	1.00	0.25	1.16	0.29	1.14	0.26 *
22.00	0.83	0.43	1.00	0.43	1.16	0.50	1.16	0.43 *
23.00	0.87	0.76	1.00	0.76	1.16	0.88	1.17	0.76 *
24.00	0.91	0.17	1.00	0.17	1.16	0.20	1.18	0.17 *
25.00	0.94	2.08	1.00	2.08	1.16	2.00	1.20	5.00 ^
26.00	0.98	2.08	1.00	2.08	1.16	2.00	1.21	5.00 ^
27.00	1.02	2.08	1.00	2.09	1.16	2.00	1.22	5.00 ^
28.00	1.05	2.08	1.00	2.08	1.16	2.00	1.23	5.00 ^
29.00	1.07	0.58	1.00	0.57	1.16	0.67	1.24	0.54 *
30.00	1.09	0.74	0.99	0.73	1.16	0.85	1.25	0.68 *
31.00	1.11	0.98	0.99	0.97	1.16	1.12	1.25	0.90 *
32.00	1.12	0.81	0.99	0.80	1.16	0.93	1.25	0.74 *
33.00	1.14	0.76	0.98	0.75	1.16	0.86	1.25	0.69 *
34.00	1.16	2.08	0.98	2.04	1.16	2.00	1.24	5.00 ^
35.00	1.17	2.08	0.98	2.04	1.16	2.00	1.24	5.00 ^
36.00	1.19	2.08	0.98	2.03	1.16	2.00	1.24	5.00 ^
37.00	1.21	2.08	0.97	2.03	1.16	2.00	1.24	5.00 ^
38.00	1.22	2.08	0.97	2.02	1.16	2.00	1.23	5.00 ^
39.00	1.24	2.08	0.97	2.02	1.16	2.00	1.23	5.00 ^
40.00	1.25	2.08	0.97	2.01	1.16	2.00	1.22	5.00 ^
41.00	1.27	2.08	0.96	2.01	1.16	2.00	1.22	5.00 ^
42.00	1.29	0.89	0.96	0.86	1.16	0.99	1.22	0.82 *
43.00	1.30	0.94	0.96	0.91	1.16	1.05	1.21	0.87 *
44.00	1.32	2.08	0.96	1.99	1.16	2.31	1.20	1.92
45.00	1.34	1.36	0.95	1.30	1.16	1.50	1.20	1.26
46.00	1.36	1.00	0.95	0.96	1.16	1.11	1.19	0.93 *
47.00	1.38	0.34	0.95	0.32	1.16	0.38	1.18	0.32 *
48.00	1.39	2.08	0.95	1.97	1.16	2.00	1.17	5.00 ^
49.00	1.41	2.08	0.94	1.97	1.16	2.00	1.17	5.00 ^
50.00	1.43	2.08	0.94	1.96	1.16	2.00	1.16	5.00 ^

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	4.38	1.02	500.00	100.00	NoLiq	0.00	100.00
1.00	1.53	5.67	500.00	88.26	3.33	0.00	88.26
2.00	2.15	4.53	208.68	46.10	17.37	0.00	46.10
3.00	2.41	4.05	247.01	61.03	26.82	0.00	61.03
4.00	2.53	3.82	302.08	79.13	32.23	0.00	79.13
5.00	2.59	3.71	339.86	91.63	35.00	0.00	91.63
6.00	1.88	5.03	192.66	38.33	9.92	0.00	38.33
7.00	1.55	5.63	232.86	41.37	3.63	0.00	41.37
8.00	1.46	5.80	225.80	38.91	2.28	0.00	38.91
9.00	1.37	5.97	294.89	49.42	1.18	0.00	49.42
10.00	1.59	5.57	162.63	29.21	4.14	0.00	29.21
11.00	1.46	5.81	303.23	52.18	2.22	0.00	52.18
12.00	1.51	5.72	186.46	32.61	2.92	0.00	32.61
13.00	2.01	4.79	92.86	19.38	13.12	0.00	19.38
14.00	1.74	5.28	135.64	25.67	6.89	0.00	25.67
15.00	1.80	5.18	178.27	34.42	8.07	0.00	34.42
16.00	1.48	5.77	223.09	38.65	2.51	0.00	38.65
17.00	1.71	5.35	162.19	30.33	6.23	0.00	30.33
18.00	2.23	4.39	122.51	27.92	19.85	0.00	27.92
19.00	1.54	5.65	232.90	41.21	3.44	0.00	41.21
20.00	1.77	5.23	153.50	29.33	7.45	0.00	29.33
21.00	1.66	5.43	122.95	22.65	5.43	0.00	22.65
22.00	1.59	5.56	155.94	28.07	4.25	0.00	28.07
23.00	1.62	5.51	194.45	35.29	4.66	0.00	35.29
24.00	2.39	4.09	98.41	24.06	25.87	0.00	24.06
25.00	2.80	3.33	40.17	12.07	NoLiq	0.00	12.07
26.00	3.01	2.93	16.51	5.63	NoLiq	0.00	5.63
27.00	2.97	3.01	20.69	6.87	NoLiq	0.00	6.87
28.00	3.16	2.65	13.88	5.23	NoLiq	0.00	5.23
29.00	2.30	4.26	174.88	41.09	22.40	0.00	41.09
30.00	1.79	5.19	191.92	37.01	7.98	0.00	37.01
31.00	2.21	4.42	212.93	48.18	19.28	0.00	48.18
32.00	2.15	4.53	198.71	43.90	17.37	0.00	43.90
33.00	2.36	4.13	193.92	46.92	24.95	0.00	46.92
34.00	2.68	3.55	41.81	11.78	NoLiq	0.00	11.78
35.00	2.74	3.44	29.60	8.59	NoLiq	0.00	8.59
36.00	2.89	3.15	28.82	9.15	NoLiq	0.00	9.15
37.00	2.83	3.27	51.88	15.88	NoLiq	0.00	15.88
38.00	2.92	3.11	28.16	9.06	NoLiq	0.00	9.06
39.00	2.87	3.20	34.56	10.80	NoLiq	0.00	10.80
40.00	2.90	3.15	55.90	17.76	NoLiq	0.00	17.76
41.00	2.63	3.65	96.02	26.33	NoLiq	0.00	26.33
42.00	1.88	5.02	205.92	41.02	9.99	0.00	41.02
43.00	2.26	4.32	210.20	48.71	21.24	0.00	48.71
44.00	1.50	5.72	290.03	50.69	2.88	0.00	50.69
45.00	1.64	5.48	239.69	43.75	4.95	0.00	43.75
46.00	1.92	4.95	214.99	43.40	10.86	0.00	43.40
47.00	2.25	4.34	141.11	32.50	20.73	0.00	32.50
48.00	2.75	3.42	32.37	9.46	NoLiq	0.00	9.46
49.00	2.90	3.15	23.99	7.62	NoLiq	0.00	7.62
50.00	2.97	3.02	35.46	11.75	NoLiq	0.00	11.75

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.00	1.16	1.00	1.16	5.00	NoLiq	11.75	54.55	0.000	0.0E0	0.000	0.000
49.00	1.17	1.00	1.17	5.00	NoLiq	7.62	44.46	0.000	0.0E0	0.000	0.000
48.00	1.17	1.00	1.17	5.00	NoLiq	9.46	49.22	0.000	0.0E0	0.000	0.000
47.00	1.18	1.00	1.18	0.32	20.73	32.50	96.01	0.528	3.2E-3	0.006	0.006
46.00	1.19	1.00	1.19	0.93	10.86	43.40	100.00	0.000	0.0E0	0.003	0.010
45.00	1.20	1.00	1.20	1.26	4.95	43.75	100.00	0.000	0.0E0	0.000	0.010
44.00	1.20	1.00	1.20	1.92	2.88	50.69	100.00	0.000	0.0E0	0.000	0.010
43.00	1.21	1.00	1.21	0.87	21.24	48.71	100.00	0.000	0.0E0	0.000	0.010
42.00	1.22	1.00	1.22	0.82	9.99	41.02	100.00	0.000	0.0E0	0.000	0.010
41.00	1.22	1.00	1.22	5.00	NoLiq	26.33	82.31	0.000	0.0E0	0.000	0.010
40.00	1.22	1.00	1.22	5.00	NoLiq	17.76	66.48	0.000	0.0E0	0.000	0.010
39.00	1.23	1.00	1.23	5.00	NoLiq	10.80	52.41	0.000	0.0E0	0.000	0.010
38.00	1.23	1.00	1.23	5.00	NoLiq	9.06	48.22	0.000	0.0E0	0.000	0.010
37.00	1.24	1.00	1.24	5.00	NoLiq	15.88	62.97	0.000	0.0E0	0.000	0.010
36.00	1.24	1.00	1.24	5.00	NoLiq	9.15	48.44	0.000	0.0E0	0.000	0.010
35.00	1.24	1.00	1.24	5.00	NoLiq	8.59	47.04	0.000	0.0E0	0.000	0.010
34.00	1.24	1.00	1.24	5.00	NoLiq	11.78	54.62	0.000	0.0E0	0.000	0.010
33.00	1.25	1.00	1.25	0.69	24.95	46.92	100.00	0.000	0.0E0	0.064	0.074
32.00	1.25	1.00	1.25	0.74	17.37	43.90	100.00	0.000	0.0E0	0.000	0.074
31.00	1.25	1.00	1.25	0.90	19.28	48.18	100.00	0.000	0.0E0	0.000	0.074
30.00	1.25	1.00	1.25	0.68	7.98	37.01	100.00	0.000	0.0E0	0.000	0.074
29.00	1.24	1.00	1.24	0.54	22.40	41.09	100.00	0.000	0.0E0	0.000	0.074

28.00	1.23	1.00	1.23	5.00	NoLiq	5.23	37.49	0.000	0.0E0	0.000	0.074
27.00	1.22	1.00	1.22	5.00	NoLiq	6.87	42.37	0.000	0.0E0	0.000	0.074
26.00	1.21	1.00	1.21	5.00	NoLiq	5.63	38.71	0.000	0.0E0	0.000	0.074
25.00	1.20	1.00	1.20	5.00	NoLiq	12.07	55.27	0.000	0.0E0	0.000	0.074
24.00	1.18	1.00	1.18	0.17	25.87	24.06	77.95	1.838	1.1E-2	0.033	0.107
23.00	1.17	1.00	1.17	0.76	4.66	35.29	100.00	0.000	0.0E0	0.041	0.148
22.00	1.16	1.00	1.16	0.43	4.25	28.07	85.85	1.493	9.0E-3	0.092	0.240
21.00	1.14	1.00	1.14	0.26	5.43	22.65	75.33	1.956	1.2E-2	0.229	0.469
20.00	1.13	1.00	1.13	0.43	7.45	29.33	88.57	1.377	8.3E-3	0.112	0.581
19.00	1.11	1.00	1.11	1.31	3.44	41.21	100.00	0.000	0.0E0	0.048	0.630
18.00	1.09	1.00	1.09	0.27	19.85	27.92	85.54	1.511	9.1E-3	0.092	0.721
17.00	1.07	1.00	1.07	0.51	6.23	30.33	90.80	1.167	7.0E-3	0.188	0.910
16.00	1.05	1.00	1.05	1.23	2.51	38.65	100.00	0.000	0.0E0	0.045	0.954
15.00	1.03	1.00	1.03	0.68	8.07	34.42	100.00	0.000	0.0E0	0.000	0.954
14.00	1.00	1.00	1.00	0.36	6.89	25.67	81.01	1.703	1.0E-2	0.157	1.111
13.00	0.97	1.00	0.97	0.18	13.12	19.38	69.41	2.231	1.3E-2	0.247	1.358
12.00	0.94	1.00	0.94	0.84	2.92	32.61	96.29	0.264	1.6E-3	0.200	1.558
11.00	0.90	1.00	0.90	2.67	2.22	52.18	100.00	0.000	0.0E0	0.000	1.559
10.00	0.86	1.00	0.86	0.64	4.14	29.21	88.29	1.130	6.8E-3	0.079	1.638

Settlement of Saturated Sands=1.638 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm		%		%	in.	in.	in.

Unsaturated Sands from 0-10 feet are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0.0 in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.638 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*

CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

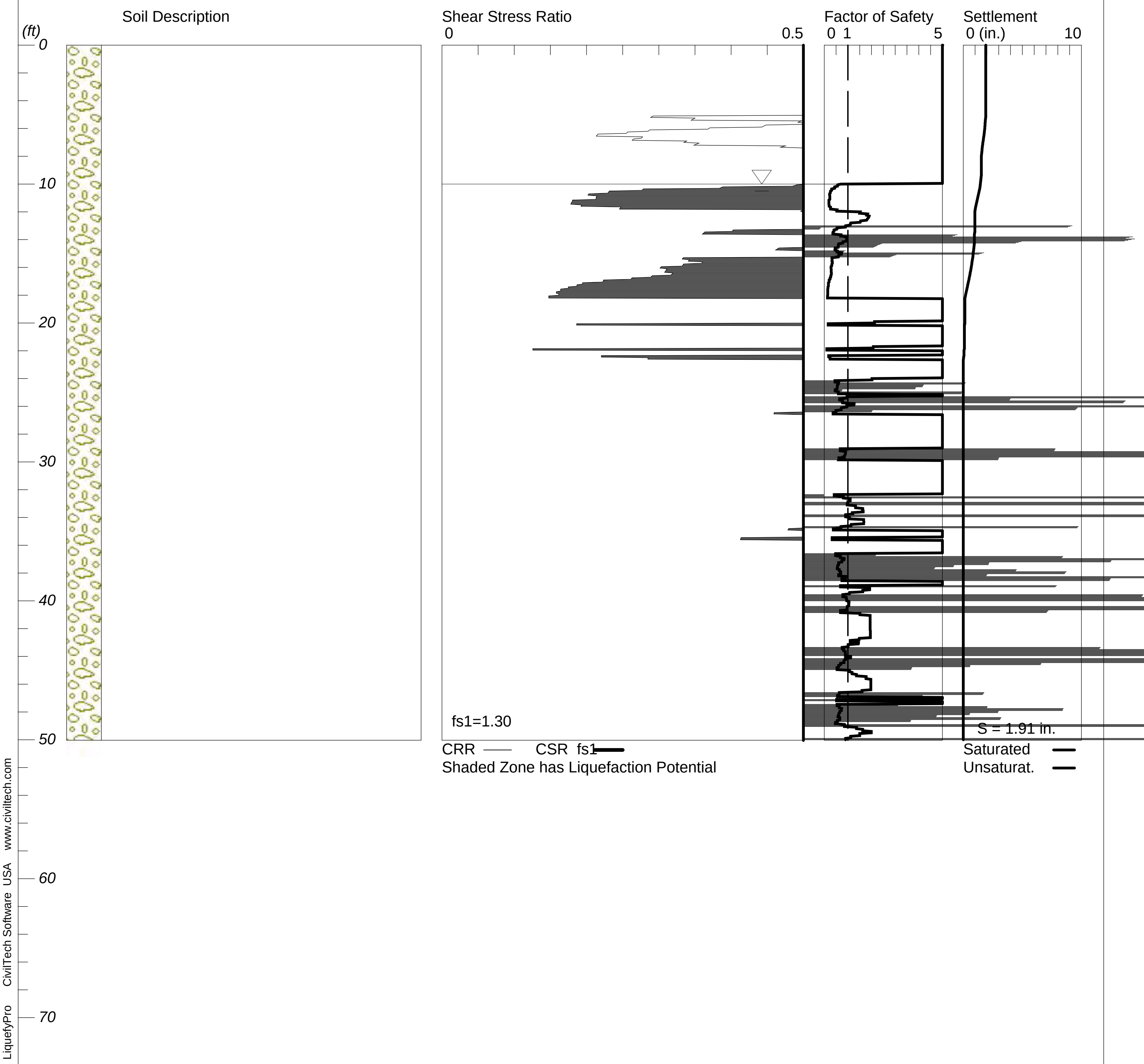
1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS
San Juan School

Hole No.=CPT-7 Water Depth=10 ft

Magnitude=7.08
Acceleration=1.046g



Moore Twining Associates, Inc. E83701.03

Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.
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Input File Name: UNTITLED
Title: San Juan School
Subtitle: E83701.03

Input Data:

Surface Elev.=
Hole No.=CPT-7
Depth of Hole=50.03 ft
Water Table during Earthquake= 10.00 ft
Water Table during In-Situ Testing= 21.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.08
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Average two input data between two Depths: No
* Recommended Options

In-Situ Test Data:

Depth ft	qc atm	fs atm	Rf %	Gamma pcf	Fines %	D50 mm
0.00	6.68	0.00	0.04	120.00	0.00	0.50
0.98	39.16	0.16	0.41	125.00	0.00	0.50
1.97	71.25	0.50	0.71	125.00	0.00	0.50
2.95	53.55	2.80	5.23	120.00	0.00	0.50
3.94	36.90	2.63	7.13	115.00	0.00	0.50
4.92	41.48	0.63	1.51	120.00	0.00	0.50
5.91	33.36	1.02	3.06	115.00	0.00	0.50
6.89	69.09	0.76	1.09	125.00	0.00	0.50
7.87	118.18	0.72	0.61	125.00	0.00	0.50
8.86	115.72	0.75	0.65	125.00	0.00	0.50
9.84	127.85	0.74	0.58	125.00	0.00	0.50
10.83	73.36	0.47	0.64	125.00	0.00	0.50
11.81	124.85	0.93	0.74	125.00	0.00	0.50
12.80	160.81	2.24	1.39	125.00	0.00	0.50
13.78	178.74	0.76	0.42	125.00	0.00	0.50
14.76	150.80	1.01	0.67	125.00	0.00	0.50
15.75	82.33	1.49	1.81	120.00	0.00	0.50
16.73	106.71	0.65	0.61	125.00	0.00	0.50
17.72	38.32	0.63	1.65	120.00	0.00	0.50
18.70	16.41	0.46	2.82	115.00	0.00	0.50
19.69	26.90	0.74	2.74	115.00	0.00	0.50
20.67	20.68	0.32	1.55	115.00	0.00	0.50
21.65	23.76	0.31	1.32	115.00	0.00	0.50
22.64	46.02	1.85	4.03	115.00	0.00	0.50
23.62	30.41	1.99	6.54	115.00	0.00	0.50
24.61	136.76	3.01	2.20	120.00	0.00	0.50
25.59	193.69	3.12	1.61	125.00	0.00	0.50
26.57	46.27	2.18	4.71	115.00	0.00	0.50
27.56	27.29	1.12	4.10	115.00	0.00	0.50
28.54	43.76	2.08	4.74	115.00	0.00	0.50
29.53	128.80	4.74	3.68	120.00	0.00	0.50
30.51	20.22	0.41	2.05	115.00	0.00	0.50
31.50	21.22	0.59	2.80	115.00	0.00	0.50
32.48	188.09	4.09	2.18	120.00	0.00	0.50
33.46	298.60	4.59	1.54	125.00	0.00	0.50
34.45	288.08	2.37	0.82	125.00	0.00	0.50
35.43	85.89	2.43	2.83	120.00	0.00	0.50
36.42	56.10	2.39	4.26	115.00	0.00	0.50
37.40	156.74	3.59	2.29	120.00	0.00	0.50
38.39	130.54	4.63	3.55	120.00	0.00	0.50
39.37	268.77	3.60	1.34	125.00	0.00	0.50
40.35	121.61	5.49	4.51	115.00	0.00	0.50
41.34	414.11	2.94	0.71	125.00	0.00	0.50
42.32	464.87	3.09	0.66	125.00	0.00	0.50
43.31	191.49	4.40	2.30	120.00	0.00	0.50
44.29	198.98	4.75	2.39	120.00	0.00	0.50
45.28	333.94	2.21	0.66	125.00	0.00	0.50
46.26	423.23	2.68	0.63	125.00	0.00	0.50
47.24	86.47	3.83	4.43	115.00	0.00	0.50
48.23	173.63	3.85	2.22	120.00	0.00	0.50
49.21	363.52	3.01	0.83	125.00	0.00	0.50

Modify Robertson method generates Fines from qc/fs. Inputted Fines are not relevant.

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 1.05g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	120.00	0.000	120.00	0.000	1.00	0.000	1.046	0.68	1.30	0.88
1.00	125.00	0.057	125.00	0.057	1.00	0.000	1.046	0.68	1.30	0.88
2.00	125.00	0.116	125.00	0.116	1.00	0.000	1.046	0.68	1.30	0.88
3.00	120.00	0.174	120.00	0.174	0.99	0.000	1.046	0.68	1.30	0.88
4.00	115.00	0.231	115.00	0.231	0.99	0.000	1.046	0.67	1.30	0.88
5.00	120.00	0.286	120.00	0.286	0.99	0.000	1.046	0.67	1.30	0.87
6.00	115.00	0.342	115.00	0.342	0.99	0.000	1.046	0.67	1.30	0.87
7.00	125.00	0.398	125.00	0.398	0.98	0.000	1.046	0.67	1.30	0.87
8.00	125.00	0.457	125.00	0.457	0.98	0.000	1.046	0.67	1.30	0.87
9.00	125.00	0.517	125.00	0.517	0.98	0.000	1.046	0.67	1.30	0.87
10.00	125.00	0.576	62.60	0.576	0.98	0.000	1.046	0.66	1.30	0.86
11.00	125.00	0.635	62.60	0.605	0.97	0.000	1.046	0.69	1.30	0.90
12.00	125.00	0.693	62.60	0.634	0.97	0.000	1.046	0.72	1.30	0.94
13.00	120.00	0.752	57.60	0.664	0.97	0.000	1.046	0.75	1.30	0.97
14.00	125.00	0.810	62.60	0.692	0.97	0.000	1.046	0.77	1.30	1.00
15.00	125.00	0.869	62.60	0.721	0.97	0.000	1.046	0.79	1.30	1.03
16.00	125.00	0.927	62.60	0.750	0.96	0.000	1.046	0.81	1.30	1.05
17.00	125.00	0.986	62.60	0.780	0.96	0.000	1.046	0.83	1.30	1.07
18.00	120.00	1.043	57.60	0.807	0.96	0.000	1.046	0.84	1.30	1.09
19.00	115.00	1.097	52.60	0.832	0.96	0.000	1.046	0.86	1.30	1.11
20.00	120.00	1.152	57.60	0.857	0.95	0.000	1.046	0.87	1.30	1.13
21.00	115.00	1.207	52.60	0.883	0.95	0.000	1.046	0.88	1.30	1.15
22.00	115.00	1.261	52.60	0.907	0.95	0.000	1.046	0.90	1.30	1.17
23.00	115.00	1.316	52.60	0.932	0.95	0.000	1.046	0.91	1.30	1.18
24.00	115.00	1.370	52.60	0.957	0.94	0.000	1.046	0.92	1.30	1.19
25.00	115.00	1.427	52.60	0.985	0.94	0.000	1.046	0.93	1.30	1.21
26.00	125.00	1.484	62.60	1.012	0.94	0.000	1.046	0.94	1.30	1.22
27.00	115.00	1.540	52.60	1.039	0.94	0.000	1.046	0.94	1.30	1.23
28.00	115.00	1.595	52.60	1.064	0.93	0.000	1.046	0.95	1.30	1.24
29.00	115.00	1.649	52.60	1.089	0.93	0.000	1.046	0.96	1.30	1.25
30.00	115.00	1.705	52.60	1.115	0.93	0.000	1.046	0.97	1.30	1.26
31.00	115.00	1.759	52.60	1.140	0.92	0.000	1.046	0.97	1.30	1.26
32.00	115.00	1.814	52.60	1.165	0.91	0.000	1.046	0.97	1.30	1.26
33.00	120.00	1.869	57.60	1.191	0.91	0.000	1.046	0.97	1.30	1.26
34.00	125.00	1.927	62.60	1.220	0.90	0.000	1.046	0.96	1.30	1.25
35.00	115.00	1.986	52.60	1.249	0.89	0.000	1.046	0.96	1.30	1.25
36.00	115.00	2.041	52.60	1.274	0.88	0.000	1.046	0.96	1.30	1.25
37.00	120.00	2.096	57.60	1.300	0.87	0.000	1.046	0.96	1.30	1.24
38.00	125.00	2.152	62.60	1.326	0.86	0.000	1.046	0.95	1.30	1.24
39.00	125.00	2.208	62.60	1.353	0.86	0.000	1.046	0.95	1.30	1.24
40.00	120.00	2.266	57.60	1.382	0.85	0.000	1.046	0.95	1.30	1.23
41.00	125.00	2.323	62.60	1.409	0.84	0.000	1.046	0.94	1.30	1.22
42.00	125.00	2.382	62.60	1.439	0.83	0.000	1.046	0.94	1.30	1.22
43.00	125.00	2.441	62.60	1.468	0.82	0.000	1.046	0.93	1.30	1.21
44.00	125.00	2.500	62.60	1.497	0.82	0.000	1.046	0.93	1.30	1.20
45.00	125.00	2.557	62.60	1.525	0.81	0.000	1.046	0.92	1.30	1.20
46.00	125.00	2.616	62.60	1.554	0.80	0.000	1.046	0.92	1.30	1.19
47.00	115.00	2.674	52.60	1.583	0.79	0.000	1.046	0.91	1.30	1.18
48.00	120.00	2.728	57.60	1.608	0.78	0.000	1.046	0.90	1.30	1.17
49.00	125.00	2.785	62.60	1.635	0.78	0.000	1.046	0.90	1.30	1.17
50.00	125.00	2.844	62.60	1.665	0.77	0.000	1.046	0.89	1.30	1.16

CSR is based on water table at 10.00 during earthquake

CRR Calculation from CPT data, using Modify Robertson's Method:
(Fines content is determined by qc and fric.)

Depth ft	qc atm	fric. atm	n	Q	Rf	Ic	Cq	Fines %	Kc	qc1n atm	qc1f atm	CRR7.5
0.00			1.00	6.68E5	0.04	2.36						
0.00			0.50	2.11E3	0.04	0.24						
0.00	6.68	0.00	0.50	2.11E3	0.04	0.24	316.23	0.00	0.00	500.00	500.00	2.08
1.00			1.00	6.85E2	0.41	1.05						
1.00			0.50	1.64E2	0.41	1.51						
1.00	39.16	0.16	0.50	1.64E2	0.41	1.51	4.19	2.92	0.00	163.92	163.92	0.49
2.00			1.00	6.12E2	0.71	1.27						
2.00			0.50	2.09E2	0.71	1.57						
2.00	71.25	0.50	0.50	2.09E2	0.71	1.57	2.93	3.88	0.00	209.07	209.07	0.93
3.00			1.00	3.06E2	5.25	2.18						
3.00			0.50	1.28E2	5.25	2.37						
3.00	53.55	2.80	0.50	1.28E2	5.25	2.37	2.39	25.21	0.54	128.24	278.56	2.08
4.00			1.00	1.59E2	7.17	2.43						
4.00			0.50	7.68E1	7.17	2.61						
4.00			0.70	1.03E2	7.17	2.54						
4.00	36.90	2.63	0.70	1.03E2	7.17	2.54	2.79	32.33	0.73	102.93	380.68	2.08
5.00			1.00	1.44E2	1.52	1.92						
5.00			0.50	7.75E1	1.52	2.11						
5.00	41.48	0.63	0.50	7.75E1	1.52	2.11	1.87	16.21	0.30	77.53	110.65	0.21
6.00			1.00	9.66E1	3.09	2.26						
6.00			0.50	5.71E1	3.09	2.42						

6.00	33.36	1.02	0.50	5.71E1	3.09	2.42	1.71	27.27	0.59	57.07	140.78	0.34
7.00			1.00	1.72E2	1.10	1.76						
7.00			0.50	1.09E2	1.10	1.91						
7.00	69.09	0.76	0.50	1.09E2	1.10	1.91	1.58	10.58	0.15	109.46	128.61	0.28
8.00			1.00	2.57E2	0.61	1.46						
8.00			0.50	1.75E2	0.61	1.59						
8.00	118.18	0.72	0.50	1.75E2	0.61	1.59	1.48	4.15	0.00	174.73	174.73	0.58
9.00			1.00	2.23E2	0.65	1.52						
9.00			0.50	1.61E2	0.65	1.63						
9.00	115.72	0.75	0.50	1.61E2	0.65	1.63	1.39	4.88	0.00	161.02	161.02	0.47
10.00			1.00	2.21E2	0.58	1.50						
10.00			0.50	1.69E2	0.58	1.59						
10.00	127.85	0.74	0.50	1.69E2	0.58	1.59	1.32	4.13	0.00	168.52	168.52	0.53
11.00			1.00	1.16E2	0.62	1.73						
11.00			0.50	9.36E1	0.62	1.81						
11.00	74.56	0.45	0.50	9.36E1	0.62	1.81	1.26	8.27	0.09	93.59	102.54	0.18
12.00			1.00	2.77E2	0.54	1.40						
12.00			0.50	2.32E2	0.54	1.46						
12.00	192.89	1.04	0.50	2.32E2	0.54	1.46	1.20	2.29	0.00	231.65	231.65	1.24
13.00			1.00	1.64E2	2.16	2.00						
13.00			0.50	1.44E2	2.16	2.03						
13.00	124.51	2.67	0.50	1.44E2	2.16	2.03	1.15	13.89	0.24	143.54	188.23	0.70
14.00			1.00	2.21E2	0.46	1.43						
14.00			0.50	2.00E2	0.46	1.47						
14.00	179.92	0.83	0.50	2.00E2	0.46	1.47	1.11	2.38	0.00	199.95	199.95	0.82
15.00			1.00	1.95E2	0.31	1.38						
15.00			0.50	1.82E2	0.31	1.40						
15.00	170.03	0.53	0.50	1.82E2	0.31	1.40	1.07	1.57	0.00	182.42	182.42	0.64
16.00			1.00	1.00E2	1.27	1.98						
16.00			0.50	9.72E1	1.27	1.99						
16.00	93.59	1.18	0.50	9.72E1	1.27	1.99	1.04	12.63	0.20	97.20	122.07	0.25
17.00			1.00	9.05E1	0.79	1.88						
17.00			0.50	9.09E1	0.79	1.88						
17.00	90.27	0.71	0.50	9.09E1	0.79	1.88	1.01	9.94	0.13	90.90	104.72	0.19
18.00			1.00	3.21E1	1.92	2.47						
18.00			0.50	3.38E1	1.92	2.45						
18.00	34.52	0.64	0.50	3.38E1	1.92	2.45	0.98	28.69	0.63	33.80	92.00	0.15
19.00			1.00	1.29E1	3.23	2.92						
19.00	15.28	0.46	1.00	1.29E1	3.23	2.92	1.00	NoLiq	1.00	15.28	15.28	2.08
20.00			1.00	4.43E1	2.08	2.39						
20.00			0.50	4.86E1	2.08	2.35						
20.00	52.18	1.06	0.50	4.86E1	2.08	2.35	0.93	24.60	0.52	48.61	101.98	0.18
21.00			1.00	1.67E1	1.40	2.63						
21.00	21.36	0.28	1.00	1.67E1	1.40	2.63	1.00	NoLiq	1.00	21.36	21.36	2.08
22.00			1.00	2.16E1	1.91	2.61						
22.00	27.84	0.51	1.00	2.16E1	1.91	2.61	1.00	NoLiq	1.00	27.84	27.84	2.08
23.00			1.00	2.84E1	5.02	2.79						
23.00	37.05	1.80	1.00	2.84E1	5.02	2.79	1.00	NoLiq	1.00	37.05	37.05	2.08
24.00			1.00	5.14E1	3.48	2.49						
24.00			0.50	5.95E1	3.48	2.44						
24.00	67.35	2.29	0.50	5.95E1	3.48	2.44	0.88	28.28	0.62	59.46	157.18	0.44
25.00			1.00	6.02E1	4.21	2.50						
25.00			0.50	7.02E1	4.21	2.46						
25.00	80.33	3.32	0.50	7.02E1	4.21	2.46	0.87	28.82	0.64	70.17	192.76	0.75
26.00			1.00	1.72E2	1.20	1.79						
26.00			0.50	2.00E2	1.20	1.75						
26.00	231.67	2.77	0.50	2.00E2	1.20	1.75	0.86	7.06	0.05	200.27	211.90	0.96
27.00			1.00	2.44E1	5.42	2.85						
27.00	34.91	1.81	1.00	2.44E1	5.42	2.85	1.00	NoLiq	1.00	34.91	34.91	2.08
28.00			1.00	1.95E1	3.43	2.80						
28.00	28.67	0.93	1.00	1.95E1	3.43	2.80	1.00	NoLiq	1.00	28.67	28.67	2.08
29.00			1.00	3.56E1	6.47	2.79						
29.00	52.03	3.26	1.00	3.56E1	6.47	2.79	1.00	NoLiq	1.00	52.03	52.03	2.08
30.00			1.00	3.92E1	4.20	2.63						
30.00	58.19	2.37	1.00	3.92E1	4.20	2.63	1.00	NoLiq	1.00	58.19	58.19	2.08
31.00			1.00	1.17E1	2.33	2.88						
31.00	18.86	0.40	1.00	1.17E1	2.33	2.88	1.00	NoLiq	1.00	18.86	18.86	2.08
32.00			1.00	1.51E1	8.17	3.13						
32.00	24.30	1.84	1.00	1.51E1	8.17	3.13	1.00	NoLiq	1.00	24.30	24.30	2.08
33.00			1.00	1.08E2	3.16	2.24						
33.00			0.50	1.35E2	3.16	2.18						
33.00	166.31	5.19	0.50	1.35E2	3.16	2.18	0.81	18.32	0.36	135.03	209.54	0.94
34.00			1.00	1.45E2	2.03	2.01						
34.00			0.50	1.82E2	2.03	1.95						
34.00	226.56	4.56	0.50	1.82E2	2.03	1.95	0.80	11.59	0.18	182.25	221.14	1.09
35.00			1.00	3.90E1	4.08	2.62						
35.00	63.35	2.51	1.00	3.90E1	4.08	2.62	1.00	NoLiq	1.00	63.35	63.35	2.08
36.00			1.00	2.89E1	4.75	2.76						
36.00	48.25	2.19	1.00	2.89E1	4.75	2.76	1.00	NoLiq	1.00	48.25	48.25	2.08
37.00			1.00	8.30E1	3.67	2.36						
37.00			0.50	1.08E2	3.67	2.29						
37.00	137.07	4.95	0.50	1.08E2	3.67	2.29	0.78	22.23	0.46	107.51	199.14	0.81
38.00			1.00	1.17E2	1.88	2.05						
38.00			0.50	1.53E2	1.88	1.97						
38.00	196.13	3.65	0.50	1.53E2	1.88	1.97	0.78	12.19	0.19	152.59	188.87	0.71
39.00			1.00	1.29E2	1.38	1.92						
39.00			0.50	1.69E2	1.38	1.84						
39.00	218.58	2.98	0.50	1.69E2	1.38	1.84	0.77	9.04	0.11	168.68	189.08	0.71
40.00			1.00	8.39E1	3.84	2.38						
40.00			0.50	1.11E2	3.84	2.30						
40.00	145.49	5.50	0.50	1.11E2	3.84	2.30	0.77	22.46	0.47	111.33	208.59	0.92
41.00			1.00	1.92E2	0.71	1.60						
41.00			0.50	2.55E2	0.71	1.51						
41.00	335.63	2.36	0.50	2.55E2	0.71	1.51	0.76	2.96	0.00	254.82	254.82	1.62
42.00			1.00	2.61E2	0.84	1.56						
42.00			0.50	3.48E2	0.84	1.47						
42.00	462.74	3.88	0.50	3.48E2	0.84	1.47	0.75	2.48	0.00	348.36	348.36	2.08

43.00			1.00	1.77E2	1.28	1.80						
43.00			0.50	2.39E2	1.28	1.72						
43.00	319.75	4.05	0.50	2.39E2	1.28	1.72	0.75	6.46	0.04	238.72	248.38	1.51
44.00			1.00	1.68E2	0.61	1.60						
44.00			0.50	2.28E2	0.61	1.50						
44.00	308.42	1.86	0.50	2.28E2	0.61	1.50	0.74	2.79	0.00	228.43	228.43	1.19
45.00			1.00	1.64E2	0.75	1.66						
45.00			0.50	2.25E2	0.75	1.56						
45.00	305.97	2.26	0.50	2.25E2	0.75	1.56	0.74	3.77	0.00	224.92	224.92	1.14
46.00			1.00	2.17E2	0.62	1.52						
46.00			0.50	2.99E2	0.62	1.42						
46.00	409.92	2.51	0.50	2.99E2	0.62	1.42	0.73	1.73	0.00	298.96	298.96	2.08
47.00			1.00	4.27E1	4.77	2.64						
47.00	84.22	3.89	1.00	4.27E1	4.77	2.64	1.00	NoLiq	1.00	84.22	84.22	2.08
48.00			1.00	8.89E1	2.48	2.22						
48.00			0.50	1.26E2	2.48	2.12						
48.00	174.62	4.26	0.50	1.26E2	2.48	2.12	0.72	16.36	0.30	125.57	180.22	0.62
49.00			1.00	1.42E2	0.96	1.78						
49.00			0.50	2.01E2	0.96	1.68						
49.00	281.87	2.69	0.50	2.01E2	0.96	1.68	0.71	5.68	0.02	201.28	204.99	0.88
50.00			1.00	1.47E2	0.52	1.60						
50.00			0.50	2.09E2	0.52	1.48						
50.00	295.44	1.52	0.50	2.09E2	0.52	1.48	0.71	2.59	0.00	209.39	209.39	0.93

Fines have been calculated, and correction is made by Modify Robertson Method.
Fines=NoLiq means the soils are not liquefiable.
CRR is based on water table at 21.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.08:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.08	1.00	2.08	1.16	2.41	0.88	5.00
1.00	0.04	0.49	1.00	0.49	1.16	0.57	0.88	5.00
2.00	0.08	0.93	1.00	0.93	1.16	1.08	0.88	5.00
3.00	0.11	2.08	1.00	2.08	1.16	2.41	0.88	5.00
4.00	0.15	2.08	1.00	2.08	1.16	2.41	0.88	5.00
5.00	0.19	0.21	1.00	0.21	1.16	0.24	0.87	5.00
6.00	0.22	0.34	1.00	0.34	1.16	0.39	0.87	5.00
7.00	0.26	0.28	1.00	0.28	1.16	0.32	0.87	5.00
8.00	0.30	0.58	1.00	0.58	1.16	0.67	0.87	5.00
9.00	0.34	0.47	1.00	0.47	1.16	0.54	0.87	5.00
10.00	0.37	0.53	1.00	0.53	1.16	0.61	0.86	0.70 *
11.00	0.41	0.18	1.00	0.18	1.16	0.21	0.90	0.23 *
12.00	0.45	1.24	1.00	1.24	1.16	1.43	0.94	1.53
13.00	0.49	0.70	1.00	0.70	1.16	0.81	0.97	0.84 *
14.00	0.53	0.82	1.00	0.82	1.16	0.95	1.00	0.95 *
15.00	0.56	0.64	1.00	0.64	1.16	0.75	1.03	0.73 *
16.00	0.60	0.25	1.00	0.25	1.16	0.29	1.05	0.27 *
17.00	0.64	0.19	1.00	0.19	1.16	0.22	1.07	0.20 *
18.00	0.68	0.15	1.00	0.15	1.16	0.18	1.09	0.16 *
19.00	0.71	2.08	1.00	2.08	1.16	2.00	1.11	5.00 ^
20.00	0.75	0.18	1.00	0.18	1.16	0.21	1.13	0.18 *
21.00	0.78	2.08	1.00	2.08	1.16	2.00	1.15	5.00 ^
22.00	0.80	2.08	1.00	2.08	1.16	2.00	1.17	5.00 ^
23.00	0.82	2.08	1.00	2.08	1.16	2.00	1.18	5.00 ^
24.00	0.83	0.44	1.00	0.44	1.16	0.51	1.19	0.43 *
25.00	0.85	0.75	1.00	0.75	1.16	0.86	1.21	0.72 *
26.00	0.87	0.96	1.00	0.96	1.16	1.12	1.22	0.92 *
27.00	0.89	2.08	1.00	2.08	1.16	2.00	1.23	5.00 ^
28.00	0.90	2.08	1.00	2.08	1.16	2.00	1.24	5.00 ^
29.00	0.92	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
30.00	0.94	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
31.00	0.95	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
32.00	0.97	2.08	1.00	2.08	1.16	2.00	1.26	5.00 ^
33.00	0.99	0.94	1.00	0.94	1.16	1.08	1.26	0.86 *
34.00	1.00	1.09	1.01	1.09	1.16	1.26	1.25	1.01
35.00	1.02	2.08	1.00	2.09	1.16	2.00	1.25	5.00 ^
36.00	1.04	2.08	1.00	2.08	1.16	2.00	1.25	5.00 ^
37.00	1.06	0.81	1.00	0.81	1.16	0.94	1.24	0.76 *
38.00	1.07	0.71	0.99	0.70	1.16	0.81	1.24	0.66 *
39.00	1.09	0.71	0.99	0.70	1.16	0.81	1.24	0.66 *
40.00	1.11	0.92	0.99	0.91	1.16	1.06	1.23	0.86 *
41.00	1.13	1.62	0.99	1.60	1.16	1.85	1.22	1.51
42.00	1.15	2.08	0.98	2.05	1.16	2.37	1.22	1.95
43.00	1.17	1.51	0.98	1.48	1.16	1.71	1.21	1.41
44.00	1.18	1.19	0.98	1.16	1.16	1.35	1.20	1.12
45.00	1.20	1.14	0.97	1.11	1.16	1.29	1.20	1.07
46.00	1.22	2.08	0.97	2.02	1.16	2.34	1.19	1.97
47.00	1.24	2.08	0.97	2.02	1.16	2.00	1.18	5.00 ^
48.00	1.26	0.62	0.97	0.60	1.16	0.70	1.17	0.60 *
49.00	1.27	0.88	0.96	0.85	1.16	0.98	1.17	0.84 *
50.00	1.29	0.93	0.96	0.90	1.16	1.04	1.16	0.90 *

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	0.24	8.00	500.00	62.49	0.00	0.00	62.49
1.00	1.51	5.72	163.92	28.67	2.92	0.00	28.67
2.00	1.57	5.60	209.07	37.34	3.88	0.00	37.34
3.00	2.37	4.12	278.56	67.60	25.21	0.00	67.60
4.00	2.54	3.81	380.68	99.82	32.33	0.00	99.82
5.00	2.11	4.60	110.65	24.08	16.21	0.00	24.08
6.00	2.42	4.03	140.78	34.96	27.27	0.00	34.96
7.00	1.91	4.98	128.61	25.85	10.58	0.00	25.85
8.00	1.59	5.57	174.73	31.38	4.15	0.00	31.38
9.00	1.63	5.49	161.02	29.35	4.88	0.00	29.35
10.00	1.59	5.57	168.52	30.26	4.13	0.00	30.26
11.00	1.81	5.16	102.54	19.87	8.27	0.00	19.87
12.00	1.46	5.80	231.65	39.92	2.29	0.00	39.92
13.00	2.03	4.74	188.23	39.70	13.89	0.00	39.70
14.00	1.47	5.79	199.95	34.54	2.38	0.00	34.54
15.00	1.40	5.91	182.42	30.89	1.57	0.00	30.89
16.00	1.99	4.83	122.07	25.29	12.63	0.00	25.29
17.00	1.88	5.02	104.72	20.84	9.94	0.00	20.84
18.00	2.45	3.96	92.00	23.21	28.69	0.00	23.21
19.00	2.92	3.10	15.28	4.93	NoLiq	0.00	4.93
20.00	2.35	4.15	101.98	24.58	24.60	0.00	24.58
21.00	2.63	3.64	21.36	5.87	NoLiq	0.00	5.87
22.00	2.61	3.67	27.84	7.58	NoLiq	0.00	7.58
23.00	2.79	3.35	37.05	11.05	NoLiq	0.00	11.05
24.00	2.44	3.98	157.18	39.47	28.28	0.00	39.47
25.00	2.46	3.96	192.76	48.69	28.82	0.00	48.69
26.00	1.75	5.27	211.90	40.21	7.06	0.00	40.21
27.00	2.85	3.22	34.91	10.83	NoLiq	0.00	10.83
28.00	2.80	3.33	28.67	8.62	NoLiq	0.00	8.62
29.00	2.79	3.34	52.03	15.59	NoLiq	0.00	15.59
30.00	2.63	3.64	58.19	15.99	NoLiq	0.00	15.99
31.00	2.88	3.18	18.86	5.93	NoLiq	0.00	5.93
32.00	3.13	2.72	24.30	8.95	NoLiq	0.00	8.95
33.00	2.18	4.47	209.54	46.85	18.32	0.00	46.85
34.00	1.95	4.90	221.14	45.13	11.59	0.00	45.13
35.00	2.62	3.65	63.35	17.35	NoLiq	0.00	17.35
36.00	2.76	3.39	48.25	14.22	NoLiq	0.00	14.22
37.00	2.29	4.26	199.14	46.70	22.23	0.00	46.70
38.00	1.97	4.86	188.87	38.89	12.19	0.00	38.89
39.00	1.84	5.10	189.08	37.10	9.04	0.00	37.10
40.00	2.30	4.25	208.59	49.05	22.46	0.00	49.05
41.00	1.51	5.71	254.82	44.61	2.96	0.00	44.61
42.00	1.47	5.78	348.36	60.32	2.48	0.00	60.32
43.00	1.72	5.33	248.38	46.64	6.46	0.00	46.64
44.00	1.50	5.73	228.43	39.84	2.79	0.00	39.84
45.00	1.56	5.61	224.92	40.08	3.77	0.00	40.08
46.00	1.42	5.88	298.96	50.82	1.73	0.00	50.82
47.00	2.64	3.62	84.22	23.30	NoLiq	0.00	23.30
48.00	2.12	4.59	180.22	39.29	16.36	0.00	39.29
49.00	1.68	5.40	204.99	37.94	5.68	0.00	37.94
50.00	1.48	5.76	209.39	36.34	2.59	0.00	36.34

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
(N1)60 is converted from qc1, (N1)60s is after fines correction
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.00	1.16	1.00	1.16	0.90	2.59	36.34	100.00	0.000	0.0E0	0.000	0.000
49.00	1.17	1.00	1.17	0.84	5.68	37.94	100.00	0.000	0.0E0	0.000	0.000
48.00	1.17	1.00	1.17	0.60	16.36	39.29	100.00	0.000	0.0E0	0.001	0.001
47.00	1.18	1.00	1.18	5.00	NoLiq	23.30	76.52	0.000	0.0E0	0.000	0.001
46.00	1.19	1.00	1.19	1.97	1.73	50.82	100.00	0.000	0.0E0	0.000	0.001
45.00	1.20	1.00	1.20	1.07	3.77	40.08	100.00	0.000	0.0E0	0.000	0.001
44.00	1.20	1.00	1.20	1.12	2.79	39.84	100.00	0.000	0.0E0	0.000	0.001
43.00	1.21	1.00	1.21	1.41	6.46	46.64	100.00	0.000	0.0E0	0.000	0.001
42.00	1.22	1.00	1.22	1.95	2.48	60.32	100.00	0.000	0.0E0	0.000	0.001
41.00	1.22	1.00	1.22	1.51	2.96	44.61	100.00	0.000	0.0E0	0.000	0.001
40.00	1.23	1.00	1.23	0.86	22.46	49.05	100.00	0.000	0.0E0	0.000	0.001
39.00	1.24	1.00	1.24	0.66	9.04	37.10	100.00	0.000	0.0E0	0.000	0.001
38.00	1.24	1.00	1.24	0.66	12.19	38.89	100.00	0.000	0.0E0	0.000	0.001
37.00	1.24	1.00	1.24	0.76	22.23	46.70	100.00	0.000	0.0E0	0.000	0.001
36.00	1.25	1.00	1.25	5.00	NoLiq	14.22	59.73	0.000	0.0E0	0.000	0.001
35.00	1.25	1.00	1.25	5.00	NoLiq	17.35	65.72	0.000	0.0E0	0.002	0.003
34.00	1.25	1.00	1.25	1.01	11.59	45.13	100.00	0.000	0.0E0	0.006	0.009
33.00	1.26	1.00	1.26	0.86	18.32	46.85	100.00	0.000	0.0E0	0.000	0.009
32.00	1.26	1.00	1.26	5.00	NoLiq	8.95	47.94	0.000	0.0E0	0.000	0.009
31.00	1.26	1.00	1.26	5.00	NoLiq	5.93	39.64	0.000	0.0E0	0.000	0.009
30.00	1.26	1.00	1.26	5.00	NoLiq	15.99	63.18	0.000	0.0E0	0.000	0.009

29.00	1.25	1.00	1.25	5.00	NoLiq	15.59	62.42	0.000	0.0E0	0.000	0.009
28.00	1.24	1.00	1.24	5.00	NoLiq	8.62	47.10	0.000	0.0E0	0.000	0.009
27.00	1.23	1.00	1.23	5.00	NoLiq	10.83	52.48	0.000	0.0E0	0.000	0.009
26.00	1.22	1.00	1.22	0.92	7.06	40.21	100.00	0.000	0.0E0	0.000	0.009
25.00	1.21	1.00	1.21	0.72	28.82	48.69	100.00	0.000	0.0E0	0.000	0.009
24.00	1.19	1.00	1.19	0.43	28.28	39.47	100.00	0.000	0.0E0	0.010	0.018
23.00	1.18	1.00	1.18	5.00	NoLiq	11.05	52.99	0.000	0.0E0	0.000	0.018
22.00	1.17	1.00	1.17	5.00	NoLiq	7.58	44.34	0.000	0.0E0	0.014	0.032
21.00	1.15	1.00	1.15	5.00	NoLiq	5.87	39.44	0.000	0.0E0	0.076	0.108
20.00	1.13	1.00	1.13	0.18	24.60	24.58	78.92	1.795	1.1E-2	0.044	0.152
19.00	1.11	1.00	1.11	5.00	NoLiq	4.93	36.55	0.000	0.0E0	0.022	0.174
18.00	1.09	1.00	1.09	0.16	28.69	23.21	76.36	1.910	1.1E-2	0.057	0.231
17.00	1.07	1.00	1.07	0.20	9.94	20.84	72.06	2.103	1.3E-2	0.255	0.486
16.00	1.05	1.00	1.05	0.27	12.63	25.29	80.28	1.734	1.0E-2	0.231	0.717
15.00	1.03	1.00	1.03	0.73	1.57	30.89	92.10	0.713	4.3E-3	0.170	0.887
14.00	1.00	1.00	1.00	0.95	2.38	34.54	100.00	0.000	0.0E0	0.095	0.982
13.00	0.97	1.00	0.97	0.84	13.89	39.70	100.00	0.000	0.0E0	0.046	1.028
12.00	0.94	1.00	0.94	1.53	2.29	39.92	100.00	0.000	0.0E0	0.000	1.028
11.00	0.90	1.00	0.90	0.23	8.27	19.87	70.30	2.182	1.3E-2	0.245	1.274
10.00	0.86	1.00	0.86	0.70	4.13	30.26	90.64	0.883	5.3E-3	0.230	1.503

Settlement of Saturated Sands=1.503 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth ft	sigma' atm	sigC' atm	(N1)60s	CSRsf	Gmax atm	g*Ge/Gm	g_eff	ec7.5 %	Cec	ec %	dsz in.	dsp in.	S in.
7.00	0.40	0.26	25.85	0.87	672.15	5.2E-4	1.0000	0.7032	0.95	0.6688	8.03E-3	0.133	0.133
6.00	0.34	0.22	34.96	0.87	688.31	4.3E-4	1.0000	0.4367	0.95	0.4153	4.98E-3	0.160	0.293
5.00	0.29	0.19	24.08	0.87	556.46	4.5E-4	1.0000	0.7730	0.95	0.7351	8.82E-3	0.109	0.402

Unsaturated Sands from 0-5 feet and 8-10 are not considered subject to dry seismic settlement due to qc1f values being above 160 atm.

Settlement of Unsaturated Sands=0.402 in.
(N1)60s is converted from qc1 and after fines correction
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.905 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRfs
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT

qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

APPENDIX E

SURFACE-FAULT RUPTURE HAZARD INVESTIGATION

Proposed Project Site

Fault Rupture Hazard Assessment for Seismic Rehabilitation and Multi-Purpose Building

Final Report | San Juan School, San Juan Bautista, California

04.00219222-PR-001 02 | August 29, 2022

Final Report

Moore Twining Associates, Inc.

Document Control

Document Information

Project Title	Fault Rupture Hazard Update for San Juan School
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Client Information

Client	Moore Twining Associates, Inc.
Client Address	2527 Fresno Street, Fresno, CA 93721 2527 Fresno Street, Fresno, California 93721
Client Contact	Read Andersen

Revision History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Approved By
01	Aug. 24, 2022	Draft	For client review	JS, JG	DW	JS
01	Aug. 29, 2022	Final	For use	JS, JG	DW	JS

Project Team

Initials	Name	Role
JS	Janet Sowers	Project Manager and Technical Lead
DW	Donald Wells	Technical Reviewer
JG	Josh Goodman	Project Geologist (formerly with Fugro)
WG	Bill Godwin	Engineering Geologist (formerly with Fugro)

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August 29, 2022

Dear Mr. Andersen,

Fugro is pleased to present this updated fault rupture hazard report for San Juan School in San Juan Bautista, California. The purpose of this study is to assess the potential presence of active traces of the San Andreas near or through the school campus that may affect the seismic rehabilitation of buildings A through E and G, and the siting and design of a new multi-purpose building. The report builds on and updates the fault rupture hazard study Fugro conducted for the school in 2012 and incorporates the results of a fault rupture hazard evaluation conducted by Fugro for two relocatable classrooms in 2020.

The fault rupture hazard evaluation is required because San Juan School is located within a State of California Earthquake Fault Zone (EFZ) associated with the San Andreas fault, and because the California Code of Regulations (CCR) Title 14 and the. California Administrative Code (CCR Title 24 Part 1 Section 4-317e) specify that for building sites within an EFZ, investigations must be performed to show that new school buildings will not be constructed within 50 feet of the trace of an active fault.

We understand that this report will be appended to an updated geologic hazard report in preparation by Moore Twining Associates, Inc.

We have enjoyed working with you on this interesting project. Please do not hesitate to contact us if you have questions or need further assistance.

Sincerely,

REGISTERED GEOLOGIST
JANET M. SOWERS
No. 5614
Exp. 4/30/2023
STATE OF CALIFORNIA

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1. Introduction

Fugro USA Land, Inc. (Fugro) conducted a surface-fault rupture hazard investigation at San Juan School (site), located at 100 Nyland Drive in San Juan Bautista, San Benito County, California. The Aromas-San Juan Unified School District is planning seismic upgrades to six existing buildings and construction of a new multi-use building in the existing play court area (Figure 1).

The site falls within a state-designated Fault Rupture Hazard Zone (Bryant and Hart, 2007); some existing buildings appear to be located as close as 150 feet rom the mapped trace of the San Andreas fault zone. Because of the proximity of the site to the fault, the proposed site improvements are subject to the California Administrative Code CCR Title 1 Part 1, which states that no new school buildings shall be constructed, rehabilitated, or relocated within 50 feet of the trace of an active fault. A fault is considered active if there is evidence of fault-related deformation (e.g., discrete offset, fracturing, and/or folding) younger than ~11,000 years old (Bryant and Hart, 2007; California Geological Survey, 2002). The purpose of this investigation was to assess the presence or absence of active faulting beneath the site and evaluate the potential hazard posed by future surface-fault rupture associated with the San Andreas fault.

The proposed project consists of seismic upgrades to buildings A through E and G, and construction of a new multi-purpose building. A geohazard report is required for this project per the requirements of the CAC and the Division of the State Architect (DSA) (IR A.4-13, rev 10-11-2016). This fault rupture hazard report will be incorporated into the larger geohazard report prepared by Moore Twining Associates, Inc. (MTA).

In 2012 Fugro worked with MTA at the San Juan School site to conduct a fault rupture hazard investigation in preparation for seismic upgrades to several buildings and construction of a multiuse building on the campus. For that study, we conducted literature review and collaborated with MTA to log and interpret two fault trenches. Fugro prepared and submitted a report, "Surface-Fault Rupture Hazard Investigation, San Juan School Site" dated December 13, 2012, which was included in MTA's comprehensive 2012 report.

In 2020 Fugro updated the 2012 fault rupture hazard study for San Juan School with focus on the proposed site of two relocatable classrooms. This work resulted in detailed mapping of the main trace of the San Andreas fault adjacent to the campus to establish its distance more precisely.

This report is an update of our 2012 report and incorporates new fault mapping conducted by Fugro in 2020.

Figure 1: Aerial View of the Project Site

Area of proposed project showing the trace of the San Andreas fault as mapped by the USGS and CGS, Quaternary Fault and Fold Database. Base imagery from Google Earth.

1.1 Scope of Work

The scope of work included the following tasks:

- Review site geomorphology and geology using available stereo aerial photographs, digital elevation maps, geologic maps, and published and unpublished reports and technical data
- Review the project work plan prepared by Moore Twining.
- Document and interpret two exploratory trenches
- Conduct soil profile analyses of trench exposures
- Participate in a trench review with the California Geological Survey (CGS)
- Map the trace of the San Andreas fault adjacent to the school property
- Prepare a Fault-Rupture Hazard Investigation report, to be included as an appendix in Moore Twining Associates, Inc.'s geotechnical and geologic/seismic hazard investigation report.

Two exploratory trenches, Trench A and Trench B, were excavated, totaling approximately 477 feet in length. Trench logging was conducted by Fugro and Moore Twining Associates, Inc. from

November 06 through November 08, 2012, and on November 12, 2012. A field visit was conducted on November 13, 2012, to conduct soil profile analysis and participate in a field review of the trench exposures with representatives of the CGS.

1.2 Approach

The field fault investigation and evaluation of surface fault rupture hazard were conducted according with guidance provided by the CGS Note 48 "Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings (dated January 01, 2011)", and Note 49, "Guidelines for Evaluating the Hazard of Surface Fault Rupture", which recommend methodologies for assessing seismic hazards in California. In accordance with these documents, exploratory trenching was used to evaluate the presence or absence of active faults beneath the site. The decision to use trenching as an investigative technique and the choice of trench layout were both based on the success and results of previous trenching efforts adjacent to the San Juan School campus (Cleary Consultants, 1987; D&M Consulting Engineers, Inc, 2002).

Our trench investigation extended to a maximum depth of approximately ten feet below adjacent ground surface. Age estimates of the deposits exposed in the trenches were based on an assessment of soil profile development in sediments exposed in the trench walls.

1.3 Report Organization

Following this introduction, Section 2.0 presents results from Fugro's review of the geomorphology and geology of the site. Data reviewed for this task included stereo air photos, LiDAR-based digital elevation data, published geologic maps and literature, and previous consultant's reports from studies done adjacent to the school campus. Section 3 describes field reconnaissance mapping of the San Andreas fault adjacent to the campus. Section 4.0 presents the results of the trenching investigation, with particular attention given to the geologic relations that address the presence or absence of faulting, as well as soil profile analysis and estimates on the age of the geologic units exposed in the trenches. Section 5.0 provides a discussion of the field data and analysis with respect to the presence or absence of faulting across the site. Section 6.0 summarizes the findings and conclusions of this study.

1.4 Project Team and Acknowledgements

The field investigations summarized in this report were completed in November 2012, by Fugro geologists Joshua Goodman (PG) and Dr. Janet Sowers (PG). Moore Twining Associates, Inc. geologists and engineers involved in the field investigation included Mr. Kenneth Clark (CEG), Allen Harker (PG) and Amer Razaq. Dr. Janet Sowers examined soil profile development in both trenches. FCL geologists Bill Godwin (CEG) and Dr. Ozgur Kozaci provided technical review of this report. Trench logs were drafted by Carolyn Mosher.

The detailed field mapping of the San Andreas fault near the school was conducted in 2020 by Donald Wells and Janet Sowers.

Fugro appreciates insightful discussions and review of field data with Ron Rubin and Jennifer Thornburg of the California Geological Survey.

1.5 Limitations

The conclusions and recommendations contained in this report are professional opinions derived in accordance with current standards of professional practice. This report has been prepared for the exclusive use by Moore Twining Associates, Inc. (Moore Twining) and applies only to the San Juan School site. In the event that there are new or different geologic evidence or assumptions that affect the proposed project, the conclusions and recommendations contained in this report should not be considered valid unless the relevant new data are reviewed by a Fugro geologist. This report presents the results of a fault rupture hazard evaluation and is not a geotechnical assessment of site conditions for the proposed development. Geotechnical engineering assessment and recommendations are included in Moore Twining's geotechnical engineering and geologic/seismic hazard investigation report.

Reliance on this report by others for other projects at this site, or projects at other sites, must be done at their own risk unless Fugro and Moore Twining are consulted.

2. Data Review and Aerial Photo Interpretation

In this section we present a brief review of published information on the San Andreas fault in the San Juan Bautista area, to understand the patterns of faulting that have been previously documented and the current research on fault activity and earthquake recurrence. This is followed by an analysis of the tectonic geomorphology of the site and a thorough review of previous geotechnical and geologic reports prepared at and near the project site.

Fugro reviewed stereo air photos, LiDAR digital elevation data and online aerial imagery to evaluate the geomorphic and tectonic geomorphic setting of the site for potential surface faulting and/or ground deformation, as well as reports of previous investigations within and adjacent to the San Juan School site. Aerial imagery was reviewed on November 01, 2012, at the Oakland office of Aerial Science, and consisted of post-1979 imagery at various scales (Table 1). LiDAR digital elevation data covering the site vicinity had a resolution of one-half-meter and was collected by the Northern California Fault System LiDAR Survey on March 21 through April 17, 2007. Derivative hillshade, slope, and contour maps were generated from these data to highlight fault-related lineaments. These maps were compiled in ArcGIS along with digital Quaternary fault maps (Jennings, 1994; CGS 1974), regional geologic maps (Figure 2) (Wagner et al., 2002), and raster images of 7.5-minute topographic maps (U.S. Geological Survey).

Table 1: Stereo Air Photos Reviewed for this Study

Stereo Pair Imagery	Date	Scale	Source
AV-1700-17-52 and AV-1700-17-53	05-14-79	1:54,000	Aerial Science
AV-3411-7-7 and AV-3411-7-8	11-05-88	1:36,000	Aerial Science
SBN-AV-5200-45-27 and SBN-AV-5200-45-28	11-07-96	1:12,000	Aerial Science

2.1 The San Andreas Fault

The San Andreas fault is the dominant strike-slip fault defining the boundary between the Pacific Plate and the North American Plate. It has a total length of about 800 miles. The fault is subdivided into segments based on geology and seismicity (Schwartz et al., 2014). The San Juan Bautista segment of the San Andreas fault is a transition zone between the Santa Cruz Mountains segment, characterized by large recurring earthquakes, and the creeping section to the south, characterized by slow creep and infrequent smaller earthquakes. It is an area of moderate seismicity. A shallow creep rate of 12 mm/yr on the San Juan Bautista segment is estimated by Johanson and Burgmann (2005).

The earliest recorded earthquakes felt in San Juan Bautista occurred in 1800. Buildings were damaged and ground cracks were reported near rivers (Schwartz et al., 2014). Six earthquakes of $M \geq 6$ may have taken place between 1840 and 1899. The largest instrumentally recorded earthquake on the San Juan Bautista segment was M5.5 (Johanson and Burgmann, 2005).

The fault trace adjacent to the town of San Juan Bautista and the school is a remarkably linear feature that follows a prominent escarpment (Figure 2). A parallel fault strand mapped east of the main strand is considered a less active feature (Figure 3) (USGS and CGS).

Fugro conducted a general literature search and found no studies that update the mapping or characteristics of the San Andreas fault in the San Juan Bautista area, except for a study of fault slip behavior in the San Juan Bautista area published by Taira et al. (2014). This study examines seismicity records to better understand the spatial and temporal distribution of fault slip along the creeping section of the fault near San Juan Bautista and does not include any new information regarding the location of potential rupture along the fault.

As part of the 2020 and 2022 updates, we contacted Jennifer Thornburg and Ron Rubin of the California Geological Survey, and Belle Philibosian of the U.S. Geological Survey and asked if they were aware of any recent research on this segment of the San Andreas fault. In 2012, Ms. Thornburg and Mr. Rubin visited and reviewed Trenches A and B at San Juan School. All three of these research geologists replied that they were not aware of any new studies of the San Andreas fault in the San Juan Bautista area.

2.2 Geomorphic and Tectonic Geomorphic Evaluation

The site lies at the toe of a low-relief, northeast-sloping Quaternary alluvial fan located along the western margin of San Juan Valley (Figures 2 and 3). Fan material at the site consists of interbedded sands, silts, clayey sands and silts, and sandy gravels, discussed in detail in Section 4.0. Based on the granitic composition of gravel clasts exposed in the trench (discussed in Section 4.0), the fan sediments were sourced from the adjacent San Juan Creek drainage, which together with the next smaller drainage basin to the northwest, bounds a reentrant in the western margin of San Juan Valley (Figure 2) The site itself is located approximately 1,300 feet northeast of the range front. A geotechnical boring drilled on the south corner of the San Juan School campus (D&M Consultants, Inc., 2002) encountered fine- to coarse-grained clayey and sandy sediments to the depth of boring termination at 41 feet, indicating a minimum thickness for the fan sediments. The fan surface that underlies the site is inset into a northwest-trending fault-parallel ridge (Figure 3). Regional geologic mapping of the San Juan Valley (Wagner et al., 2002) indicates the ridge is also underlain by Quaternary alluvium.

Approximately 150 feet beyond the northeast edge of the site, the alluvial fan is truncated by a prominent linear escarpment, the base of which coincides with the mapped trace of the San Andreas fault (Figure 2). The escarpment trends northwest and can be traced for 1.7 kilometers. Beyond the ends of the escarpment the fault lacks obvious geomorphic expression until it enters the adjacent ranges. There it is defined by linear drainages incised into Mesozoic and Paleozoic bedrock (Figure 2) (Wagner et al., 2002).

On the school site, tectonic geomorphic indicators of active faulting such as tonal and/or vegetation lineaments, side-hill benches, topographic escarpments, ponded alluvium, anomalous drainage patterns, and offset or deflected channels (e.g., McCalpin, 1996), were not identified. We note, however, that the available historical aerial photographs and LiDAR data reviewed in this study are dated after the establishment of the town of San Juan Bautista. Buildings and roads may have obscured any original subtle fault-related features. Thus, the imagery has limited usefulness for evaluating the predevelopment landscape and possible fault-related lineaments. Geomorphic indicators of active faulting noted off-site, such as the prominent linear escarpment associated with the main trace of the fault, did not reveal trends suggestive of faulting on the site.

The fault-parallel ridge that extends northwest of the site is 100 meters wide and extends for 1.2 kilometers (Figure 3). The gap in the ridge where the school is located is interpreted to be an erosional gap created by San Juan Creek. Trench A lies on slightly higher ground to the south of the gap, presumably the continuation of the ridge. Because of its parallelism, narrowness, and close proximity to the fault, the ridge is suggestive of a pressure ridge. Pressure ridges, or flower structures (e.g., Harding, 1983; Sylvester, 1988), are relatively narrow uplifted blocks that are bound on both sides by faults with converging dips—usually a strike-slip fault coupled with a reverse or oblique-slip fault. These types of features are common in transpressional settings, where translational motion is non-parallel to the master strike-slip fault(s). The presence of a pressure ridge adjacent to the fault at this latitude is consistent with the local trend of the San Andreas fault, which strikes approximately 15° counterclockwise relative to the regional trend of the fault system southeast of San Juan Bautista (i.e., the fault is in a restraining geometry). If the pressure ridge interpretation is correct, the site would be in the hanging wall of a southwest-vergent reverse fault that forms a splay off the San Andreas fault. Because no evidence of surface faulting was identified in the data reviewed or collected for this study, the antithetic fault may be present only at depth, causing gentle tilting and folding of surficial sediments over the tip of the blind fault (See. Section 4 for discussion of tilted beds exposed in Trench A.)

2.3 Previous Studies

Two previous fault investigation studies were conducted adjacent to the San Juan School site. In 1987, Cleary Consultants performed a fault location investigation for planned San Juan Junior High School additions. The work involved the excavation and logging of two trenches totaling 770 feet in length. In 2002, D&M Consulting Engineers conducted a geologic, seismic, and fault hazards assessment for a proposed addition to the kindergarten building at San Juan Elementary School. This study involved the excavation and logging of a single trench 192 feet long within the property east of San Juan School.

Both the 1987 and 2002 studies included fault trenching to look for possible fault splays that might intersect the new developments as proposed at that time. The locations of Cleary trenches (ET-1 and ET-2) and the D&M trench are shown on Figure 4. All three trenches exposed planar-bedded alluvial silts, sands, and gravels with clear bedding contacts that demonstrated the absence of shear zones or offsets indicative of faulting.

Neither investigation found evidence of fault displacement in the trench exposures, however, one trench showed evidence of possible folding. Trench ET-1 of the Cleary investigation was located along the northwestern perimeter of the school property, extending 620 feet northeast from The Alameda to the property boundary adjacent to the San Andreas fault (Figure 4). Most of the trench encountered flat lying fluvial sands, silts, and granitic gravels with some channeling and interfingering of beds. However, at the northern end where the trench passed through the margin of the fault-parallel ridge (Figure 4), the flat-lying sediments appear to onlap older fluvial sediments that arch upward and then downward toward the fault, forming a gentle anticline. No evidence of fault rupture was observed; however, the arching of the older beds suggests some folding may have taken place adjacent to the fault. This folding suggests a tectonic origin for the fault-parallel ridge where the Mission and other historical buildings are sited, consistent with a pressure ridge model (Figure 3).

Trench ET-2 was excavated close to the fault in the low flat area beside the school, north of Trench B of the present study (Figure 4). This trench encountered flat-lying fluvial sands, silts, and gravels with no evidence of fault rupture, displacement, or folding.

The D&M trench was located east of the school on the private property near the location where Trench A of the present study was excavated. This trench extended 192 feet and exposed 7 to 10 feet of fluvial sands, silts, and granitic gravels. No evidence of fault rupture or other deformation was observed. D&M estimated a late Pleistocene age for the deposits based on assessment of soil profile development. Subsurface conditions were further explored by drilling a 41.5-foot borehole in the southeast corner of the school property. This borehole encountered beds of sandy clay, silty sand, and gravelly clayey sand to the bottom of the hole, indicating that the alluvium is at least 41 feet thick at this location. Groundwater was encountered at a depth of 28 feet on the day the boring was drilled in October 2002.

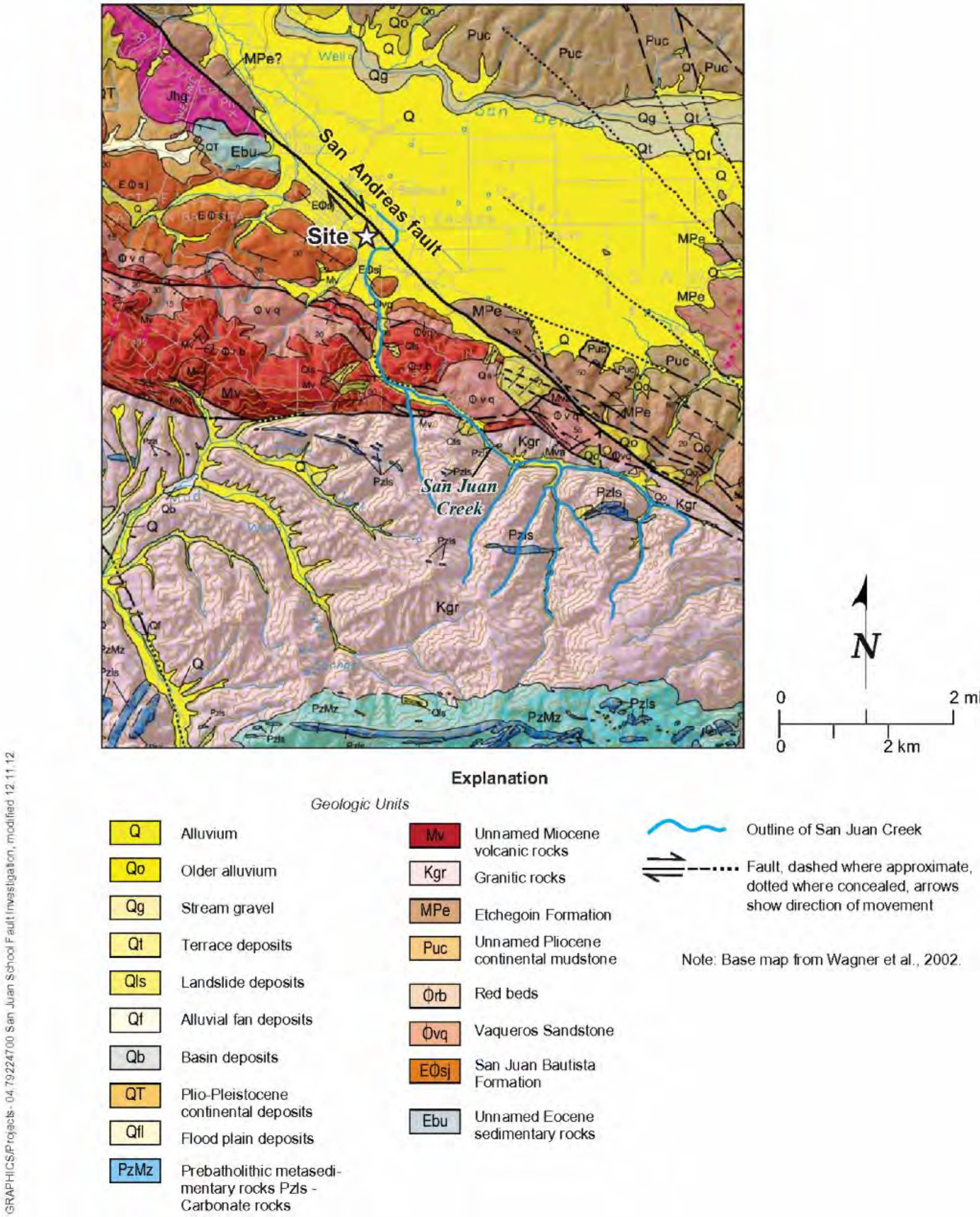


Figure 2: Geologic Map of the Site Area

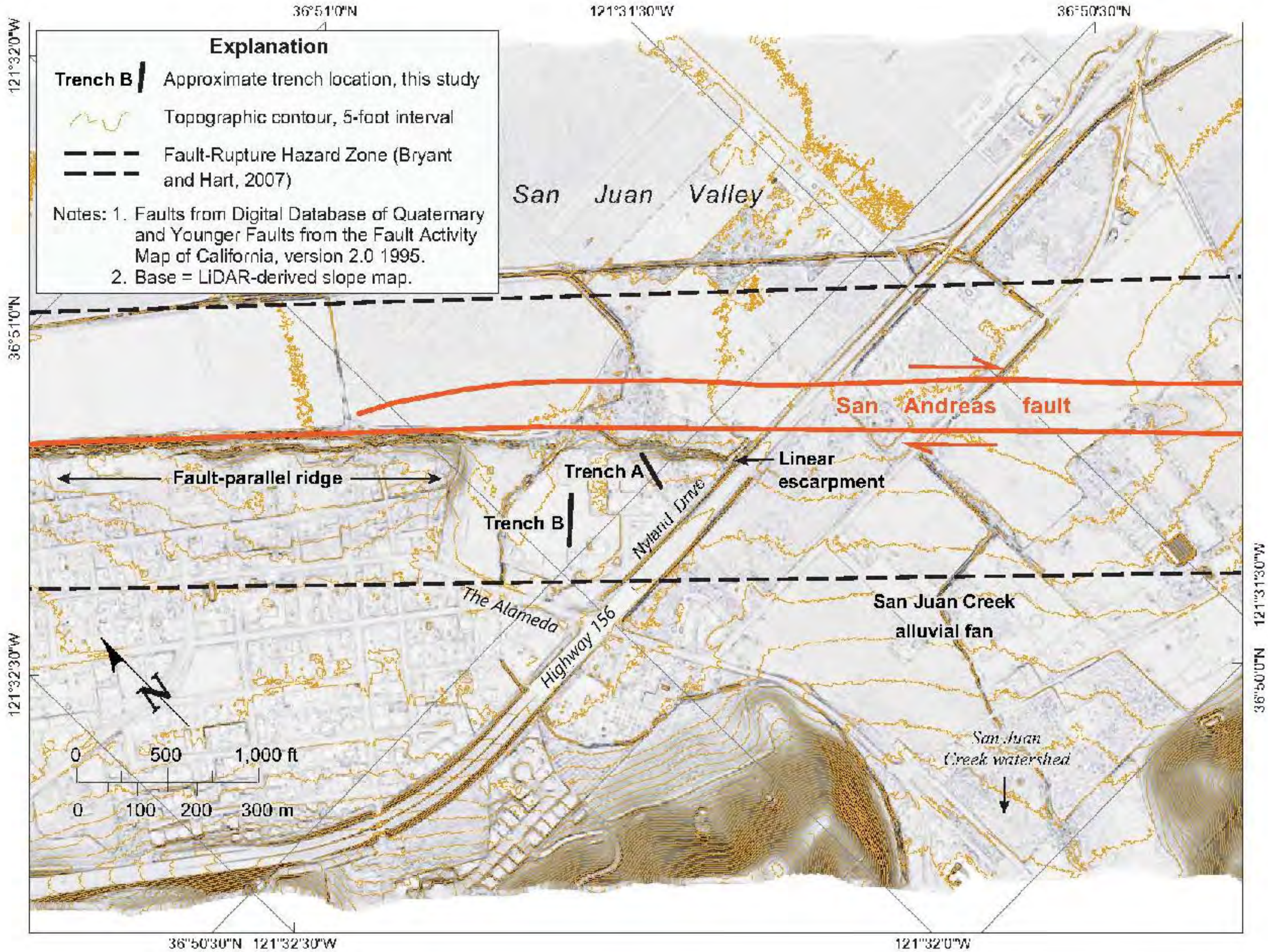
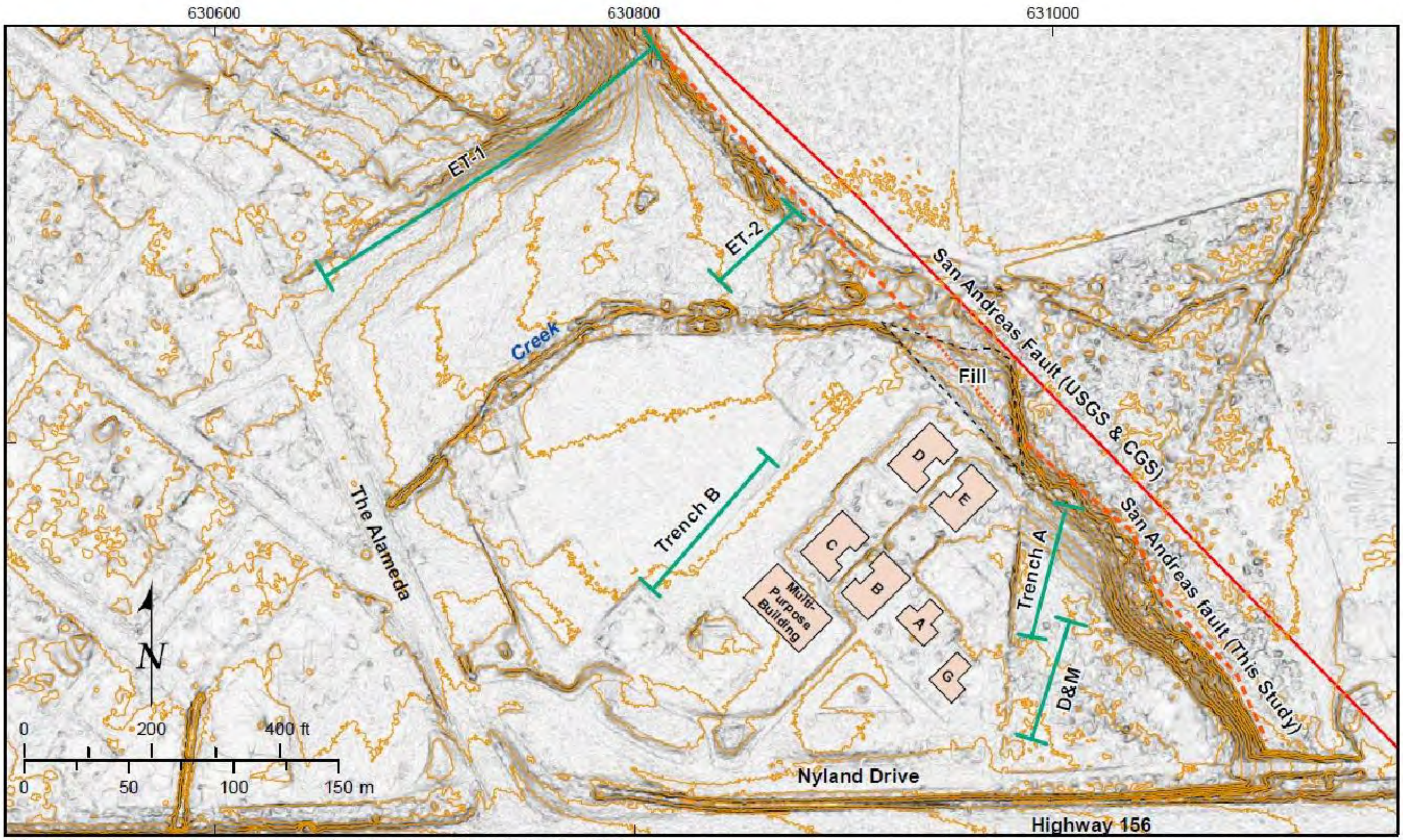


Figure 3: Geomorphology and Faults



Base Map: Slope map and contours derived from lidar data, USGS lidar 2019

Legend

Trench Location — Elevation contour, 2 ft. interval — Proposed project site

Trench	Reference
ET-1	Clearly Consultants, 1987
ET-2	Clearly Consultants, 1987
D&M	D&M Consulting Engineers, 2002
Trench A	MTA-FC, 2012
Trench B	MTA-FC, 2012

Figure 4: Site Map Showing Fault Investigation Trenches

3. Field Reconnaissance

Field reconnaissance was conducted in 2020 to examine the relocatable classroom site and document any geomorphic evidence that may bear on the presence or absence of previously unrecognized fault splays at or within 50 feet of the proposed building locations, and to better locate the main trace of the San Andreas Fault adjacent to the school. Geologists Janet Sowers and Donald Wells visited the school on April 8, 2020 and conducted three traverses. The visit was coordinated with Dan Carrillo of the District.

Traverse 1 took place on the school grounds and was guided by Gabriel, an employee of the school. We visited the area northwest of and adjacent to building D where relocatable classrooms were be constructed. It is a vacant site where two older temporary structures had been located. According to Gabriel, these two structures were torn down in August of 2019. The area appears as a light gray rectangle in the 2021 air photo in Figure 1.

On April 3, 2012, MTA drilled two borings in the asphalt pad. The borings were clearly marked by a black asphalt plug. We speculated that the pad was on some thickness of fill, based on the presence of coarse construction sand as spoils around one of the borings.

In Traverse 2, we entered the private property adjoining the southeast side of the school, walked along the line of former Trench A to the top of the scarp, and descended the scarp. Our purpose was to examine the scarp and the mapped trace of the fault and look for evidence of the presence of a fault splay. At this location, the San Andreas fault is mapped across a marshy flat about 80 feet beyond the base of the scarp (USGS and CGS). The slope was overgrown with thick vegetation including blackberry, English ivy, and willow, thus ground features were difficult to discern. A slash line of cleared vegetation beneath the power lines afforded some views.

As exposed by the slash line, we were able to locate a north-south-trending scarp that showed clearly in the lidar topographic data. This scarp seems unlikely to be a stream cut, as the slope is relatively even and gentle, and its orientation makes it unlikely to be a fault scarp in consideration of the un-faulted sediments in Trench A, directly south of the scarp. Our interpretation is that the scarp is the margin of a body of fill, probably a road embankment for a farm road that descended northward from the terrace to the fields as shown on a historical topographic map from 1955 (U.S. Geological Survey San Juan Bautista, CA 7.5' quadrangle, scale 1:24,000). Additional fill may be present west of the road embankment, possibly pushed out as waste from grading during school construction. The area is covered with grass and non-native poplar trees that do not occur on the rest of the slope, so were probably planted to cover the fill. The interpreted extent of this fill is shown on Figure 4.

We walked up the slope to view the proposed building site across the fence, then walked back along the fence line, completing Traverse 2.

In Traverse 3 we walked the perimeter of the mowed field on the north side of the creek extending along the northeast side of the school property to observe the locations of the Cleary Consultants (1987) trenches ET-1 and ET-2 (Figure 4). This area is underlain by younger stream terrace deposits which are inset into the higher and older stream terrace deposits that underlie the main school buildings and the town. The younger stream terrace is vertically displaced along an east-facing escarpment that parallels the mapped trace of the San Andreas fault. This scarp is in good alignment with the main northwest-trending scarp east of Trench A.

As a result of these traverses, we concluded that the main trace of the fault may lie at the base of the prominent linear escarpment, as shown by the dashed red line on Figure 4. A small segment of the fault is covered by fill. This trace is 60 to 80 feet closer to the school than the trace shown by the USGS & CGS. This magnitude of difference is not unexpected given the regional nature of the USGS&CGS map product. Establishing a more precise location of the fault at the site is important so that setback requirements can be met.

4. Trench Investigation

Two exploratory trenches were excavated to characterize the near-surface stratigraphy and structure of the site. It is understood that Moore Twining Associates provided a copy of the project work plan to CGS, discussed the proposed trench locations with CGS, and that CGS's only suggestion was to extend Trench B about 50 feet further to the southwest. Moore Twining has indicated that the actual locations of the trenches excavated are consistent with the proposed trench locations, plus the extension of Trench B to the southwest. When combined with a previously excavated trench on the property east of the school campus (D&M Consulting Engineers, Inc., 2002), the location and orientation of these two new trenches provide a “screen” to intercept any potential vertical, northwest-striking faults that are sub-parallel to or splay from the mapped trace of the San Andreas fault, with respect to the six (6) existing buildings to be upgraded and the proposed multi-use building. Fugro’s involvement in the field component of the trenching investigation was limited to logging and analyzing the geologic relationships exposed in the trench walls and conducting soil profile analyses (Plates 1 and 2). Excavation, shoring, cleaning, and establishing level-lines in the trenches were overseen by Moore Twining Associates, Inc.

4.1 Trench Exploration Program

Two exploratory trenches (Trench A and Trench B) were excavated to evaluate the presence or absence of active surface faulting within the site envelope. Figure 1 is a plot plan showing the locations of the two trenches in relation to school buildings and the mapped trace of the fault. Trench A was excavated in an undeveloped field on the adjacent property. The trench extended for approximately 200 ft along an azimuth of 015°/195°. The northeast end of Trench A extended just beyond the crest of the linear escarpment described in Section 2.1. Trench B was excavated on the edge of a grassy playing field next to the asphalt basketball court on the school campus. The trench extended for approximately 277 ft along an azimuth of 045°/270°.

All trenches were excavated with a rubber-tire backhoe with a 36-inch bucket. The trench was stabilized with aluminum hydraulic speed shores spaced at 4 to 5-ft intervals (not shown on the trench logs on Plates 1 and 2). The southeastern wall of each trench was cleaned in its entirety to remove backhoe smear and provide a fresh exposure. Stratigraphic contacts were marked with nails and colored flagging tape. Distinct marker beds (e.g., thin layers of clay or laminar silt and clay beds) were used as strain markers across the length of the trenches to evaluate the presence or absence of fault or fold deformation (e.g., McCalpin, 1996). Level lines strung along the lengths of the trenches provided a survey datum for trench logging. Trench A was logged at a scale of 1 inch equals 3 feet (1:36) and Trench B was logged at a scale of 1 inch equals 2.5 feet (1:30). Both trench logs are presented at a uniform scale of 1-inch equals 5 feet on Plates 1 and 2. Stratigraphic units and horizons were described using the Unified Soil Classification System (USCS) with additional observations noted using standard geologic and soil nomenclature (e.g., Birkeland, 1999).

Age determination of the deposits was based on soil profile development and weathering, as discussed in Section 4.3.

4.2 Trench Stratigraphy

The stratigraphy exposed in the trenches consisted of alluvial fan deposits of sand, silt, clay, and gravel. The dominant sedimentary structures observed in both trenches include channels, cross beds, laminations, graded beds, and massive beds. Due to the preponderance of channeling, many of the units were laterally discontinuous, and characterized by abrupt-to-sharp and wavy basal contacts. The most laterally continuous unit was a gray to dark reddish brown fat clay bed, which was traced along the base of Trench B for over 100 feet (Station 1+70 to 2+77).

Finer-grained deposits in both trenches were damp to moist, and soft. The sandy gravels were damp to dry, and dense.

4.2.1 Trench A

Five stratigraphic units were recognized in Trench A and are described in order from oldest to youngest. Detailed descriptions of the units and subunits are provided on Plate 1. Unit 1 is a fine-grained sequence of well-stratified and laminated sands, dipping 5° to 8° to the southwest (subunits 1A through 1D). Unit 2 consists of locally cross-bedded and interfingering sand and gravelly sand (southwest), and sandy gravel (northeast), with lithologic contacts that dip gently southeastward approximately parallel to the dipping beds of Unit 1. Unit 3 consists of clast-supported sandy gravels with nested channel deposits and sand lenses, with flat-lying stratification. Unit 4 is a well-graded sand, silt and gravel deposit that dips to the northeast, parallel to topographic slope, and is interpreted to be colluvium derived from the underlying units upslope. Unit 5 is a fine sandy silt deposit that mantles the ground surface and is interpreted to be primarily of eolian origin. Unit 1 is at least 15 feet thick. Unit 2 is approximately 7 feet thick, and the basal contact with Unit 1 is an angular unconformity. Unit 3 is at least 10 feet thick. Abundant granitic clasts within this unit indicate the sediments were derived from San Juan Creek, the only local stream that drains the Cretaceous granites (Kgr) (Figure 2) . Unit 4 varies in thickness between approximately 5 feet in the northeast to less than 1 foot in the southwest, and it unconformably overlies the other three units. Unit 5 is approximately 1 foot thick. The transition from Unit 1 deposits to deposits from Units 2 and 3 may record the migration of the thalweg of San Juan Creek across what was previously an overbank or quiet water environment.

No evidence of faulting was observed in Trench A. All bedding contacts are continuous and unbroken, and there are no portions of the trench exposure that were not traversed by a continuous contact. The lower stratigraphic units, exposed in the northeastern end of the trench, however, appear to be tectonically tilted 5° to 8° to the southwest. See section 4 for discussion.

4.2.2 Trench B

Trench B, similar to Trench A, exposes alluvial fan deposits of sand, silt, clay, and gravel. The lithologic composition of the gravels indicates a granitic source area, again derived from San Juan Creek. All strata are flat-lying and similar to Trench A, show no evidence of fault displacement.

Seven main stratigraphic units were identified in Trench B. Units 1, 2 and 3 are beds of silty and clayey sands that exhibit yellow- to reddish-brown mottling and vertical streaking across stratigraphic boundaries, interpreted to be iron staining from weathering and pedogenesis. Unit 5 is a sandy gravel that fills a channel eroded into Unit 3 between Station 25 to 55 and overlies intact strata of Unit 3 as far as Station 150. Where the base of the Unit 5 gravels is traced to the southwest in Trench B, it interfingers with the underlying fine-grained sequence, demonstrating that the two are conformable and time-transgressive. Further, the base of the gravels in Trench B was disrupted in two places (Station 0+05 and 0+10; Plate 2) by ~0.5-foot-high diapir-like intrusions of sand from the underlying sequence. These features indicate that the sands were relatively loose and saturated when the gravels were deposited.

One of these intrusions, located at the base of the beds of massive sandy gravel, in the northeast end of Trench B, is a bulbous-shaped body of fine sand that rises up and intrudes the gravel deposit (See Trench B log). Although the main body of sand is laminated, the sand within the intrusion is massive. The sand intrusion is interpreted to be a liquefaction feature, and its primary significance to this study is evidence that the sand was in a liquefiable state (loose, unconsolidated, and saturated) at the time the gravel was deposited. Thus, the sand and gravel beds may be roughly contemporaneous. At present, both beds are consolidated and dry and exhibit significant weathering. The triggering event for liquefaction could have been the emplacement of the gravel itself, in which case the additional load alone could have resulted in consolidation of the sand and upward escape of pore water and liquefied sand. In addition, seismic ground shaking may have triggered the liquefaction event. Similar structures termed "seismites" have been described in the literature and attributed to seismic ground shaking of saturated, unconsolidated, bedded sediments (eg. Moretti and Ronchi, 2011).

Units 5 and 6 form the upper part of the trench exposure in Trench B. Unit 5 is a sandy gravel with decomposed granitic gravel clasts exposed in the northwest half of the trench. Unit 5 is onlapped by Unit 6, a massive sand grading upwards to sandy clay exposed in the southeast half of the trench. At the base of the trench beneath Unit 6, a consistent and continuous bed of fat clay, Unit 4, clearly indicates the absence of faulting in this portion of the trench.

Finally, the sediments are capped by dark grayish brown A-horizon that may be partly derived from eolian deposits. In general, above the top of the trench wall, the soil is granular fine sandy silt. Below the top of the trench wall, the A-horizon is characterized by prominent prismatic structure, indicating the presence of clay that forms vertical cracks as it wets and dries. Deeper in the soil profile, pedogenic carbonate in the form of filaments and crack face coatings has accumulated within the sandy clays of Unit 6 southwest of Station 190.

4.3 Soil Profile Analyses

Soil profile development was assessed in both trenches to help constrain the ages of the deposits. In Trench A a single complete profile description was made including identification of soil horizons and description of the properties of each horizon. In Trench B general observations of soil profile development and weathering were made.

Soil profile SP-SJS-01 was described on the east wall of Trench A at approximately the 136-foot mark, at the crest of a low grassy rise (Plate 1). The location was chosen as most likely to exhibit maximum thickness of the soil profile on this moderately eroded landform. In addition, the soil is formed in gravelly alluvium at this location as opposed to sandy silts, enabling the description to include an evaluation of gravel weathering.

Major features of this soil include a thick dark-gray, fine sandy silt A horizon of possible eolian origin, overlying a thin Bt horizon of clay accumulation and rubification interpreted to belong to an eroded soil profile developed in Pleistocene alluvial fan deposits. The Bt horizon grades downward into weathered gravelly alluvium in which 60 to 80% of granitic clasts are highly weathered, falling apart with the blow of a hammer.

This soil is formed primarily in sandy and gravelly, granitic alluvium that was deposited on the alluvial fan of San Juan Creek, which drains hills underlain by Cretaceous granites (Figure 2). The soil profile is truncated by erosion and is overlain by a younger deposit of fine sandy silt in which a dark grayish brown A-horizon is developed. This silt is probably of eolian origin, based on its consistent fine grain size and the uniform mantle it forms over the land surface as exposed in the trench walls (Plate 1). Silt and fine sands from San Benito River alluvium in San Juan Valley are a possible source of the material. The base of the silt deposit is slightly clayey with a weak prismatic structure and is designated the A/B horizon; it features both organic matter accumulation and minor clay accumulation. Directly beneath the A/B horizon, lies the soil developed in the granitic alluvium. The uppermost horizon of this soil is the zone of maximum accumulation of clay (Bt1 horizon) within the truncated soil profile. Organic matter from the A horizon has darkened this horizon, masking its rubification. Rubification is therefore greatest in the underlying Bt2 horizon, although clay accumulation is somewhat less. Both clay and rubification decrease with depth in the Bt3 horizon. The C-horizon of weathered alluvium underlies the Bt3 horizon and is broken into sub-horizons based on bedding characteristics of the parent alluvium. The C3-horizon at the base of the exposure features color variations in the bedding interpreted to be the result of groundwater fluctuations causing mobilization and precipitation of iron.

With the exception of the upper silt soil and colluvium, the soil in Trench A is judged to be late Pleistocene in age based on two types of evidence, geomorphic and pedogenic. Significant landform evolution has taken place since the alluvial fan deposits exposed in the trench were laid down. This northern portion of the San Juan Creek alluvial fan, where Trench A is sited, sits above the level of the modern alluvial fan and is truncated by the San Andreas fault. Slow episodic vertical uplift on the southwest side of the San Andreas fault has gradually displaced the fan sediments and created a linear scarp face, about 6 meters high near Trench A (Figure 3). Creation of the fault scarp may have taken thousands of years, depending on the uplift rate. By contrast, the modern alluvial fan, shown by the regularly spaced contours on Figure 3, grades to the San Juan Valley and crosses the fault without offset just north of Trench A.

Examination of the lidar topographic data in ArcGIS shows that on the north side of the creek, the elevation of the inset terrace drops about 6 feet across the scarp to the agricultural fields below. The terrace surface steepens as it approaches the scarp, possibly indicating drag on the uplifted block.

In addition, the scarp face has been significantly modified by erosion. Stratigraphic bedding in the alluvium near the scarp is truncated where erosion has rounded the scarp face (north end of

Trench A, Plate 1). Gentle rounding of the scarp face may also take thousands of years (Hanks, 2000).

Pedogenic characteristics of the soil including extreme weathering of the granitic clasts, the accumulation of clay, and degree of rubification are consistent with a late Pleistocene age (11,000 to 100,000 years).

Table 2. Soil Profile Description, Trench A – Station 136 (See Plate 1 for location)

Horizon	Depth	Description
A	0-46 cm	Dark grayish brown (10YR 4/2, dry) fine sandy silt loam with many pores, slightly hard to hard, non-sticky, non-plastic, weak granular structure, no visible clay films.
A/B	46-62 cm	Brown (10 YR 4/3, 4/4, dry) slightly clayey silt loam, moderate coarse prismatic structure breaking to moderate fine angular blocky structure, less than 10% fine to coarse subangular gravel, hard, slightly sticky, slightly plastic, no visible clay films, clear wavy boundary.
Bt1	62-88 cm	Dark yellowish brown (10YR 4/4, dry) sandy clay loam, weak angular blocky structure, 50 percent fine to coarse, angular to subrounded gravel, hard, sticky, slightly plastic to plastic, few faint to distinct clay films, gradual wavy boundary. Granitic clasts are highly weathered. Maximum clay occurs in this horizon.
Bt2	88-128 cm	Brown to yellowish brown (7.5YR 5/4 to 10YR 5/6, dry) loamy sand, 50 percent fine to coarse angular to subrounded gravel, weak angular blocky structure, slightly hard, non-sticky, non-plastic, few faint to distinct clay films. Granitic clasts are highly weathered. Maximum rubification occurs in this horizon.
Bt3	128-187 cm	Yellowish brown (10YR 5/4, dry) loamy sand, 50 percent fine to coarse, angular to subrounded gravel, soft, few faint to distinct clay films, clear wavy boundary at base of massive sandy gravel unit. Granitic clasts are highly weathered.
C1	187-241 cm	Brown (10YR 5.3, dry) loamy sand, ~5-% fine angular to subrounded gravel, soft, very few faint clay films, soft, very few faint clay films, clear wavy boundary. Stratified, sandy, granitic gravel. Granitic clasts are highly weathered.
C2	241-286 cm	Pale brown to light yellowish brown (10YR 6/3 to 6/4, dry) loamy sand, ~50% fine to medium angular to subrounded gravel, single grain, slightly hard, very few faint clay films. Granitic clasts are highly weathered. Stratified, sandy, granitic gravel.
C3	286-330 cm	Yellowish brown to light brownish gray (10YR 5/4 to 6/2, dry) loamy sand, ~50% fine to coarse angular to subrounded gravel, no clay films, color varies with strata reflecting iron accumulation, probably as the result of periodic groundwater saturation. Granitic clasts are highly weathered. Stratified, sandy, granitic gravel.

5. Discussion

This section presents discussion and analysis of the results of the study and findings relevant to the potential presence of unmapped active fault splays at the project site, and an evaluation of the building locations relative to California active fault setback requirements.

5.1 Results of Trenching Studies

The trench data from this study provide a basis for interpreting the displacement potential and fault rupture hazard at the site. Based on the available information, FCL judged that the trenches did not expose any strands of the San Andreas fault zone. This conclusion is based on the identification of a series of uninterrupted, horizontally overlapping stratigraphic horizons and marker beds, which could be traced laterally across each trench (Plates 1 and 2). The lateral continuity of these marker beds precludes the occurrence of fault displacement and associated ground rupture at the site since deposition of the strata. Based on the disaggregated nature and decomposition of the granitic clasts within the conglomerate, and the development of an argillic horizon and rubification in the soil profile, the deposits exposed in the trenches are interpreted as being older than 11,000 years.

At the latitude of the site, the surface trace of the San Andreas fault is well expressed as a linear escarpment in Quaternary alluvium, and is located approximately 100 feet beyond the northeast end of Trench A. The absence of any faulting southwest of the mapped trace of the San Andreas fault is consistent with the results from this study as well as earlier trench studies on the adjacent properties (Cleary Consultants, Inc., 1987; D&M Consulting Engineers, Inc., 2002). Three paleoseismic screening trenches excavated on property adjacent to the school campus prior to this study (Cleary Consultants, Inc., 1987; D&M Consulting Engineers, Inc., 2002) all encountered bedded fluvial sediments with no evidence of fault rupture. Further, two magnetometer surveys were conducted across the western edge of the campus in conjunction with the trenching (Cleary Consultants, Inc., 1987), and the only magnetic intensity anomalies—proxies for crossing a fault—occurred where the survey line crossed the linear escarpment or passed beneath overhead power lines.

Evidence of tectonic deformation at the site was identified during this study and consisted of back-tilting of beds in the fine-grained sequence exposed in Trench A. Laminations and thin horizons in sand and silt had an apparent dip of 5° to 8° to the southwest (Plate 1). It is unlikely that the beds were deposited with these dips because: (1) the inclination is too steep for fine-grained, laminated sediments, which were most likely deposited near the distal toe of the San Juan Creek alluvial fan; and (2) the southwest dip direction is opposite the local topographic gradient, which is inclined to the northeast. The deformation observed in Trench A, as well as the possible gentle folding in Trench ET-1 (Cleary Consultants, 1987) are consistent with growth of a pressure ridge along the San Andreas fault.

The potential for permanent ground deformation associated with differential tectonic tilting or folding at the San Juan School site during a large earthquake merits discussion. If the tilting and folding observed in Trench A and Trench ET-1 are tectonic and coseismic, the amount of deformation per seismic event can be estimated by considering the age of the sediments and the frequency of large earthquakes on the San Andreas fault. The sediments are estimated to be late Pleistocene, a minimum of 11,000 years in age. Large earthquakes (> 6.8 M) on the San Andreas fault are thought to have occurred every 150-250 years in the late Holocene, based on work in the Watsonville area by Streig et al, 2012). Extrapolating this rate, approximately 55 earthquakes would have occurred over the past 11,000 years. Assuming a cumulative maximum of 8° of tilting over this time period, the amount of tilt per event would be approximately 0.15°, a value unlikely to cause structural distress. This is a conservative estimate of tilting per event, as the age estimate of the tilted sediments is a minimum value. Sediments in Trench B, which show weathering and pedogenesis consistent with a late Pleistocene age, are flat lying, suggesting that the tilted sediments in Trench A may be significantly older than 11,000 years. Therefore, the potential impact of tectonic tilting on structural distress at the site is considered low, and the potential for permanent ground deformation is also considered low.

5.2 Likelihood of Additional Fault Splays

Based on examination of geomorphic features and on review of existing fault trenching data, the likelihood of secondary fault splay through the project site is judged to be low. We identified no geomorphic evidence from field reconnaissance or from high resolution topographic data that would indicate the presence of a secondary fault splay that would extend closer to the school than the base of the scarp (shown as the dashed red line on Figure 4). Although grading from school construction may have destroyed any potential fault scarp extending across the main scarp and higher terrace surface, the location and overlapping ground coverage of the previous trenches at and near the school site as shown on Figure 4, provide a strong framework to assess the potential for fault rupture at the project site. Specifically, these trenching studies (Cleary, 1987, Dames & Moore, Moore Twining, 2012) consistently demonstrate a lack of fault displacement in alluvial sediments exposed in the six trenches dug on and near the school property.

5.3 Evaluation of Setback Requirements

The prominent linear scarp, assumed to represent the trace of the San Andreas fault northeast of the campus, does not coincide well with the trace of the San Andreas fault as mapped by the California Geological Survey and shown on the Quaternary fault and fold database (USGS/CGS). The base of the linear scarp along the northeast side of the school is 50 to 85 feet west of the mapped trace (Figure 4) thus significantly closer to the school. Our interpretation is that the discrepancy falls within the margin of error of the original fault mapping. The original mapping of the fault was compiled at a scale of 1:24,000, prior to public availability of high-resolution topographic data. An error of 80 feet would represent a mere 0.04 inches (1 mm) on a 1:24,000 scale map. This mapping should not be considered accurate at a local scale and may not be appropriate for measuring fault setbacks. On Figure 4 we map an alternate fault location, labeled "San Andreas fault (This Study)," which tracks the base of the scarp adjacent to the school.

Assuming the base of the escarpment is adjacent to the school (dashed red line on Figure 4) most closely represents the location of the primary trace of the San Andreas fault, the nearest walls of the closest buildings scheduled for rehabilitation (the northeast walls of buildings D and E) measure approximately 80 feet from the surface trace of the fault.

However, common practice is to assume that the fault could lie just beyond the end of the closest trench. If we draw a line between the north ends of Trench A and Trench ET-2, neither of which encountered a fault, this line can be used as a conservative estimate of the nearest possible location of the trace of the San Andreas fault. Measured from this line, the northeast walls of buildings D and E are 55 feet away from the fault. Other project buildings (A, B, C, G, and the multi-purpose building) are more than 240 feet away from the fault. Thus, all project buildings meet the State of California 50-foot setback requirement.

6. Summary and Conclusions

Based on the available information, we summarize our findings and conclusions regarding surface-fault rupture hazard relative to the proposed improvements at the San Juan School site as follows.

- Exploratory trenches (Trench A and Trench B) on the east and west sides of the San Juan School project site exposed late Pleistocene alluvial and fluvial sediments older than ~11,000 years. These sediments include several excellent markers with which to evaluate the presence or absence of active faulting.
- No active faults were documented in Trench A and B exposures. The sediment layers, and continuous marker horizons, provide positive evidence for the absence of fault offset. These findings, in conjunction with the findings of the previous investigations (D&M Consulting Engineers, Inc. 2002, and Cleary Consultants, Inc., 1987), indicate that the surface-fault rupture hazard within the proposed improvement area of the San Juan School site is low.

- Field reconnaissance and interpretation of lidar data and historical aerial photography revealed no geomorphic evidence to indicate the presence of splay faults extending westward from the main trace toward or across the project site.

- The southwestern side of the San Andreas fault is uplifted and shows some evidence for Quaternary tilting and folding. Small amounts of deformation were observed in the trenches. Given the pre-Holocene age of the deformed sediments, the potential for permanent ground deformation (tilting or folding) is considered low.

- All proposed improvements at the project site meet the State of California 50-foot setback requirements for distance from an active fault.

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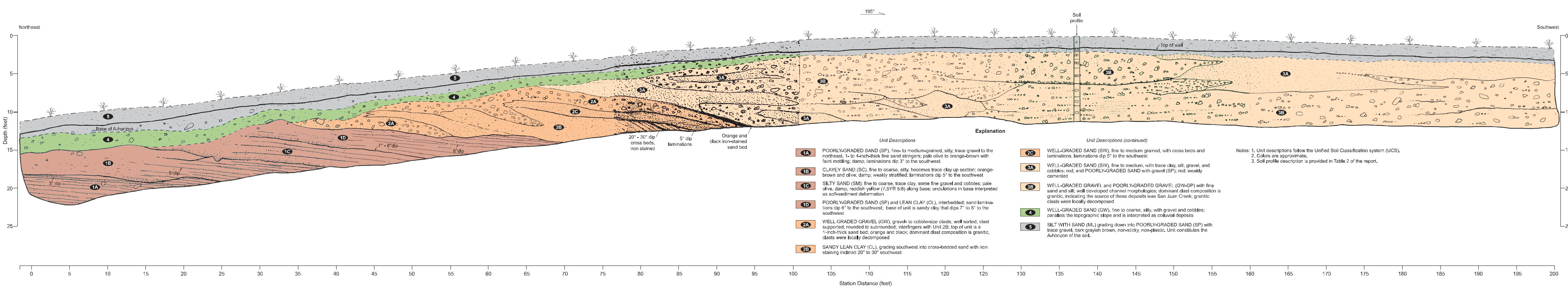


Explanation

Unit Descriptions

- **1A** POORLY-GRADED SAND (SP), fine- to medium-grained, silty, trace gravel to the northeast, 1- to 4-inch-thick fine sand stringers; pale olive to orange-brown with faint mottling; damp; laminations dip 3° to the southwest
- **1B** CLAYEY SAND (SC), fine to coarse, silty, becomes trace clay up section; orange-brown and olive; damp; weakly stratified; laminations dip 5° to the southwest
- **1C** SILTY SAND (SM); fine to coarse, trace clay, some fine gravel and cobbles; pale olive, damp, reddish yellow (7.5YR 5/8) along base; undulations in base interpreted as soft-sediment deformation
- **1D** POORLY-GRADED SAND (SP) and LEAN CLAY (CL), interbedded; sand laminations dip 6° to the southwest; base of unit is sandy clay that dips 7° to 8° to the southwest
- **2A** WELL GRADED GRAVEL (GW), gravel- to cobble-size clasts; well sorted; clast supported; rounded to subrounded; interfingers with Unit 2B; top of unit is a 1-inch-thick sand bed, orange and black; dominant clast composition is granitic, clasts were locally decomposed
- **2B** SANDY LEAN CLAY (CL), grading southwest into cross-bedded sand with iron staining inclined 20° to 30° southwest

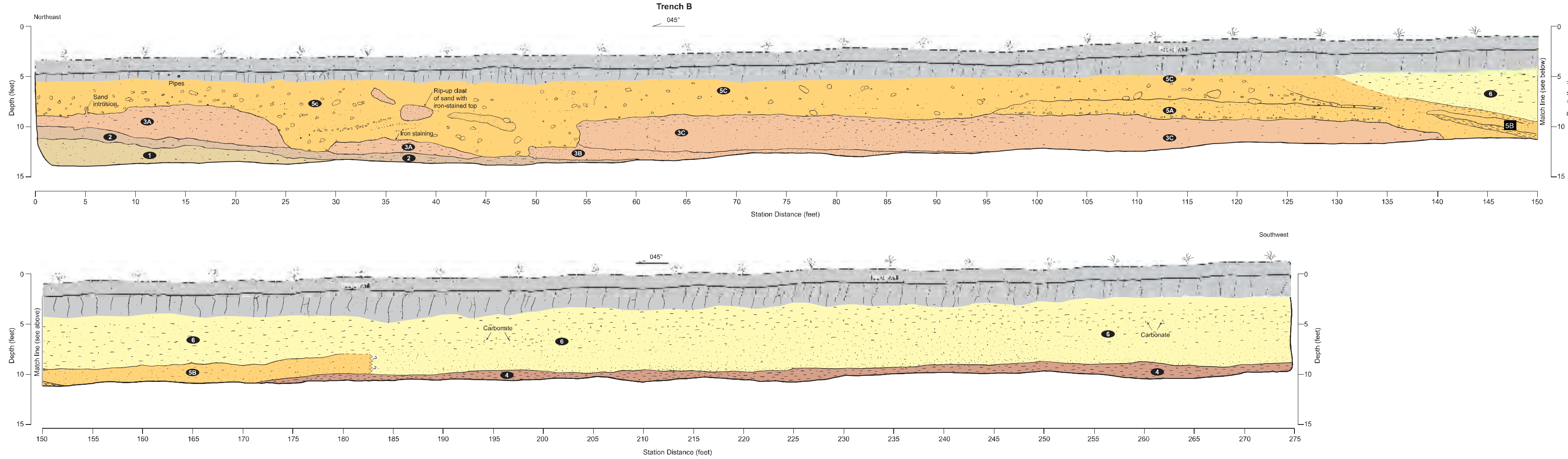
Unit Descriptions (continued)

- **2C** WELL-GRADED SAND (SW), fine to medium grained, with cross beds and laminations, laminations dip 5° to the southwest
- **3A** WELL-GRADED SAND (SW), fine to medium, with trace clay, silt, gravel, and cobbles; red; and POORLY-GRADED SAND with gravel (SP); red; weakly cemented
- **3B** WELL-GRADED GRAVEL and POORLY-GRADED GRAVEL (GW-GP) with fine sand and silt; well developed channel morphologies; dominant clast composition is granitic, indicating the source of these deposits was San Juan Creek; granitic clasts were locally decomposed
- **4** WELL-GRADED SAND (GW), fine to coarse, silty, with gravel and cobbles; parallels the topographic slope and is interpreted as colluvial deposits
- **5** SILT WITH SAND (ML) grading down into POORLY-GRADED SAND (SP) with trace gravel, dark grayish brown, non-sticky, non-plastic. Unit constitutes the A-horizon of the soil.

Notes: 1. Unit descriptions follow the Unified Soil Classification system (UCS).
2. Colors are approximate.
3. Soil profile description is provided in Table 2 of the report.

Plate 1: Log of Trench A

Trench B



Explanation

Unit Descriptions

- **1** LEAN TO FAT CLAY (CL-CH) with trace sand, light brown with reddish brown mottling, moist, dense, high plasticity. Base not exposed in the trench.
- **2** SANDY LEAN CLAY (CL) with fine sand and gravel, light brown with reddish brown mottling, low plasticity, abrupt wavy base
- **3A** SANDY LEAN CLAY (CL) with fine sand and gravel, light brown with reddish brown mottling, moist, firm, low plasticity, clear wavy base
- **3B** SILTY FINE-TO-MEDIUM SAND (SM), light brown with reddish brown mottling, abrupt wavy base
- **3C** CLAYEY SAND (SC) grading upwards into LEAN CLAY WITH SAND AND SILT (CL), light brown with reddish brown mottling, low to moderate plasticity, fine to coarse sand, wavy abrupt base with reddening along base from Station 0+55 to 0+77
- **4** FAT CLAY (CH), gray to dark reddish brown, moist, high plasticity. This unit was distinct in composition and color, and served as a marker bed in the southwestern portion of the trench. The base was not exposed.

Unit Descriptions (continued)

- **5A** SANDY CLAY (CL) fine to coarse, with fine gravel, grading westward to GRAVELLY SILTY SAND (SP), light brown with trace reddish brown mottling. From approximately Station 1+40 to 1+52, Unit 5A contained a 0.3-foot-thick bed of light brown, well-sorted, medium sand underlain by a dark gray clay layer of roughly the same thickness. The base of this unit was wavy and sharp; to the southwest it graded laterally into Unit 5B.
- **5B** FINE SANDY FAT CLAY (CH), dark reddish brown. Grades into unit 5A to the north-east, and into Unit 6 to the southwest.
- **5C** WELL-GRADED GRAVEL (GW) with sand and silt, and trace cobbles and boulders, light brown. Gravel clasts are subrounded and composed of Cretaceous granite, with 60 to 80 percent of clasts weathered to gruss. From approximately Station 0+33 to 0+48, Unit 5C contained rounded boulder-sized rip-up clasts of sand, similar to material of Unit 3, stained on the top with iron. To the southwest, Unit 5C pinches out, and interfingers with adjacent units. The base of this unit was wavy and abrupt, and fills a channel eroded into Unit 3.
- **6** SAND (SP) grading upward into FINE SANDY FAT CLAY (CH), dark reddish brown, with abundant disseminated carbonate nodules southwest of Station 1+90. The basal contact varied from sharp and wavy to the northeast, to gradational to the southwest.
- **7** SILT WITH SAND (ML) grading down into POORLY-GRADED SAND (SP) with trace gravel, dark grayish brown, non-sticky, non-plastic. Unit constitutes the A-horizon of the soil.

Notes: 1. Unit descriptions follow the Unified Soil Classification system (UCS).
2. Colors are approximate.

Plate 2: Log of Trench B

Appendix A:

Soil Profiles and Field Notes

SOIL PROFILE DESCRIPTION

William Lettis & Associates, Inc.

p. 1 of 2

Profile: SP-SJS-1

Site: San Juan School, San Juan Bautista

Elevation:

Slope:

Job #: 79.224700

Site description: Gentle slope on rise on the south side of the San Andreas fault, Trench A, at about 136-ft mark on the east wall

Date: 11-13-2012

Time:

By: JM Sowers, Ken Clark

Depth (cm)	Horizon	Boundary	Color: dominant	Color: mottles	Structure	Gravel (size, rnd, %)	Consistence (wet, moist, dry)	Texture	Clay films	Salts & silica	Notes: (pores, roots, HCl test samples, pH, etc.)
0 1 46	A	a s c w g i d b	10 YR 4/2 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f r 0 10 m sr 25 sa 50 c a 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	<5% C SC SiC SCL CL SiCL L SL SiL LS S Si	v1 f pf 1 po 2 d br 3 p co cobr	k y z q I II III IV V V+	Dark grayish brown silt many pores Eolian ?
2 62	A/B	a s c w g i d b	10YR 4/3, 4/4 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f r 0 10 m sr 25 sa 50 c a 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	5-10% clay C SC SiC SCL CL SiCL L SL SiL LS S Si	v1 f pf 1 po 2 d br 3 p co cobr	k y z q I II III IV V V+	Brown silt Sl. more clay than above
3 88	Bt1	a s c w g i d b	10 YR 4/4 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f r 0 10 m sr 25 sa 50 c a 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	co. sa, 10-20% clay C SC SiC SCL CL SiCL L SL SiL LS S Si	v1 f pf 1 po 2 d br 3 p co cobr	k y z q I II III IV V V+	Granitic alluvium Color transitional from A horizon maximum clay
4 128	Bt2	a s c w g i d b	7.5YR 5/4 10 YR 5/6 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f r 0 10 m sr 25 sa 50 c a 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	co sandy <5% clay C SC SiC SCL CL SiCL L SL SiL LS S Si	v1 f pf 1 po 2 d br 3 p co cobr	k y z q I II III IV V V+	max rubification Sandy gravel, granitic alluvium
5 187	Bt3	a s c w g i d b	10 YR 5/4 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f r 0 10 m sr 25 sa 50 c a 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL L SL SiL LS S Si	v1 f pf 1 po 2 d br 3 p co cobr	k y z q I II III IV V V+	Less rubification Sandy gravel, granitic alluvium Base of channel fill
6 214	C1	a s c w g i d b	10 YR 5/3 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f r 0 10 m sr 25 sa 50 c a 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL L SL SiL LS S Si	v1 f pf 1 po 2 d br 3 p co cobr	k y z q I II III IV V V+	Stratified sandy gravel, granitic alluvium

< Orn flag

Notes:

Figure: A-1

SOIL PROFILE DESCRIPTION

William Lettis & Associates, Inc.

p. 2 of 2

Profile: SP-SJS-1

Site: San Juan School

Elevation: ______ Slope: ______

Job #: 079.2247

Site description: Grassy rise on neighbors property on south side of school property, Trench A, east wall @ ~136'.

Date: 11-13-2012

Time: ______

By: JM Sowers, Ken Clark.

Depth (cm)	Horizon	Boundary	Color dominant	Color mottles	Structure	Gravel (size, rnd, %)	Consistence (wet, moist, dry)	Texture	Clay films	Salts & silica	Notes: (pores, roots, HCl test samples, pH, etc.)
7 286	C2	a s c w g i d b	10 YR 6/3, 6/4 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f m c; r sr sa a; 0 10 25 50 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Stratified sandy gravel, granitic.
8 330	C3	a s c w g i d b	10YR 5/4-6/2 (d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f m c; r sr sa a; 0 10 25 50 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	Stratified gravel, granitic Diff't colors in diff't strata reflect Fe accum.
	Bottom of Trench	a s c w g i d b	(d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f m c; r sr sa a; 0 10 25 50 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	
		a s c w g i d b	(d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f m c; r sr sa a; 0 10 25 50 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	
		a s c w g i d b	(d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f m c; r sr sa a; 0 10 25 50 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	
		a s c w g i d b	(d) (m)	(d) (m)	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	f m c; r sr sa a; 0 10 25 50 75 100	so po ss ps s p vs vp; lo vfr fr fi vfi efi; lo so sh h vh eh	C SC SiC SCL CL SiCL S LS SL L SiL Si	v1 1 2 3 f d p pf po br co cobr	k y z q I II III IV V V+	

Notes: Granitic alluvium 60-80% of clasts are highly weathered and fall apart when struck with a hammer

Figure: A-2

10

Location ______ Date ______

Project / Client ______

Project no.
79.224700

San Juan School
fault investigation

Notes by Janet Sowers, PG
Nov 13, 2012
Fugro Consultants, Inc.

11

Location San Juan school Date 11-13-12

Project / Client Moore - Twining Assoc.

Scale

Ken Clark - Moore Twining
Jenny Thornburg - CGS
Ron Rubin CGS

Goals: • Describe soil and est. age
• Review logging
• Check N end of Trench B
• ~~Est~~ Identify units & extent of logging.

Charcoal sample taken from Trench A sta 174 @ 43" below string (~5 ft below grd)

Ken will collect the pieces of charcoal we saw in Trench B (~3 samples)

Both trenches are about 10 feet deep and have the top 1-2 feet benched to remove the soft A-horizon.

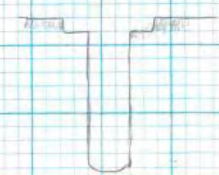


Figure: A-3

12

Location ______ Date ______

Project / Client ______

Trench A is located on a small rise on the south side of the school on private property. The ground gently slopes up, then steeply down to the north. Bedding seems planar and level in the southern third of the trench. The bedding in the northern end, where the ground slopes down, slopes back 5-8°.

The back-tilted strata are laminated sands and clayey silts, yellow-brn and gray, with planar bedding

Location San Juan School Date 11-13-12 13

Project / Client ______ Scale

Trench B is in a flat on the NW side of the asphalt playground.

Bedding is planar throughout; no evidence of tilting.

- "Sand pillows" in the N end indicate the lower sand unit was still saturated and unconsolidated when the overlying gravel was emplaced. Thus the sand and the gravel must be similar in age.

- Vertical streaks of oxidation cross strata in the lower sand beds.
- 60-80% of granitic clasts in the gravel are highly weathered.
- The south end of the trench has a thick black soil w/ vertical cracks. No slicks, but resembles a vertisol. Prismatic structure. $CaCO_3$ zone at the base of the A horizon powdery filaments and ped coatings, fracture face coatings in a horizon ~25cm thick.
- Ron found 3 nice chunks of charcoal in the sands in the south end of the trench. Ken will collect these

Figure: A-4

FUGRO

Appendix B:

Trench Photographs

See Appendix G

APPENDIX F

FAULT INVESTIGATION REPORTS PREVIOUSLY PREPARED BY OTHERS FOR SAN JUAN SCHOOL

Geologic, Seismic and Fault Hazards Assessment Report, Proposed Kindergarten Building Addition, San Juan Elementary School, 100 Nyland Drive, San Juan Bautista, California," prepared by D & M Consulting Engineers, Inc., dated November 12, 2002.

Fault Location Investigation, San Juan Junior High School Additions, San Juan Bautista, California, prepared by Cleary Consultants, Inc., dated April 30, 1987.

01-105532

GEOLOGIC, SEISMIC AND FAULT HAZARDS ASSESSMENT REPORT
PROPOSED KINDERGARTEN BUILDING ADDITION
SAN JUAN ELEMENTARY SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

PROJECT No. 0002725

D&M CONSULTING ENGINEERS, INC.
Geotechnical/Environmental/Materials Testing
A URS CORPORATION COMPANY

01-105532

GEOLOGIC, SEISMIC AND FAULT HAZARDS ASSESSMENT REPORT
PROPOSED KINDERGARTEN BUILDING ADDITION
SAN JUAN ELEMENTARY SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

PROJECT No. 0002725

Prepared For: Aromas-San Juan Unified School District
c/o Kasavan Architects
60 West Market Street, Suite 300
Salinas, California 93901

Attention: Mr. Thomas J. Cravens

November 15, 2002

November 15, 2002
Project No.: 0002725

Aromas-San Juan Unified School District
c/o Kasavan Architects
60 West Market Street, Suite 300
Salinas, California 93901

Attention: Mr. Thomas J. Cravens

Subject: Geologic, Seismic and Fault Hazards Assessment, Proposed Kindergarten Building Addition, San Juan Elementary School, 100 Nyland Drive, San Juan Bautista, California

Ladies and Gentlemen:

D&M/Terratech is pleased to submit our combined Geologic, Seismic and Fault Hazards Assessment report for the proposed addition to the kindergarten building at San Juan Elementary School site in San Juan Bautista.

This investigation involved research and review of existing geologic and seismic documents, interpretation of aerial photographs, subsurface exploration by means of both drilling and trenching, and laboratory testing of soil samples. The investigation was undertaken at the same time as the project geotechnical study, which will be presented as a separate report. The most significant findings from our hazard assessment are briefly summarized as follows:

- The site is underlain by several hundred feet of dense predominantly alluvial sand, silt, and gravel. These alluvial deposits rest on older sedimentary rock with granitic and metamorphic basement rock at greater depths.

- Groundwater was measured at 28-feet below the ground surface but is expected to fluctuate seasonally. We estimate that the high groundwater level could be as shallow as 18 feet deep.

- The San Andreas fault passes within about 300 feet of the project site. Exploratory trenching of an adjacent private lot approximately 90 feet east of the building site did not reveal evidence of subsidiary faulting, shear zones, offsets, folding, or other ground deformation related to faults or liquefaction within the depth of the trench. In spite of the proximity of the San Andreas fault, we consider the hazard due to fault rupture, fault creep, or other earthquake ground disturbance to be low.

12 Thomas Owens Way Monterey, California 93940 831 372 3716 Tel 831 372 7481 Fax
3194 De La Cruz Blvd., Suite 19 Santa Clara, California 95054 408 297 6969 Tel 408 297 7716 Fax
1500 Graham Hill Road, Unit B Santa Cruz, California 95060 831 458 4383 Tel 831 458 4388 Fax

- The San Andreas fault and related faults of the San Andreas system dominate the seismic hazard of the site and surrounding areas. A major earthquake on one of the nearby faults is expected to cause intense ground shaking at the site. We estimate that the peak horizontal ground acceleration resulting from an Upper-Bound Earthquake (UBE) event having a 10% chance of occurrence during a 100-year period will be 0.74g. We estimate the peak horizontal ground acceleration from a Design-Basis Earthquake (DBE) having a 10% chance of occurrence during a 50-year interval will be 0.63g. Response spectra for both UBE and DBE events have been provided for seismic design of the proposed building addition.

- The site was found to have a low potential for liquefaction-related hazards due to the relatively dense alluvium encountered beneath the design groundwater level.

- The hazard due to the proposed improvements as a result of landsliding is considered to be negligible.

- There is a low to moderate hazard posed by expansive soils and mitigation measures will be provided in the geotechnical report.

- The Kindergarten Building Addition site is outside of the 100-year flood inundation zone but may experience flooding of less than one-foot in depth with a 100-year event.

- The western portion of the San Juan Elementary School site is within the 100-year flood inundation zone. This will need to be considered in future projects at the site.

We appreciate the opportunity of providing our services to you on this project. We trust that this report meets your needs at this time. If you have any questions concerning the information presented, please contact our Santa Clara office for assistance.

Sincerely,
D&M CONSULTING ENGINEERS, INC./TERRATECH
A URS CORPORATION COMPANY

Mark R. Petersen

CERTIFIED ENGINEERING GEOLOGIST
MARK R. PETERSEN
No. EG1332
Exp. 10/31/04
STATE OF CALIFORNIA

Mark R. Petersen CEG 1332
Consulting Engineering Geologist

Gregory J. Ruf

Gregory J. Ruf, P. E.
President/Principal Engineer

cc: Addressee (6)

GEOLOGIC, SEISMIC AND FAULT HAZARDS ASSESSMENT REPORT
PROPOSED KINDERGARTEN BUILDING ADDITION
SAN JUAN ELEMENTARY SCHOOL
100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

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100 NYLAND DRIVE
SAN JUAN BAUTISTA, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of a combined geologic, seismic and fault hazards assessment performed for a proposed building addition to an existing kindergarten building at the San Juan Elementary School in San Juan Bautista, California. San Juan Elementary School is located in southeast San Juan Bautista at 100 Nyland Drive, east of The Alameda and north of Highway 156 as shown on Figure 1 – Location Map. The project site lies at latitude 36.8414°N and longitude 121.5300°W.

1.1 PROJECT DESCRIPTION

The proposed addition to the existing kindergarten building is to be a 1,400 square-foot, single-story, wood-frame structure with slab-on-grade floor. Other project improvements will include reconfiguration of the parking lot immediately southwest of the kindergarten building, reconfiguration and expansion of the parking lot south of the gymnasium (Building H), landscaping, and removal or relocation of an existing modular classroom. Kasavan Architects, the project architect, has provided a site plan showing the locations of the proposed improvements. This drawing has been used to prepare Figure 2, Site Plan, which shows the locations of the exploratory boring and fault trench made for this investigation.

Although no preliminary building loads are available, we expect that foundation loads will be relatively low, consistent with the proposed single-story wood-frame construction. The site is relatively level and only minor grading for the building pad and parking lots is expected with cuts and fills not likely to exceed 4 feet.

1.2 PURPOSE AND SCOPE

The purpose of this combined geologic, seismic and fault hazards assessment was to identify and evaluate geologic and seismic hazards that could potentially impact the proposed project and to provide a basis for developing hazard mitigation, should any be needed. A geotechnical investigation, being conducted at the same time as this geologic, seismic and fault hazards investigation, will be presented in a separate report.

The site is within a Sate of California Special Studies Zone (Alquist-Priolo Earthquake Studies Zone) and lies about 300 feet southeast of the mapped trace of the San Andreas fault. To address particular concerns due to the proximity of the San Andreas fault, and to meet State requirements for public school construction, our investigation included a fault study. The scope for our combined geologic, seismic and fault hazards assessment consisted of the tasks listed below.

- Review of available geologic and seismic literature relevant to the site including published mapping;

- Performance of a limited site reconnaissance and review of aerial photographs pertinent to the site for geomorphic evidence of faulting, ground movement, or other geologic hazards (aerial photographs used in this study are identified in References);

- Exploration of subsurface soil and groundwater conditions by means of a 40-foot deep hollow stem auger boring;

- Testing of subsurface soils in-situ and in the laboratory to measure engineering properties pertinent to liquefaction analysis;

- Exploration of near-surface soils by means of a 192-foot-long trench excavated on adjacent private land to evaluate the hazard posed by fault rupture, ground cracking, or other seismic ground deformation;

- Estimation of the Upper-Bound Earthquake (UBE) and Design Basis Earthquake (DBE) ground motions, response spectra, and seismic design parameters in light of the current understanding of the regional seismic framework;

- Calculation of the potential for liquefaction and related ground effects; and

- Preparation of this report to summarize our findings, conclusions and recommendations.

2.0 SITE AND GEOLOGIC CONDITIONS

2.1 SITE DESCRIPTION

The school site is situated at the southeast edge of San Juan Bautista and lies at an elevation of about 208 feet MSL near the western margin of San Juan Valley. The San Benito River, roughly 1-3/4 miles to the north, drains the San Juan Valley, flowing northward to join the Pajaro River. The foothills of Gabilan Range rise from the valley about one-quarter mile southwest of the school.

The San Juan Elementary School site is bounded on the southwest by The Alameda and a portion of Nyland Drive, on the southeast by Nyland Drive, and to the east and northeast by the San Benito County Line. A tributary to San Juan Creek is located along the northern limits of the site.

The site of the kindergarten addition (Photo 1, Appendix A) is essentially level as are the adjacent school grounds. Paved walkways, playgrounds and lawn presently occupy the building addition site. Just beyond the northeast boundary of the school property is a low, generally northwest-trending descending scarp that represents the main trace of the San Andreas fault (Photo 2, Appendix A). The geomorphic expression of the San Andreas fault across the San Juan Valley at San Juan Bautista is apparent on stereo-paired aerial photographs and is clearly shown by the 3-D rendering of the topography shown on Figure 3 (vertical exaggeration: 8X). At its nearest approach to the kindergarten building addition site, the top of the scarp lies just over 200 feet to the northeast. In the immediate vicinity of the project, the scarp falls approximately 15 to 20 feet at gradients ranging from 4 to 1 (Horizontal to Vertical) to as steep as 2.7 to 1. At the toe of the scarp is a subtle linear depression that is largely unimproved, poorly drained, and covered by a dense growth of brush and trees (Photo 2, Appendix A). Topographic expression and vegetation both strongly suggest the depression is a sag pond along the San Andreas fault.

2.2 GEOLOGIC SETTING

San Juan Bautista lies within the central section of the Coast Ranges physiographic province of California. This province consist of mountain ranges of moderate elevation extending some 600 miles northwest along the California coastline from the Transverse Ranges in the south to beyond the California-Oregon border. Ridges and valleys within the province, such as San Juan Valley and the Gabilan Range, are primarily controlled by geologic structure and follow the general northwest trend of regional faults or folds.

The distribution of geologic materials in the vicinity of the site is shown on Figure 4 – Geologic Map. San Juan Elementary School is underlain by alluvium of the San Juan Valley, Tertiary sedimentary rocks, and, at depth, granitic and metamorphic basement rock of the Salinian Block. Allen (1946) described the alluvium at the site as non-marine terrace deposits derived largely from granitic rock. The thickness of alluvium beneath the site exceeds the 40-foot maximum depth of our drill hole. Judging from the proximity of the Gabilan Range foothills, depth to rock is estimated to be on the order of 100 to 300 feet below ground surface. Bedrock is expected to consist of Oligocene-age marine siltstone, claystone and sandstone of the San Lorenzo Formation (Dibblee and others, 1979).

The active San Andreas fault lies approximately 300 feet northeast of the building site and is probably coincident with the toe of the low, northwest-trending linear scarp (Photo 2, Appendix A; Figure 3). The San Andreas fault separates the granitic and metamorphic basement rock of the Salinian Block on the southwest from sedimentary basement rock of the Mesozoic Franciscan Assemblage to the northeast. The San Andreas fault is a right-lateral, strike-slip fault extending northwest from the Gulf of California to Cape Mendocino. The San Andreas fault and related faults of the San Andreas fault system form the boundary between the North American and Pacific tectonic plates and dominate the seismic hazard of the region.

2.3 SUBSURFACE CONDITIONS

Subsurface conditions were explored by a 41-1/2 foot deep hollow-stem auger boring and a 192-foot-long backhoe trench. The locations of the boring and trench are shown on Figure 2 – Site Plan. Samples taken during drilling were recovered at select depths for visual inspection and laboratory testing. The samples were taken using a 2-inch diameter O.D. standard penetration test (SPT) sampler without sleeves and a 2.5-inch O.D. split-spoon sampler fitted with brass sleeves. The samplers were driven into the soil using a 140-pound hammer falling 30 inches. The soils were classified using the Unified Soil Classification System. The detailed soil log from boring B-1 is presented in Appendix B. The trench log is presented as Plate 1.

Within the maximum depth of our exploration, the building site is underlain by alluvial sand containing variable amounts silt, gravel and clay. Shallow soils encountered during trenching required the use of rock teeth on the 30-inch backhoe bucket due to the dense state of the deposits. Near-surface soils exhibit a moderately well-developed soil profile and clay has become concentrated in some soil horizons (particularly B_t and B_{tk} horizons) within the upper 5 to 7 feet. Although no laboratory age dating was conducted, moderately developed soil profile, rubification of soils and the presence of stage 1 carbonate morphology strongly suggest pre-Holocene deposits. Aside from these shallow clay-rich horizons and a 9-foot-thick clay layer below a depth of 21 feet, most of the alluvium consists of dense to very dense granular deposits within the depth of exploration. The trench exposure reveal that near-surface deposits consist of interbedded fluvial sand, silt and granitic gravel. A geologic cross-section showing inferred subsurface conditions beneath the site is presented as Figure 6.

Groundwater was encountered at a depth of 28 feet at the time of our exploratory drilling (October 2002). The depth to groundwater can be expected to fluctuate both seasonally and from year to year. Considering the expected seasonal ponding at the bottom of the nearby scarp, the high groundwater level at 18 feet deep was conservatively assumed for our liquefaction analysis.

3.0 GEOLOGIC HAZARDS

3.1 FAULTING AND SEISMICITY

3.1.1 Regional Seismicity and Faulting

The school site is located in seismically active central California. The seismicity of the area is dominated by the San Andreas fault and related faults of the San Andreas fault system. Numerous large and destructive earthquakes have occurred during historic times and attest to the seismicity of the area. The historic San Juan Bautista Mission, 0.4 miles northwest of the school, was severely damaged as a result of earthquakes on the San Andreas fault in October 1800 and April 1906.

A computer search of historic earthquakes was made using the computer program EQSEARCH (Blake, 1996) to identify earthquakes that have occurred in the vicinity of the site. The search included: (1) earthquakes of magnitude M5.0 or greater within 100 kilometer (62 miles) of the site and (2) earthquakes of magnitude M6.0 or greater within 161 km (100 miles) that have occurred during the 201-year interval between the 1800 and 2000. The records indicate that during this period, 76 earthquakes of estimated magnitude M5.0 or greater have occurred within 62 miles of the site and 21 earthquakes of magnitude M6.0 or greater have occurred within 100 miles. A list of these earthquakes is presented in Appendix C.

Although the epicenter of the 1906 San Francisco Earthquake is thought to have been located 80 miles northwest of the site, ground rupture reportedly extended southward to within ½ miles of San Juan Bautista (Lawson, 1908, pg 38). Right-lateral offset of 4-feet was reported 3 miles northwest of San Juan Bautista and 3-1/2 feet of offset was measured between railroad bridge abutments at nearby Pajaro Gap. San Juan Bautista lies at the transition between locked and actively creeping sections of the San Andreas fault. On-going co-seismic displacement (creep) has offset roads, fences, and other cultural features in the vicinity of the school. Fault creep has been monitored since the 1960s on the Nyland Ranch Array, adjacent the school property. A creep rate of 9 mm/yr has been measured on this array over the 35 years between 1967 and 2002 with short-term rates ranging from 7 mm/yr to 12 mm/yr (http://www.geol.ucsb.edu/~geodesy/nail_lines/X00070_NYLAND_RANCH_NL.html).

While the San Andreas fault dominates the seismic hazard at the site due to its proximity, activity and potential to generate large earthquakes, many nearby regional faults are also capable of causing strong ground shaking and contribute to the seismic hazard. A regional fault map is shown on Figure 7. Major regional active faults, including their distance from the site, seismic source type, average slip rate, and maximum moment magnitude are summarized in Table 1 – Significant Active Faults.

TABLE 1
SIGNIFICANT ACTIVE FAULTS

Fault Name	Seismic Source Type[1]	Closest Distance to Site (km)	Moment Magnitude of Maximum Earthquake (Mw)[1]	Slip Rate (Mm/Yr)[1]
San Andreas (Creeping)	A	0	6.5[3]	34
San Andreas (1906)[2]	A	3	7.9	24
Zayante-Vergeles	B	4	6.8	0.1
Sargent	B	7	6.8	3
Calaveras (South)	B	10	6.2	15
Quien Sabe	B	17	6.5	1
San Andreas (Santa Cruz Mtns)	A	19	7.0	14
Rinconada	B	27	7.3	1
Monterey Bay - Tularcitos	B	39	7.1	0.5

1 From Working Group (1996)

2 Includes Pajaro, Santa Cruz Mtn, Peninsula, and North Coast Segments

3 Creep releases most strain along this segment. A possible M>6.0 is assumed as background but not from a discrete source.

3.1.2 Surface Faulting

As shown on Figure 5, the school site lies within an Alquist-Priolo earthquake fault zone. As previously discussed, the active trace of the San Andreas fault has been mapped about 300 northeast of the proposed building addition site. While no surface features suggestive of past faulting or ground deformation of the site were observed in the field or identified by aerial photograph review, a trenching study was performed to confirm the absence of subsidiary traces of the San Andreas fault beneath the proposed building addition site and evaluate the hazard posed by earthquake related ground deformation. Since trenching at the existing kindergarten building was complicated by the presence of underground utilities, pavements, concrete hardscape, and other improvements (Photo 1), the trench was excavated on adjacent private land as shown on Figure 2 and Photo 3. Subsurface conditions adjacent the school property were explored by means of a 192-foot long trench ranging from 7 to 8 feet in depth. The trench extended more than 50 feet beyond the projection of the building addition toward the mapped trace of the San Andreas fault. The trench was continued as far to the southwest as possible given the constraints imposed by a driveway (sole access to an occupied private residence) and underground utilities.

The trench sidewalls were cleaned, examined, and logged by a California Certified Engineering Geologist who prepared the trench log attached as Plate 1. The trench exposed a moderately developed soil profile exhibiting A, Bt, Bk, and C soil horizons. These horizons appeared laterally continuous and undeformed throughout the length of the trench. The weak to medium soil structure in the soil horizons is attributed to the paucity of clay in the soil. Stage 1 carbonate morphology was present (Bk horizon) throughout the entire trench. A locally discontinuous, near-horizontal layer of cobble-size granitic clasts (labeled "stones" on the trench log, Plate 1) was found to extend a distance of at least 114 feet within the C horizon alluvium between stations 0+71 and 1+85 (Photo 4). Clearly defined, near-horizontal lenses of coarse sand and gravel could be clearly traced undisturbed throughout most of the trench length. No fossil fissures, clastic dikes, soil tongues, or other features suggestive of ground disturbance due to lateral spreading or sand boils was observed.

Considering the absence of observed shear zones, offset, folding, or tilting of exposed soil horizons and alluvial beds, it is our opinion that, in spite of its proximity to the San Andreas fault, the site is not particularly prone to surface rupture, creep, or earthquake related ground deformation.

3.1.3 Strong Ground Motion

This site is located within California Building Code Seismic Zone 4. Seismic parameters for design based on the Static Force Procedure are as follows:

Seismic Zone Factor, Z:	0.4
Soil Profile Type:	S_D
Seismic Coefficient, C_a:	0.66
Seismic Coefficient, C_v:	1.28
Near-Source Factor, N_a:	1.5
Near Source Factor, N_v:	2.0

The U.S. Geological Survey (USGS) has developed a probabilistic seismic hazard model based on the current understanding of regional tectonics (Frankel and others, 1996). The results of this work are now available over the internet (http://eqint.cr.usgs.gov/eq/html/custom.shtml) with seismic response provided for "firm rock" sites at various hazard levels. In this model, "firm rock" is considered to be defined as an earth material intermediate between soil types S_B and S_C with a shear-wave velocity of 760 m/s averaged over the upper 30 meters of depth. The "firm rock" ground acceleration values calculated by the USGS at the site for a 10% in 50 year event (Design-Basis Earthquake - DBE) and 10% in 100 year event (Upper-Bound Earthquake - UBE) were adjusted to account for the deep, predominantly cohesionless alluvium overlying the rock. Surface ground motions were estimated using the methods proposed by Seed and others (2001) and the calculated Peak Horizontal Ground Accelerations are as follows:

Hazard Level	Event Return Period (years)	Peak Horizontal Acceleration (g) – Firm Rock	Peak Horizontal Acceleration (g) – Ground Surface
10% in 50 years (DBE)	475	0.77	0.63
10% in 100 years (UBE)	949	1.01	0.74

Response spectra for the site were also developed for the DBE and UBE earthquake events using the procedure proposed by Seed and others (2001). These spectra are shown in Figure 9.

3.2 LIQUEFACTION

Liquefaction is a phenomenon whereby the shear strength of saturated, loose, cohesionless soils diminishes as a result of increasing pore pressures generated by the repeated cycles of seismic shaking. The effects of liquefaction may include reduced soil support beneath foundations, lateral spreading, and localized settlement of the ground surface.

The liquefaction potential of the site was evaluated using the computer program LIQUEFY2 (ver. 1.50) by Thomas F. Blake, Computer Services & Software. Input parameters included:

rd factor based on:	NCEER (1997) rd factor
Rod length correction:	3.0 feet of stick up
Magnitude Scaling Factor (MSF):	Idriss (1997)
calculated water depth:	15 feet
Earthquake magnitude:	7.9
Acceleration:	0.74g
Surcharge:	none
Sampler correction:	1.0
Borehole correction:	1.15
Hammer correction:	0.8

The calculations indicate that the relatively dense granular alluvium underlying the site will not liquefy even under the conservative combination of high groundwater and upper-bound earthquake ground motions.

The results of these calculations are further supported by the apparent absence of evidence for liquefaction-related ground disturbance in our exploratory trench, performance of the historic Nyland Adobe site and adjacent scarp (300 feet southeast of the school addition site), and the absence of reported liquefaction features in this area during historic earthquakes (Youd and Hoose, 1978; Holtzer, 1998). The alluvial soils underlying the site are very likely pre-Holocene and are likely to have a higher resistance to liquefaction than the calculations would suggest (Youd and Idriss, 1997, pg. 32).

3.3 SLOPE STABILITY AND EROSION

The proposed building addition site and surrounding school grounds are essentially level. The top of the low scarp along the San Andreas fault is located more than 200 feet to the northeast. Considering the absence of nearby slopes, the hazard posed by deep-seated or shallow landsliding is considered to be negligible.

The level area surrounding the proposed building will be landscaped or protected by pavements or slabs-on-grade. Consequently, the site is considered to have a low potential for erosion.

3.4 FLOODING, TSUNAMIS AND SEICHES

The school is located nearly 2 miles from the San Benito River. There is a tributary to the San Benito River located just north of the school property. The site of the proposed Kindergarten building addition is outside of the 100-year flood inundation zone (FEMA, 1991). This portion of the school campus is within FEMA Zone X, which is within the 500-year flood zone, with an average flood depth of less than 1 foot associated with the 100-year flood event. Thus, flooding at the Kindergarten building is not considered to be a significant hazard. Nevertheless, surface drainage of the building site should be designed to discourage ponding of water during extended periods of precipitation. Although the Kindergarten building and the eastern portion of the school site are outside of the 100-year flood inundation zone, the western side of the site is mapped as being in Zone AE, as shown on the partial FEMA map included as Figure 8. . This area is subject to flooding, with flood elevations generally between elevations 205 and 206 feet (National Geodetic Vertical Datum of 1929) in the area of a few existing buildings.

Tsunamis are destructive waves triggered during earthquakes by displacement of the ocean floor or by coastal or underwater landslides. The kindergarten building addition site lies at an elevation of more than 200 feet above mean sea level and a distance of over 14 miles inland so the potential hazard posed by Tsunamis is considered to be negligible.

A seiche is a wave that occurs as a result of sloshing of an enclosed body of water during an earthquake. The potential hazard posed by seiche waves is negligible considering the relatively great distance to San Francisco Bay or the nearest lakes and reservoirs.

Failure of a reservoir resulting in the release of significant amounts of impounded water could cause widespread flooding in the surrounding lowlands. San Justo Reservoir is located approximately 4.9 miles southeast of the school site. Based on our review of the inundation map for dam breach at San Justo (U.S. Bureau of Reclamation, 1999), we find that the San Juan Elementary Campus is outside of the inundation zone. There are no other water storage facilities upslope or upstream from the school site.

3.5 EXPANSIVE SOILS

Near-surface soils encountered in our exploratory boring and trench generally consist of non-plastic silt and lean clay. These soils have a low potential for expansion as demonstrated by the low Plasticity Index of the soils. The low plasticity and rubification (reddening) of the clay-rich B_t horizon exposed in the exploratory trench suggests that much of the clay has weathered to Kaolinite and, consequently, the near-surface clays are not expected to be particularly expansive. Recommendation for site drainage, earthwork, and design of foundations and slabs are given in the companion geotechnical report for this project and will address this potential hazard. Prudent design of surface drainage and design of foundations can mitigate this potential hazard.

3.6 COMPRESSIBLE SOILS AND SETTLEMENT

The site is underlain by dense older alluvial deposits that are not prone to liquefaction. The relatively low anticipated loads imposed by the single-story wood-frame building addition are not expected to induce any significant compression of the underlying soils when they are supported on properly design foundations. Considering the absence of loose non-cohesive deposits underlying the site, significant seismic settlement is not likely to occur in the event of a strong earthquake.

3.7 VOLCANIC HAZARDS

There are no known Quaternary volcanoes in the vicinity of the site (Jennings, 1994). A major volcanic eruption from a distant volcanic sources, such as Mono Lake-Long Valley or Cascade Range volcanoes, poses a minor risk that more than 5 cm of ash will fall at the school site (http://www.usgs.gov/themes/map2.html).

4.0 LIMITATIONS

This report was prepared in accordance with the generally accepted standards of engineering geology that existed in San Benito County at the time the report was written. No other warranty, express or implied, is made. Note that changes in the standards of practice in the fields of geology and seismology, Code changes and new agency regulations will likely occur with time. In light of this, there is a practical limit to the usefulness of this report without critical professional review.

This report is intended for use only by the Aromas-San Juan School District and their consultants and only for the project described above, within a reasonable time from its issuance. Note that changes in the standards of practice in the field of engineering geology, changes in site conditions such as new excavations or fills, new agency regulations, or modifications to the proposed project are grounds for this report to be professionally reviewed. In light of this, there is a practical limit to the usefulness of this report without critical professional review. The maximum useful life of this document is considered to be three years, after which time the report should be reviewed for compliance with applicable regulations and the standard of practice. Any party other than the Aromas-San Juan School District or their architect, Kasavan Architects, wishing to use this report should notify D&M/Terratech of their intent. Based on the intended use of the report, D&M/Terratech may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release D&M/Terratech from any liability resulting from the use of this report by any unauthorized party.

The conclusions of this report are for the Kindergarten Building Addition site at San Juan Elementary School Site in San Juan Bautista, California, as described in this report and are based on information obtained from the following:

- Review of referenced aerial photographs;
- Review of referenced engineering geologic reports and geologic maps and reports;
- The observations of our Certified Engineering Geologist; and
- Subsurface exploration information obtained at the site.

While much of the information contained in this report is relevant to the school site in general, additional subsurface exploration consisting of geotechnical borings and trenching will be required for future projects at the site. The borings will be required to evaluate the liquefaction and expansion potential of the soils, and trenching will be needed to evaluate future building for the potential presence of faulting or fault related ground cracking associated with the San Andreas fault. The conclusions in this report are invalid if the report is used for adjacent or other properties.

The logs of the exploratory boring and trench do not provide a warranty as to the conditions that may exist beneath the entire site. The extent and nature of subsurface soil and groundwater variations may not become evident until construction begins. It is possible that variations in soil conditions and depth to groundwater could exist beyond the points of exploration that may require additional studies, consultation, and possible design revisions. Subsurface exploration of any site is necessarily confined to selected locations. Conditions may, and often do, vary between and around such locations. Should conditions different from those encountered in our exploration come to light during project development, additional exploration, testing and analysis may be necessary; changes in project design and construction may also be necessary. Any person concerned with this project who observes conditions or features of the site that are different from those described in this report should report them to D&M Consulting Engineers immediately for evaluation.

5.0 REFERENCES

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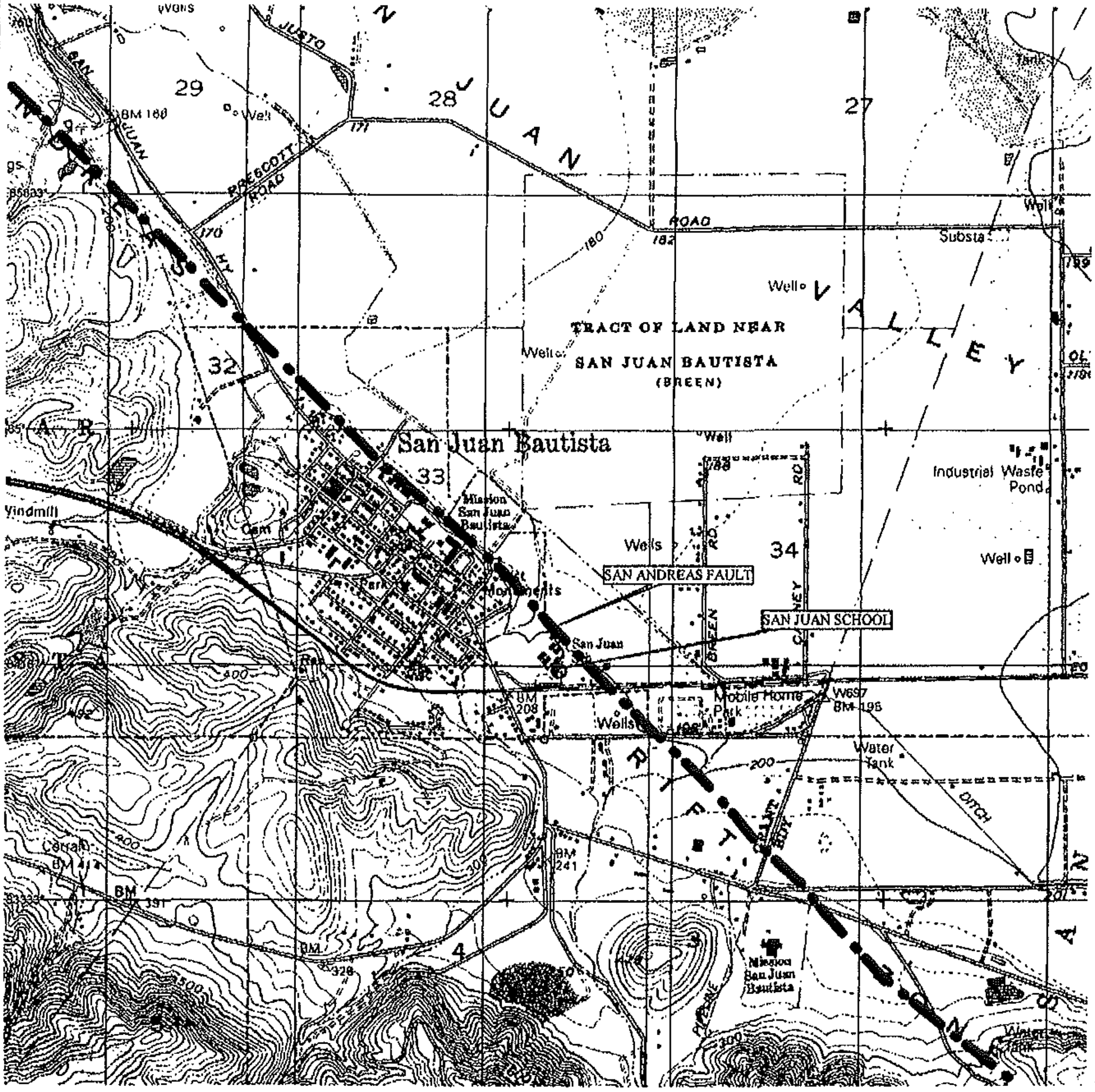
Youd, T.L., and Idriss, I.M. (ed), 1997, Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils, Technical Report NCEER-97-0022, 276 p.

Aerial Photographs

Date	Framcs	Source	Flown By	Scale	Type
9-21-97	16-124 &125	WAC	WAC	1:24,000	B/W
10-26-89	1-1	Unknown	Airflight Service	1:6,800	B/W
4/2/85	6-183&184	Unknown	WAC	1:31,680	B/W
4-12-80	279-137&138	USDA	WAC	1:40,000	B/W
5/8/73	1-3&4	USGS	Cal Aero Topo	1:10,000	Color
7/27/52	14-56GS-WL&57	USGS	Unknown	1:23,600	B/W
8/2/49	BUX-14F-2&3	USDA	Park Aerial	1:20,000	B/W
6/10/39	BUX 260-11&12	USDA	Fairchild Aerial Surveys	1:20,000	B/W



Latitude: 36.8413 North
Longitude: -121.5200 West

MAP REFERENCE: 3-D TopoQuads Copyright 1999
DeLorme Yarmouth, ME 04096
Source Data: USGS

N

SCALE: 1 = 24,000

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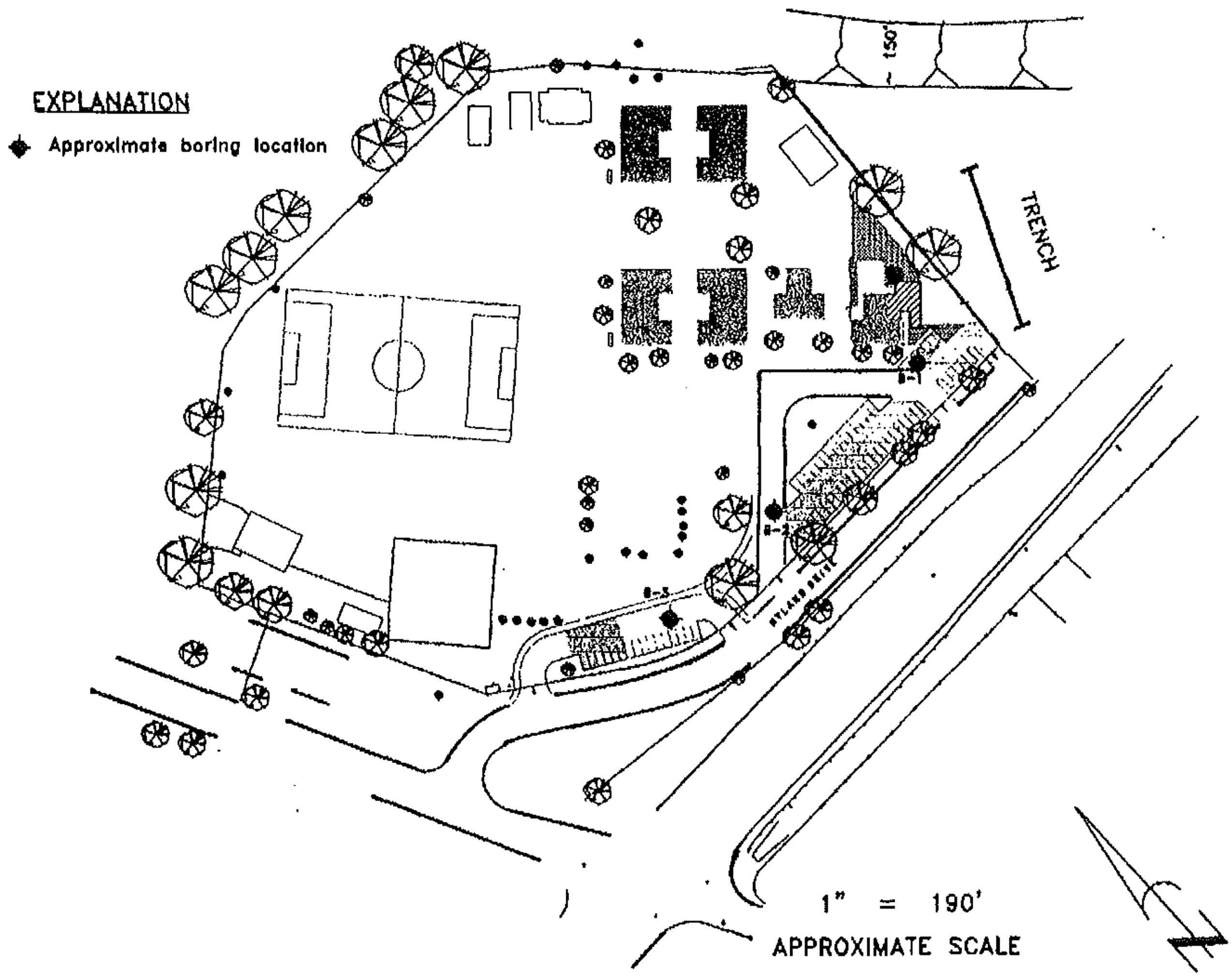
LOCATION MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

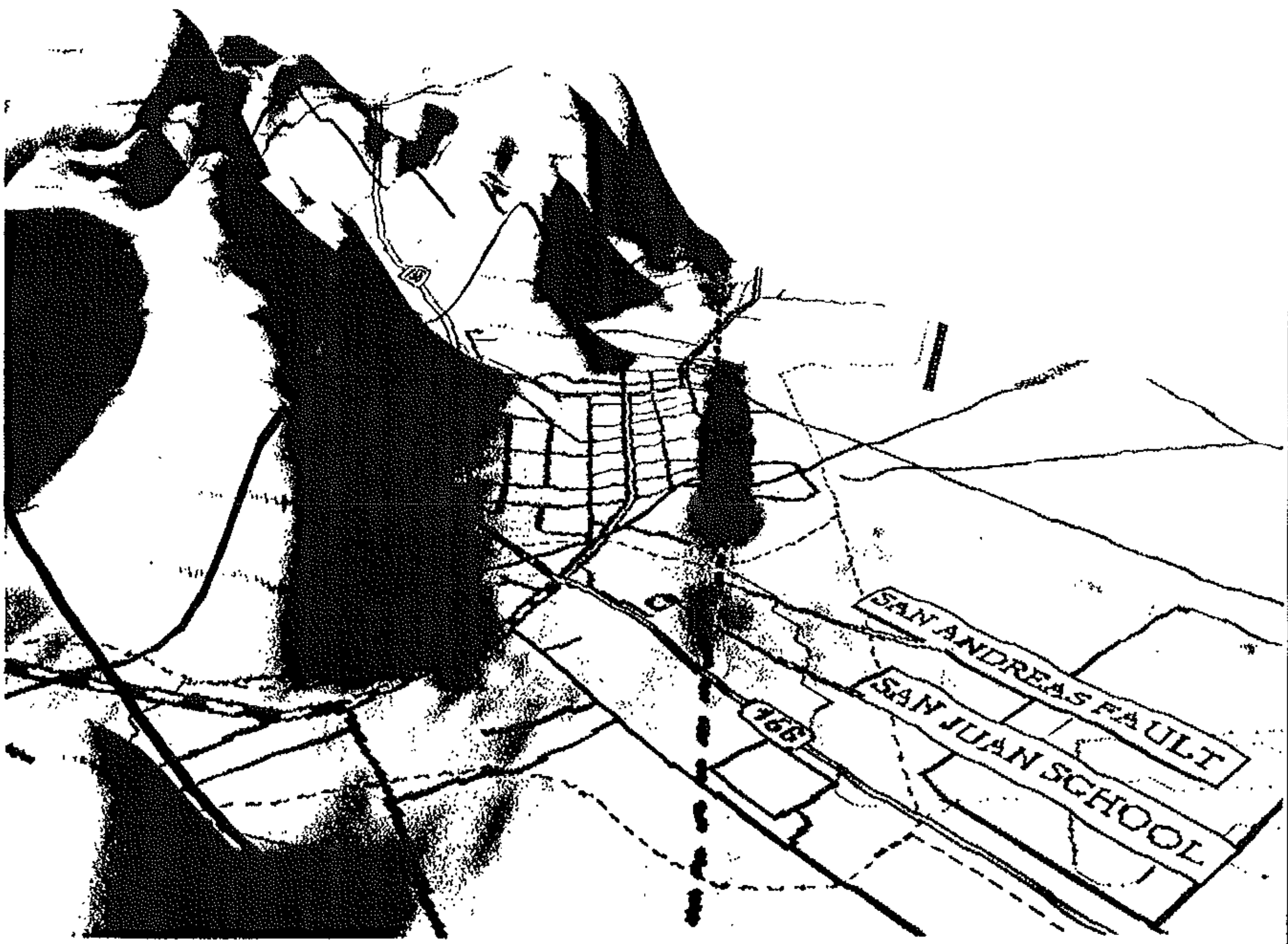
FIGURE
1
PROJECT
2725



1" = 200'
Approximate Scale
At 8-1/2" x 11"

Base drawing provided by Kasavan Architects, modified by D&M Consulting Engineers, Inc.

November 2002 D&M CONSULTING ENGINEERS, INC. A URS CORPORATION COMPANY	**SITE PLAN** **Proposed Kindergarten Building Addition** **San Juan Elementary School** **100 Nyland Drive** **San Juan Bautista, California**	FIGURE 2 PROJECT 2725



REFERENCE: 3-D TopoQuads Copyright 1999 DeLorme Yarmouth, ME 04096
Detail 12-7 Datum: NAD27

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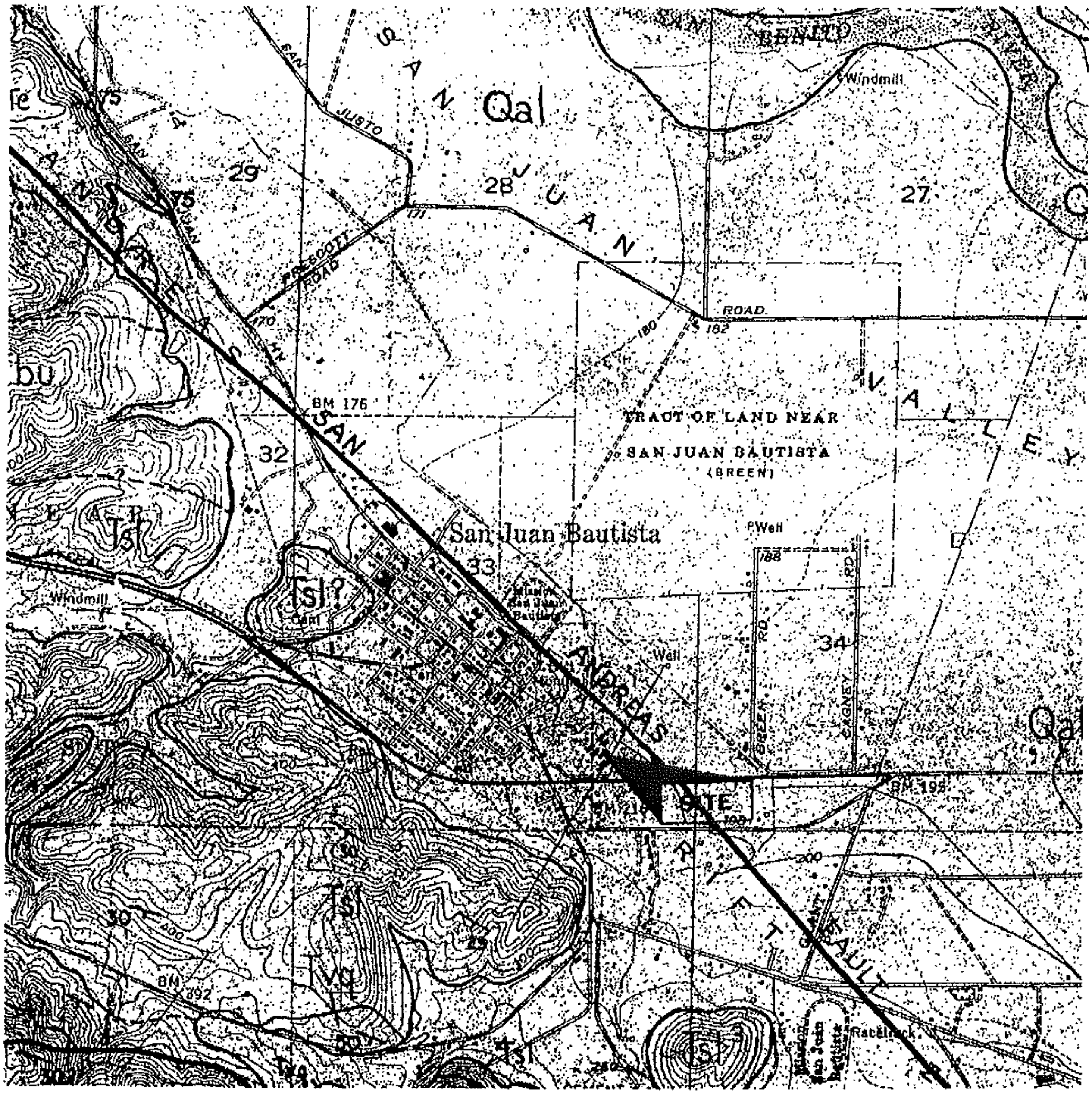
TOPOGRAPHIC SETTING

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
3
PROJECT
2725



Legend:

Qal = Alluvium.
Tsl = San Lorenzo Formation,
Marine Siltstone and Claystone, Minor Sandstone.

N

SCALE: 1 = 24,000

MAP REFERENCE: Preliminary Geologic Map of the San Juan Bautista Quadrangle, San Benito and Monterey Counties, California by Thomas W. Dibblee, Jr., Tor H. Nilsen, and Earl E. Brabb, 1979 USGS Open File 79-375

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D&M CONSULTING ENGINEERS, INC.
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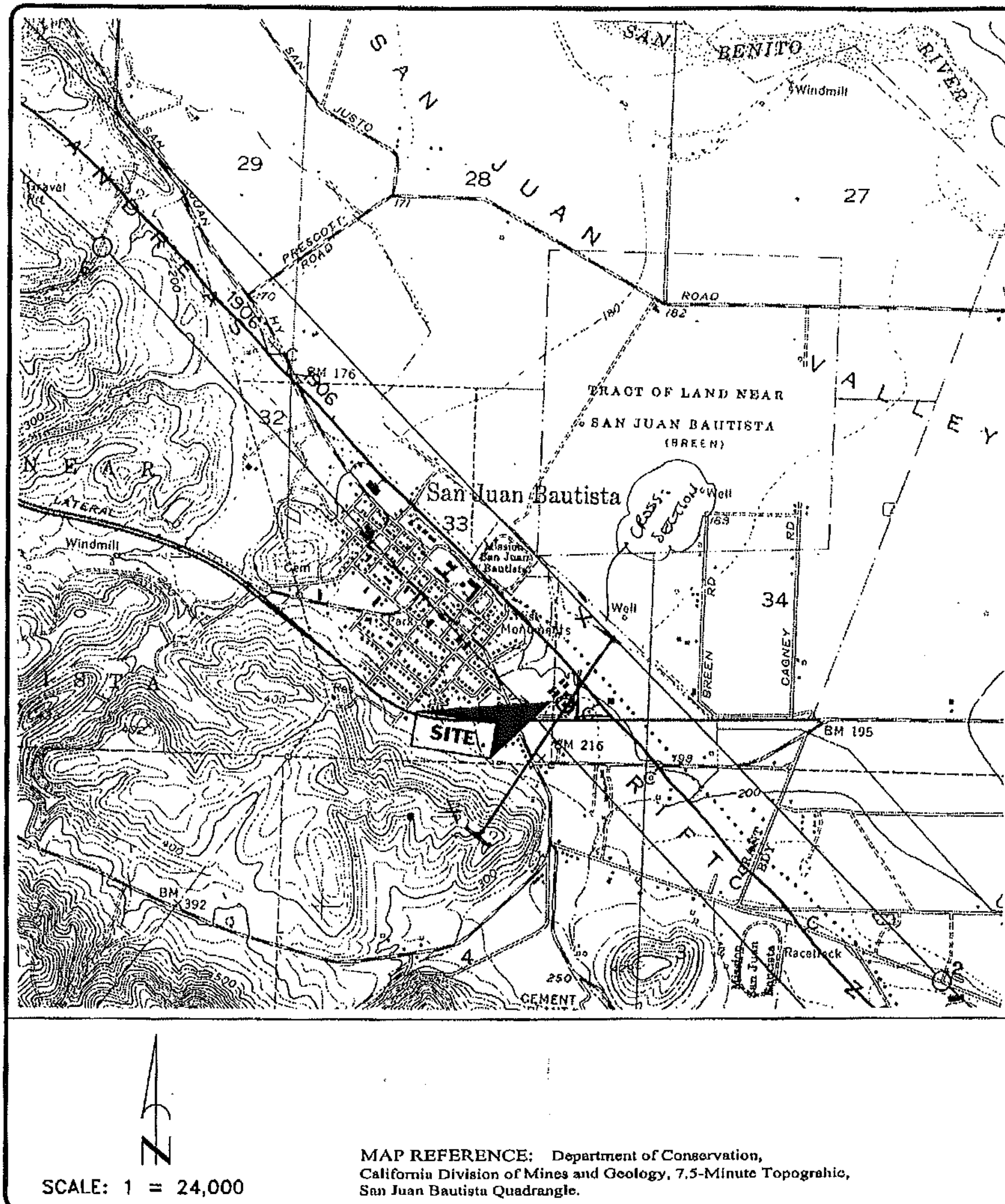
GEOLOGIC MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
4
PROJECT
2725



MAP REFERENCE: Department of Conservation, California Division of Mines and Geology, 7.5-Minute Topograhic, San Juan Bautista Quadrangle.

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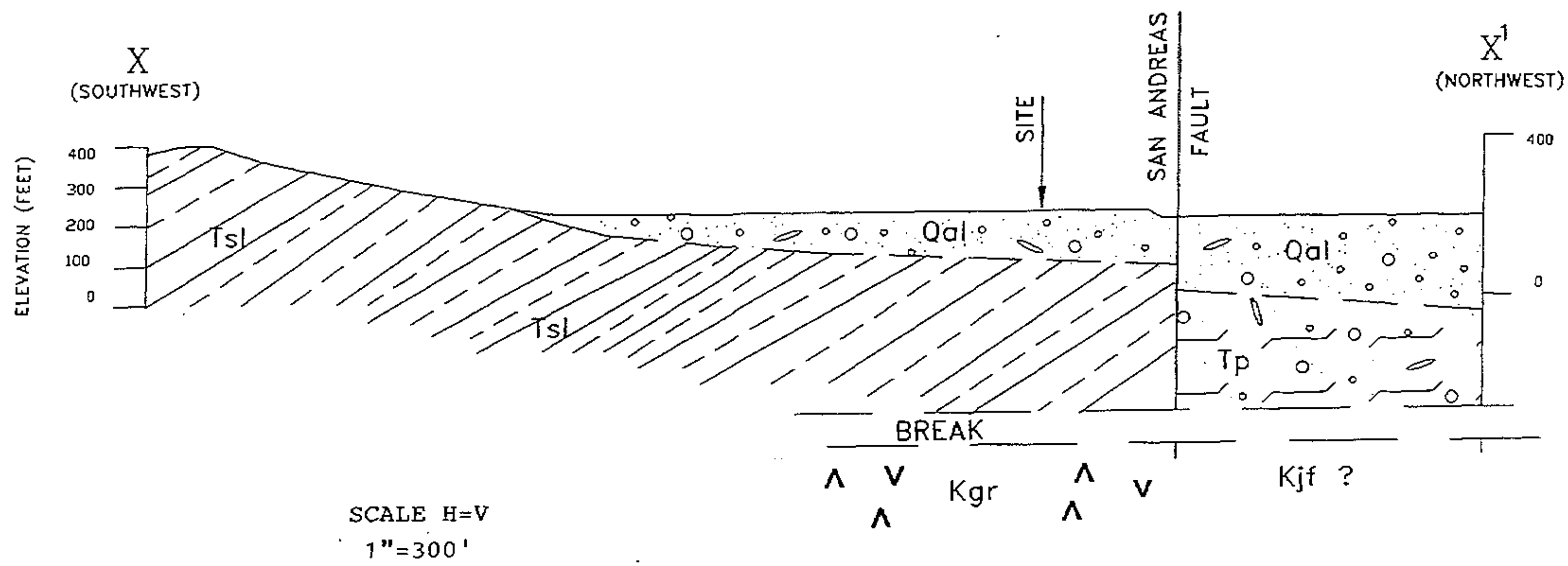
SPECIAL STUDIES ZONES
Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE 5
PROJECT 2725



UNITS

Qal — QUATERNARY ALLUVIUM; LARGELY RIVER TERRACE DEPOSIT (PLEISTOCENE ?)

Tp — PURISIMA FORMATION; POORLY CONSOLIDATED SANDS, SILTS, CLAYS AND GRAVELS, MARINE AND NON-MARINE (PLIOCENE)

Tsl — SAN LORENZO FORMATION; MARINE SILTSONE AND CLAYSTONE, MINOR SANDSTONE (OLIGOCENE ?)

Kgr — FRANCISCAN ASSEMBLAGE; GRAYWACKE, SILTSTONE, ALTERED MAFIC VOLCANIC WITH MINOR CHERT, LIMESTONE AND CONGLOMERATE (JURASSIC TO CRETACEOUS)

Kjf — GRANITIC ROCKS; PREDOMINANTLY GRANODIORITE, RANGING FROM GABRO TO GRANITE (CRETACEOUS)

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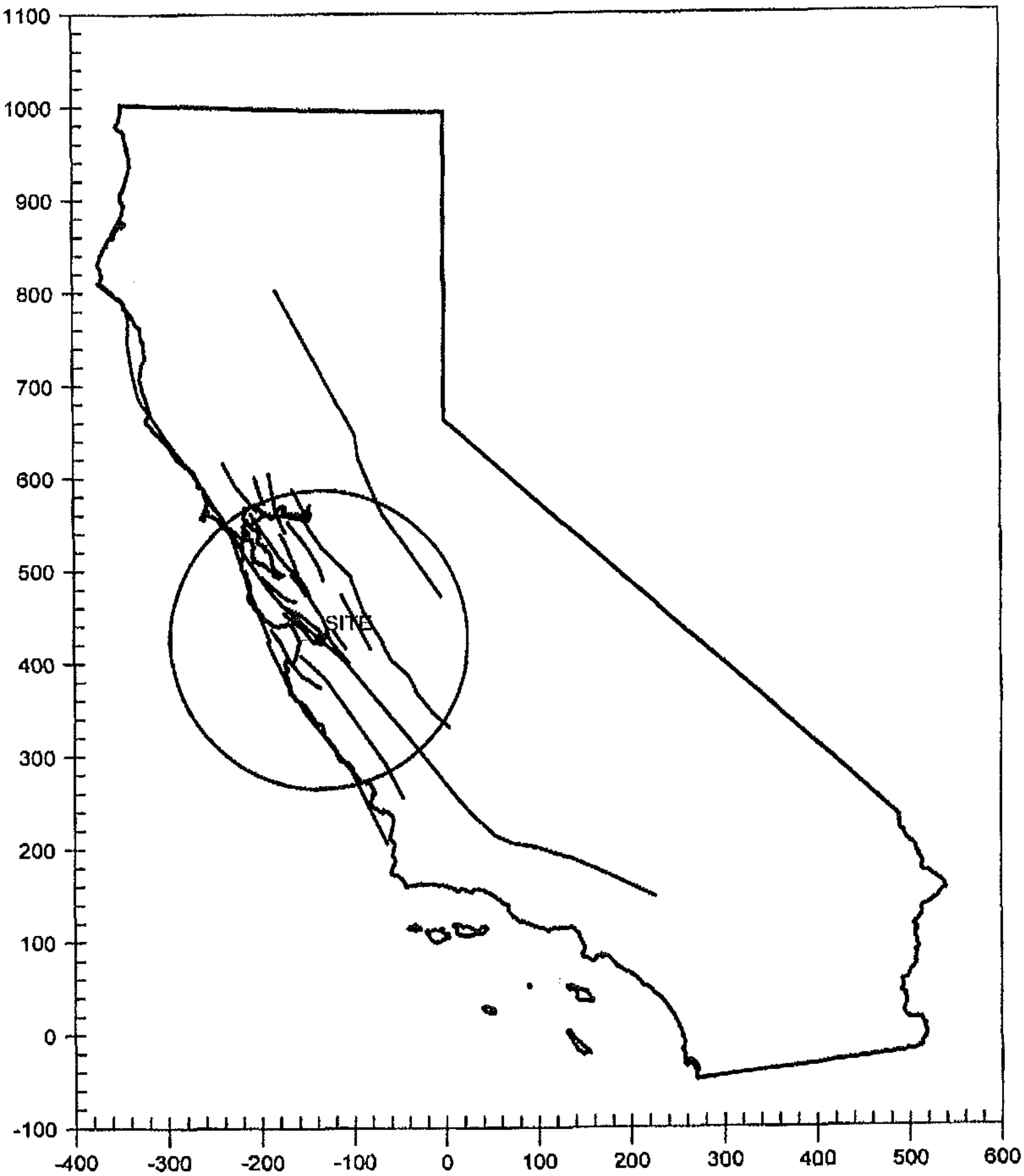
GEOLOGIC CROSS-SECTION
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

FIGURE
6
PROJECT
2725

CALIFORNIA FAULT MAP

San Juan School Kindergarden Addition



SOURCE: Thomas Blake Computer Services, EQSEARCH, April 2000.

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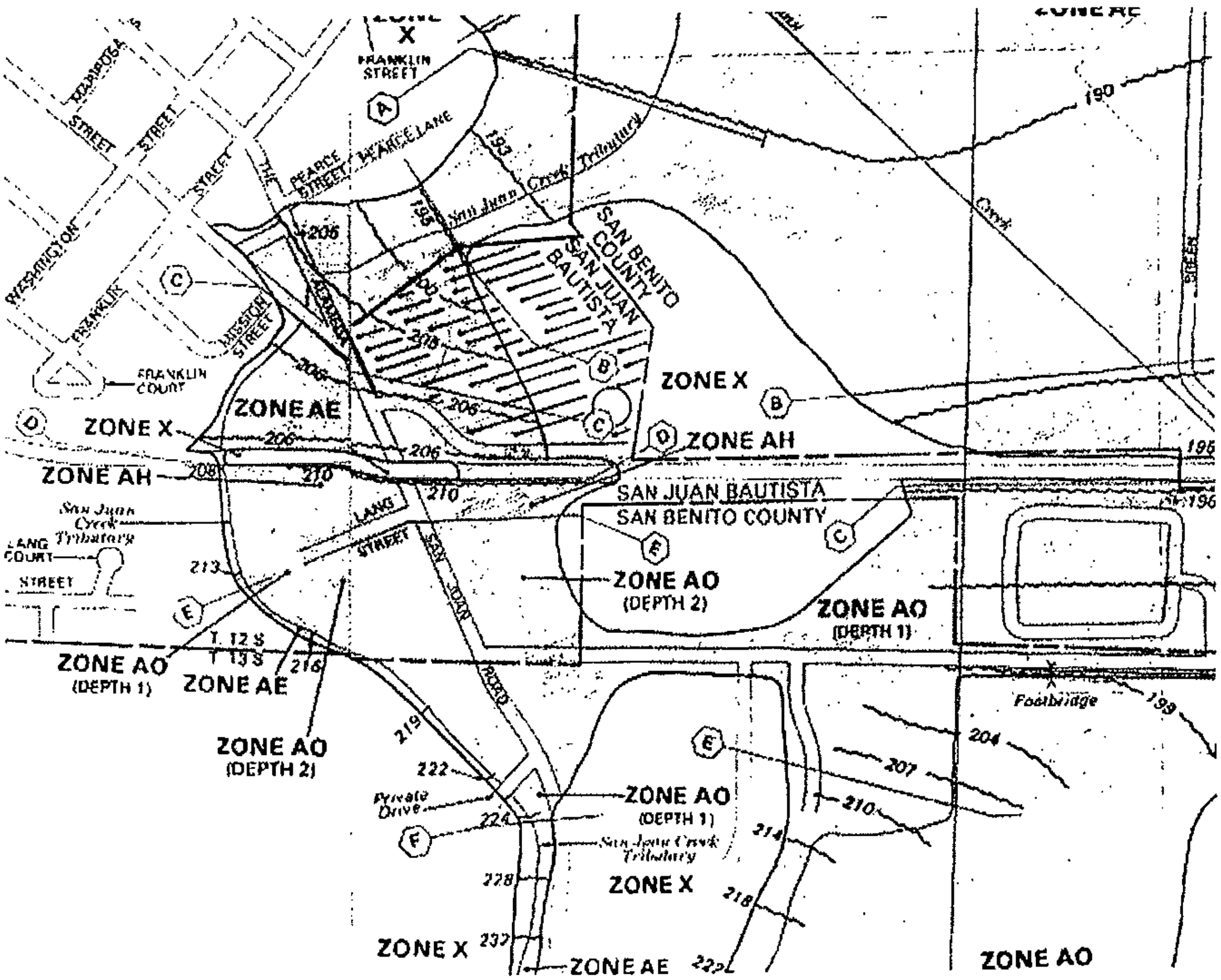
REGIONAL FAULT MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

FIGURE
7
PROJECT
2725



MAP REFERENCE: FIRM Flood Insurance Rate Map, San Benito County, California and Incorporated Areas, Map Number: 06069C0062 C, Effective Date: September 27, 1991.

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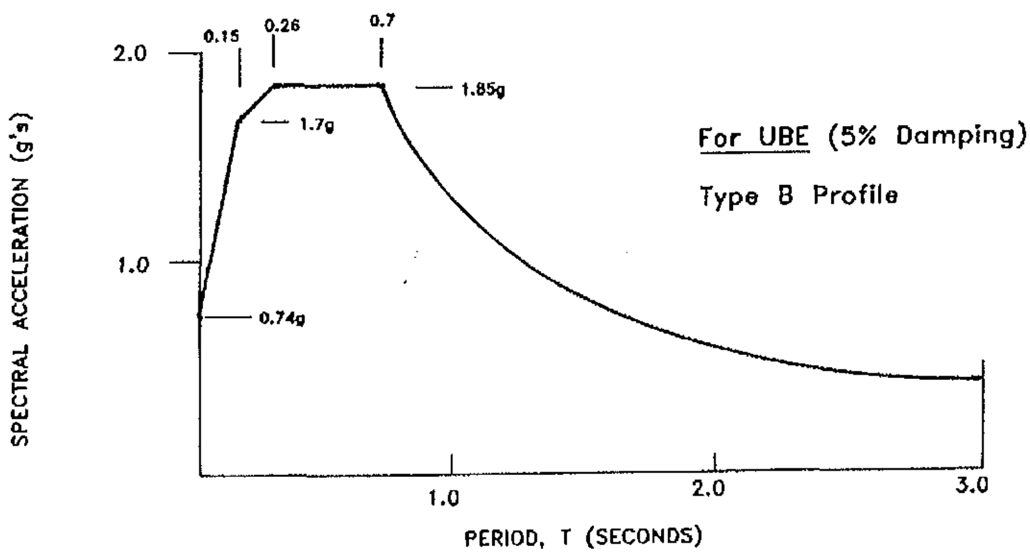
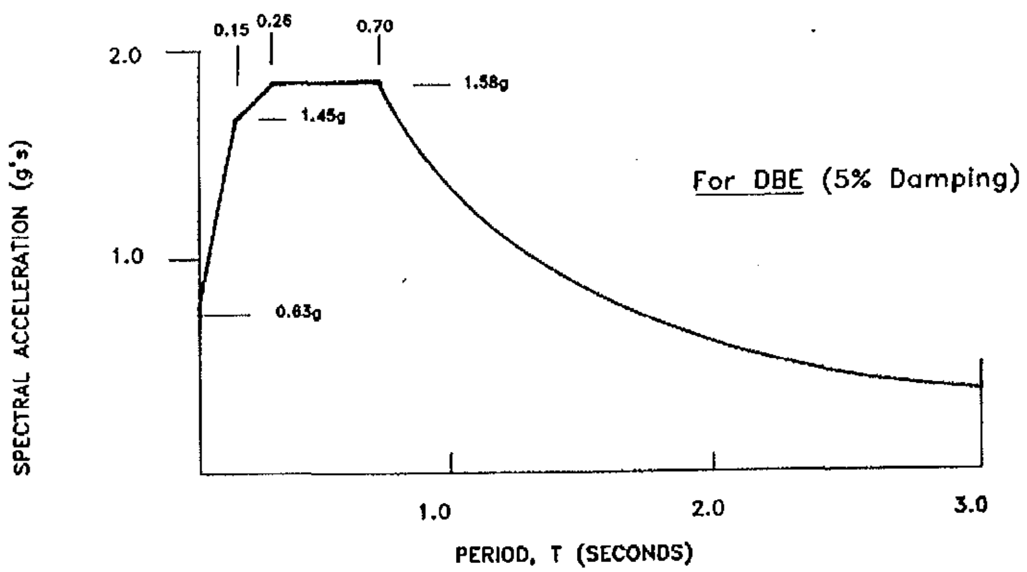
FEMA FLOOD INSURANCE RATE MAP

Proposed Kindergarten Building Addition
San Juan Elementary School
100 Nyland Drive
San Juan Bautista, California

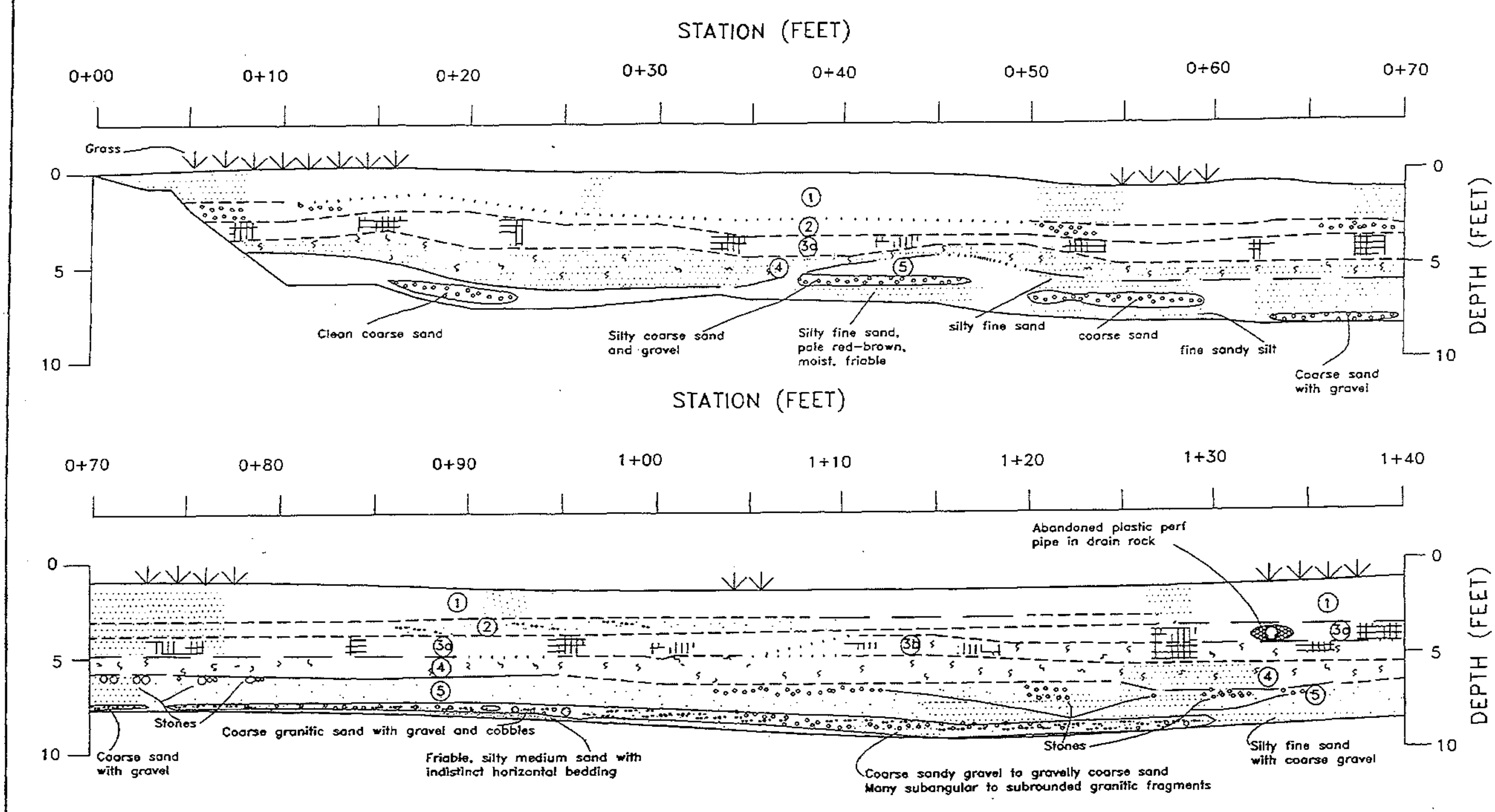
FIGURE
8
PROJECT
2725

Using approach proposed by Seed, R.H. and Others (2001) Response Spectra would be as follows:





NOVEMBER 2002 D&M CONSULTING ENGINEERS, INC. *A URS CORPORATION COMPANY*	RESPONSE SPECTRA SAN JUAN ELEMENTARY SCHOOL SAN JUAN BAUTISTA, CALIFORNIA	FIGURE 9 PROJECT 2725



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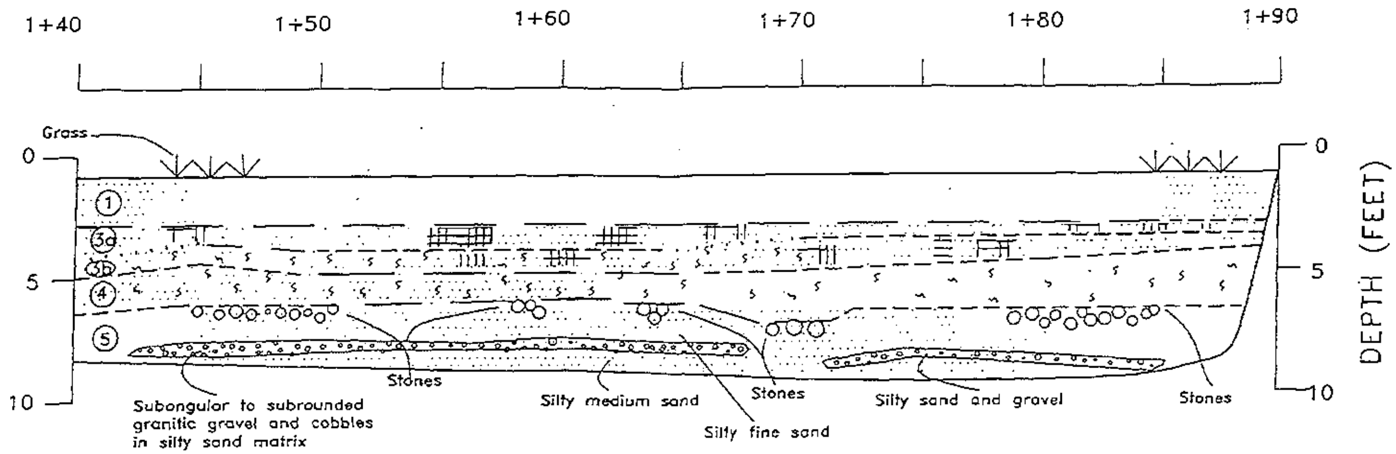
TRENCH LOG
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

PLATE
1a
PROJECT
2725

STATION (FEET)



EARTH MATERIALS

1. Silt with coarse sand (ML): Medium brown, dry, loose, contains angular white to light gray medium to coarse granitic sand and fine gravel, many voids and fine roots, weak granular structure, upper 6"–10" disturbed by plowing [A Horizon]

2. Medium to coarse sandy silt (ML): Pale orange brown with light gray granitic sand, dry, medium dense, few voids [B Horizon]

3a Medium to coarse sandy clayey silt (CL–ML): Pale orange brown with light gray granitic sand and dark brown clay–skin coating on ped faces producing dull sheen, dry, weak block to prismatic structure [B Horizon]

3b Sandy clayey silt (CL–ML): Pale orange brown with light gray granitic sand, and dark brown clay–skin coating on ped faces, weak blocky to prismatic structure, white carbonate filiments (stage 1) [Btk Horizon]

4. Fine sandy silt (ML): Pale orange brown, damp, medium dense to dense, few to pervasive buff carbonate filiments, veins and discontinuous coating on ped faces (Stage 1 carbonate morphology) [Bk Horizon]

5. Alluvium (Qal): Predominantly silty granitic sand with gravel with near–horizontal interbeds of fine to coarse sand, gravel and some granitic cobble–size clasts, pale orange brown, moist to wet, dense, locally friable, clasts sub–angular to sub–rounded, interbed laterally discontinuous

CONTACTS	
———	ABRUPT, <1"
— —	CLEAR, <3"
- - - - - -	GRADUAL, <6"
. . . .	DIFFUSE, >6"

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TRENCH LOG
SAN JUAN ELEMENTARY SCHOOL
SAN JUAN BAUTISTA, CALIFORNIA

PLATE 1b
PROJECT 2725

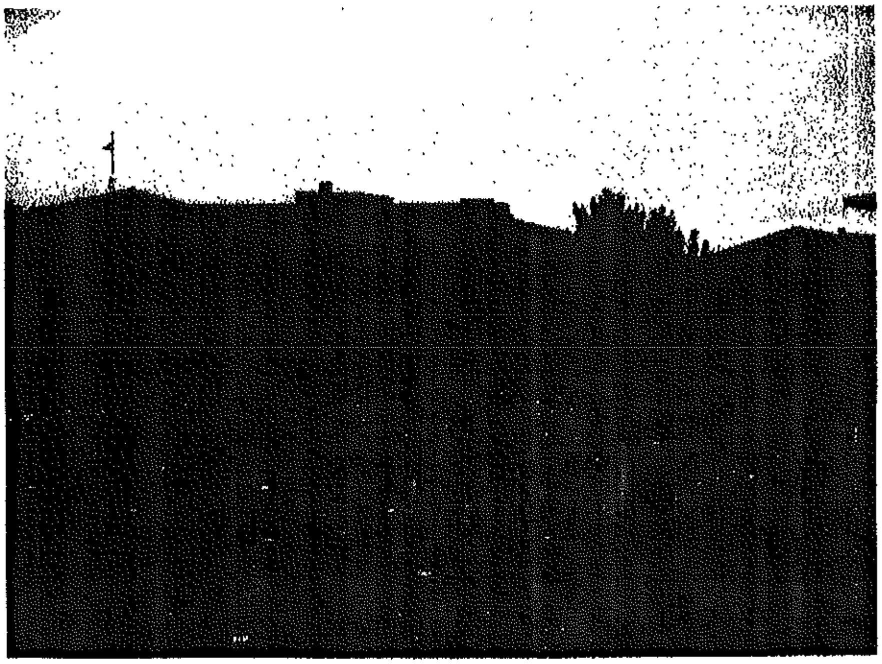

Photo 1: Building Addition Site. Southeast wall of existing building shown.

Photo 2: Descending scarp and marshy area along San Andreas fault trace.

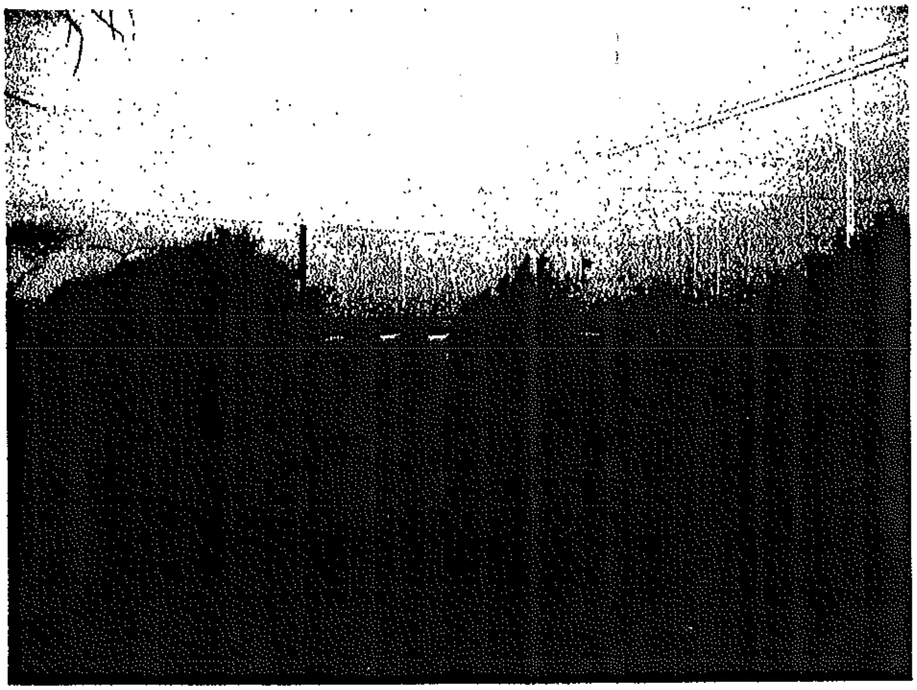

Photo 3: Private land where fault trench was excavated. Existing kindergarten building beyond.

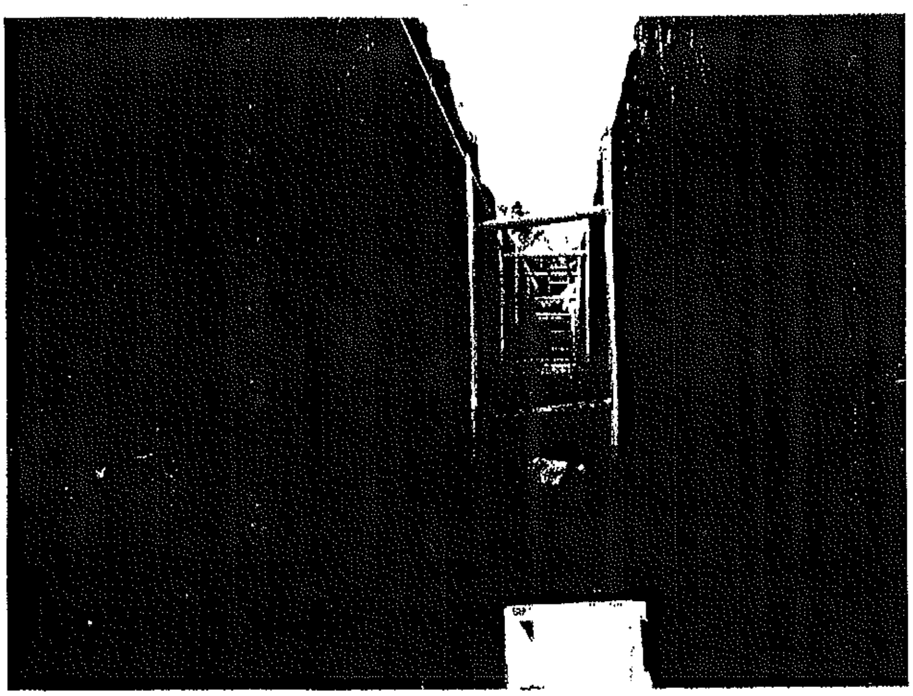

Photo 4: Fault trench looking northeast. Flags on left (northwest) wall showing level of stones. Continuous soil horizons flagged on opposite wall.

KEY TO EXPLORATORY BORING LOGS

PRIMARY DIVISIONS			GROUP1 SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size	GRAVELS More than half coarse fraction is larger than No.4 sieve	Clean Gravels (less than 5% fines*)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravel with fines*	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS More than half coarse fraction is smaller than No.4 sieve	Clean Sands (less than 5% fines*)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		Sands with fines*	SM	Silty sands, silt-sand mixtures, non-plastic fines
			SC	Clayey sand, sand-clay mixtures, plastic fines
FINE GRAINED SOILS More than half of material is smaller than No. 200 sieve size	SILTS AND CLAYS Liquid limit is less than 50		ML	Inorganic silts, clayey silts, rock flour, silty very fine sands
			CL	Inorganic clays of low plasticity, gravelly clay of low plasticity
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit is greater than 50		MH	Inorganic silts, clayey silts, elastic silts, micaceous or diatomaceous silty or fine sandy soil
			CH	Inorganic clays of high plasticity
			OH	Organic clays and silts of high plasticity
HIGHLY ORGANIC SOILS			Pt	Peat, meadow mat, highly organic soils

GRAIN SIZES

U.S. STANDARD SERIES SIEVE	200		40	10	4	CLEAR SQUARE SIEVE OPENINGS ¾"		3"	12"
Silts and Clays	SAND			GRAVEL		Cobbles	Boulders		
	Fine	Medium	Coarse	Fine	Coarse				

RELATIVE DENSITY	
SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT*
VERY LOOSE	0 – 4
LOOSE	4 – 10
MEDIUM DENSE	10 – 30
DENSE	30 – 50
VERY DENSE	OVER 50

CONSISTENCY		
CLAYS AND PLASTIC SILTS	STRENGTH**	BLOWS/FOOT*
VERY SOFT	0 – ¼	0 – 2
SOFT	¼ – ½	2 – 4
FIRM	½ – 1	4 – 8
STIFF	1 – 2	8 – 16
VERY STIFF	2 – 4	16 – 32
HARD	OVER 4	OVER 32

SYMBOLS

▽	Initial Ground Water Level
▼	Final Ground Water Level
T	Standard Penetration Sampler (Teizaghi) – 2 inch O.D. (1 3/8 inch I.D.) split spoon sampler (ASTM D1586-84).
C	California Sampler – 3" O.D. (2 1/2 inch I.D.) sampler
ST	Shelby/Pitcher Tube Sampler – 3 ½ inch O.D. (3 inch I.D.) CME brand split spoon sampler (5 foot long); advances with augers and provides a 3 foot long continuous core.

NOTES

*BLOWS per FOOT – Resistance to the advancement of the soil sampler-number of blows of a 140-pound hammer falling 30 inches to drive a split spoon sampler.

**Unconfined compression strength in tons/sq.ft. as estimated by SPT Resistance, field and laboratory tests, and/or visual observation.

Stratification lines on the logs represent the approximate boundary between soil types, and the transition may be gradual.

BORING LOG

No. B - 1

PROJECT: San Juan Elementary Kindergarten Building Addition DATE: 10/31/2002 LOGGED BY: BB

DRILL RIG: Mobile B-56 HOLE DIA.: 8" SAMPLER: T=SPT, C=California (2.5" O.D.)

GROUND WATER DEPTH INITIAL: 28' FINAL: N/A HOLE ELEVATION: NM

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY LIMIT	MINUS #200 (%)	Unconfined Compression Test (ksf)
3" Asphalt and 9" Baserock		1										
SANDY CLAY with gravel; black to dark brown, moist to very moist, very stiff.	CL	2										
			T	17								
		3										
SANDY CLAY with gravel; light brown, moist, very stiff to hard.	CL	4										
			C	46			19	117	37	11	79	
		5										
		6										
			C	50								
		7										
SILTY SAND; brown to light brown, moist, dense, fine to coarse grain, some fine gravel.	SM	8										
		9										
		10										
		11										
D_{60} = 0.85 mm			T	30							18	
		12										
		13										
		14										
		15										
		16										
			T	35								
		17										
		18										
SILTY SAND/SANDY CLAY; light brown, very moist to wet, medium dense, fine to medium grain.	SM/ CL	19										
		20										

BORING LOG

No. B - 1

PROJECT: San Juan Elementary Kindergarten Building Addition | DATE: 10/31/2002 | LOGGED BY: BB

DRILL RIG: Mobile B-56 | HOLE DIA.: 8" | SAMPLER: T=SPT, C=California (2.5" O.D.)

GROUND WATER DEPTH INITIAL: 28' | FINAL: N/A | HOLE ELEVATION: NM

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY LIMIT	MINUS #200 (%)	Unconfined Compression Test (ksf)
SILTY SAND/SANDY CLAY; (continued)	SM/ CL	21										
SANDY CLAY with gravel; light gray to olive, very moist, stiff.	CL		T	9							48	
		22										
		23										
		24										
		25										
light brown to olive-brown.		26										
			T	14								
		27										
		28										
		29										
		30										
WELL GRADED SAND-CLAYEY SAND; light brown, wet, dense, coarse grain.	SW-SC	31										
D_{50} = 1.5 mm			T	47							10	
		32										
		33										
CLAYEY SAND with gravel; light brown, moist, brown, wet, dense to very dense, fine to medium grain.	SC	34										
		35										
		36										
D_{50} = 0.3 mm			T	51							35	
		37										
		38										
		39										
		40										

BORING LOG

No. B - 1

PROJECT: San Juan Elementary Kindergarten Building Addition DATE: 10/31/2002 LOGGED BY: BB

DRILL RIG: Mobile B-56 HOLE DIA.: 8" SAMPLER: T=SPT, C=California (2.5" O.D.)

GROUND WATER DEPTH INITIAL: 28' FINAL: N/A HOLE ELEVATION: NM

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	WATER CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY LIMIT	MINUS #200 (%)	Unconfined Compression Test (ksf)
CLAYEY SAND with gravel; (continued)	SC	41	T	61								
Bottom of boring @ 41.5'.		42										
Drill hole backfilled with cutting and capped with asphalt.		43										
		44										
		45										
		46										
		47										
		48										
		49										
		50										
		51										
		52										
		53										
		54										
		55										
		56										
		57										
		58										
		59										
		60										

APPENDIX C

TESTa

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*                       *
*   E Q S E A R C H     *
*                       *
*    Version 3.00       *
*                       *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 2725

JOB NAME: Aromas-San Juan School District

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 5.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 36.8410
SITE LONGITUDE: 121.5300

SEARCH DATES:
START DATE: 1800
END DATE: 2002

SEARCH RADIUS:
62.4 mi
100.4 km

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: 0 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

TESTa

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
T-A	36.8300	121.5700	10/18/1800	0 0 0.0	0.0	7.00	0.627	X	2.3(3.8)
DMG	36.8000	121.5000	11/13/1892	1245 0.0	0.0	5.60	0.346	IX	3.3(5.3)
DMG	36.8000	121.4500	06/24/1939	13 2 0.0	0.0	5.50	0.236	IX	5.2(8.4)
DMG	36.9100	121.4800	11/28/1974	23 124.7	0.0	5.20	0.174	VIII	5.5(8.9)
DMG	36.9000	121.6000	04/24/1890	1136 0.0	0.0	6.00	0.333	IX	5.6(9.0)
DMG	36.9000	121.6000	03/30/1883	1545 0.0	0.0	5.60	0.243	IX	5.6(9.0)
MGI	36.9000	121.6000	10/11/1800	0 0 0.0	0.0	5.70	0.264	IX	5.6(9.0)
DMG	36.8700	121.6300	09/14/1963	194617.0	0.0	5.40	0.197	VIII	5.9(9.4)
DMG	36.8300	121.4200	12/31/1910	1211 0.0	0.0	5.00	0.133	VIII	6.1(9.9)
DMG	36.7800	121.4300	01/20/1960	32553.0	0.0	5.00	0.119	VII	6.9(11.2)
GSB	36.7550	121.4640	08/12/1998	141025.1	8.0	5.40	0.168	VIII	7.0(11.2)
DMG	36.8000	121.4000	04/02/1885	1525 0.0	0.0	5.40	0.152	VIII	7.7(12.4)
GSB	36.9180	121.6700	04/18/1990	134138.8	6.0	5.00	0.087	VII	9.4(15.1)
GSB	36.9170	121.6750	04/18/1990	135351.4	5.0	5.40	0.120	VII	9.6(15.4)
DMG	36.9000	121.7000	04/30/1899	2241 0.0	0.0	5.60	0.131	VIII	10.2(16.5)
DMG	36.9300	121.6800	04/25/1954	203328.0	0.0	5.30	0.101	VII	10.3(16.6)
DMG	36.9800	121.6000	03/02/1959	232717.0	30.0	5.30	0.101	VII	10.3(16.6)
GSB	36.9320	121.6950	04/18/1990	154603.7	9.0	5.20	0.085	VII	11.1(17.8)
DMG	37.0000	121.5000	06/20/1897	2014 0.0	0.0	6.20	0.188	VIII	11.1(17.9)
T-A	37.0000	121.5700	03/25/1859	0 0 0.0	0.0	5.00	0.071	VI	11.2(18.0)
MGI	37.0000	121.5700	01/09/1928	250 0.0	0.0	5.30	0.092	VII	11.2(18.0)
DMG	37.0200	121.4800	03/09/1949	122839.0	0.0	5.20	0.072	VII	12.7(20.4)
GSB	36.8030	121.3020	02/20/1988	083957.5	9.0	5.30	0.077	VII	12.9(20.7)
GSB	37.0250	121.4580	01/16/1993	062934.9	5.0	5.30	0.074	VII	13.3(21.4)
GSB	36.8100	121.2750	01/26/1986	192051.2	7.0	5.50	0.080	VII	14.3(22.9)
DMG	36.9000	121.8000	03/11/1910	652 0.0	0.0	5.50	0.072	VI	15.5(24.9)
DMG	36.7000	121.3000	03/31/1885	756 0.0	0.0	5.50	0.068	VI	16.0(25.8)
DMG	36.7000	121.3000	04/09/1961	72541.0	0.0	5.50	0.068	VI	16.0(25.8)
DMG	36.6800	121.3000	04/09/1961	72316.0	0.0	5.60	0.069	VI	16.9(27.2)
DMG	37.0600	121.6900	11/16/1964	24641.7	0.0	5.00	0.040	V	17.5(28.2)
DMG	37.0000	121.7800	12/18/1967	172432.0	0.0	5.30	0.051	VI	17.6(28.4)
BRK	37.1000	121.5000	08/06/1979	17 522.0	0.0	5.80	0.075	VII	18.0(28.9)
DMG	37.1000	121.6000	03/26/1866	2012 0.0	0.0	5.40	0.053	VI	18.3(29.4)
DMG	36.9000	121.2000	03/06/1882	2145 0.0	0.0	5.70	0.066	VI	18.7(30.0)
T-A	36.6700	121.2500	04/01/1857	1135 0.0	0.0	5.00	0.035	V	19.5(31.3)
DMG	36.6700	121.2500	08/06/1916	1938 0.0	0.0	5.50	0.053	VI	19.5(31.3)
DMG	37.1000	121.7000	02/26/1864	1347 0.0	0.0	5.90	0.069	VI	20.2(32.5)
DMG	37.1000	121.8000	05/24/1865	1121 0.0	0.0	5.50	0.041	V	23.3(37.4)
GSB	37.0780	121.8320	10/25/1989	012726.6	14.0	5.00	0.027	V	23.3(37.6)
GSB	37.0360	121.8830	10/18/1989	000415.2	18.5	7.00	0.128	VIII	23.7(38.1)
GSB	36.6030	121.2010	04/23/1995	084136.6	7.0	5.00	0.026	V	24.5(39.5)
DMG	37.2000	121.5000	07/06/1899	2010 0.0	0.0	5.80	0.048	VI	24.8(40.0)
DMG	36.5780	121.2090	02/24/1972	155651.0	7.5	5.10	0.026	V	25.4(40.9)

DMG	36.5800	121.1800	07/29/1951	105345.0	0.0	5.00	0.023	IV	26.5(42.6)
GSB	37.1300	121.8780	06/27/1988	184322.3	13.0	5.70	0.038	V	27.7(44.5)
T-A	37.0000	122.0000	06/30/1890	2030 0.0	0.0	5.00	0.021	IV	28.2(45.3)
GSB	37.1300	121.9520	08/08/1989	081327.5	15.0	5.30	0.024	IV	30.7(49.3)
DMG	37.2500	121.7500	07/01/1911	22 0 0.0	0.0	6.60	0.067	VI	30.7(49.4)
MGI	36.6000	122.0000	07/03/1841	22 7 0.0	0.0	5.00	0.019	IV	30.9(49.7)
DMG	36.4500	121.2500	09/27/1938	1223 0.0	0.0	5.00	0.018	IV	31.1(50.1)
GSB	37.3200	121.6980	04/24/1984	211519.0	8.0	6.20	0.042	VI	34.3(55.3)
DMG	37.1700	122.0000	11/09/1914	231 0.0	0.0	5.50	0.024	IV	34.5(55.5)
DMG	37.3000	121.8000	08/03/1903	649 0.0	0.0	5.50	0.023	IV	35.0(56.3)

EARTHQUAKE SEARCH RESULTS

Page 2

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	37.3000	121.8000	01/02/1891	20 0 0.0	0.0	5.50	0.023	IV	35.0(56.3)
MGI	37.3000	121.9000	05/28/1927	1739 0.0	0.0	5.00	0.014	IV	37.7(60.6)
DMG	37.3000	121.9000	10/08/1865	2046 0.0	0.0	6.30	0.040	V	37.7(60.6)
GSB	36.3730	121.9070	01/23/1984	054019.7	7.0	5.40	0.019	IV	38.5(61.9)
DMG	37.0200	122.2000	10/24/1926	225149.5	0.0	5.50	0.020	IV	39.0(62.7)
DMG	37.3700	121.7800	09/05/1955	2 118.0	0.0	5.50	0.020	IV	39.0(62.8)
GSB	36.3630	121.9100	01/23/1984	065950.4	5.0	5.00	0.013	III	39.1(63.0)
DMG	37.4000	121.4000	04/10/1881	10 0 0.0	0.0	5.90	0.027	V	39.2(63.2)
GSB	37.3850	121.7720	06/13/1988	014536.8	7.0	5.40	0.018	IV	39.8(64.1)
DMG	37.2000	122.1000	02/17/1870	2012 0.0	0.0	5.80	0.025	V	40.0(64.4)
DMG	36.5700	122.1700	10/22/1926	133522.0	0.0	6.10	0.031	V	40.1(64.5)
GSB	37.1980	122.1050	10/18/1989	004124.7	19.0	5.10	0.014	IV	40.1(64.6)
DMG	36.9500	122.2600	02/15/1927	2354 3.5	0.0	5.00	0.012	III	41.0(66.0)
DMG	37.1000	122.2000	03/26/1884	040 0.0	0.0	5.90	0.026	V	41.1(66.1)
DMG	36.4000	121.0000	04/12/1885	4 5 0.0	0.0	6.20	0.031	V	42.3(68.1)
DMG	36.6000	120.8000	07/25/1926	175749.0	15.0	5.00	0.011	III	43.7(70.3)
GSB	37.4830	121.6900	03/31/1986	115540.0	8.0	5.70	0.019	IV	45.2(72.7)
DMG	37.5000	121.3000	07/15/1866	630 0.0	0.0	5.80	0.019	IV	47.2(76.0)
DMG	36.6100	122.3500	10/22/1926	1235 7.0	0.0	6.10	0.024	V	48.1(77.4)
DMG	37.5000	121.9000	11/26/1858	835 0.0	0.0	6.10	0.023	IV	49.8(80.2)
DMG	37.6000	121.8000	06/11/1903	1312 0.0	0.0	5.50	0.012	III	54.5(87.6)
DMG	37.6000	122.1000	05/21/1864	2 1 0.0	0.0	5.30	0.009	III	61.1(98.3)
DMG	37.5000	122.3000	02/15/1856	1325 0.0	0.0	5.50	0.010	III	62.2(100.0)

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-END OF SEARCH- 76 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2002

LENGTH OF SEARCH TIME: 203 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 2.3 MILES (3.8 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.0

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.627 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 1.307

b-value= 0.392
beta-value= 0.902

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	76	0.37438
4.5	76	0.37438
5.0	76	0.37438
5.5	40	0.19704
6.0	11	0.05419
6.5	3	0.01478
7.0	2	0.00985

TESTb

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*                       *
*   E Q S E A R C H     *
*                       *
*    Version 3.00       *
*                       *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 2725

JOB NAME: Aromas-San Juan School District

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
  MINIMUM MAGNITUDE: 6.00
  MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
  SITE LATITUDE: 36.8410
  SITE LONGITUDE: 121.5300

SEARCH DATES:
  START DATE: 1800
  END DATE: 2002

SEARCH RADIUS:
  100.0 mi
  160.9 km

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
  UNCERTAINTY (M=Median, S=Sigma): M   Number of Sigmas: 0.0
  ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
  SCOND: 0 Depth Source: A
  Basement Depth: 5.00 km   Campbell SSR: 0   Campbell SHR: 0
  COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

TESTb

EARTHQUAKE SEARCH RESULTS

Page 1

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
T-A	36.8300	121.5700	10/18/1800	0 0 0.0	0.0	7.00	0.627	X	2.3(3.8)
DMG	36.9000	121.6000	04/24/1890	1136 0.0	0.0	6.00	0.333	IX	5.6(9.0)
DMG	37.0000	121.5000	06/20/1897	2014 0.0	0.0	6.20	0.188	VIII	11.1(17.9)
GSB	37.0360	121.8830	10/18/1989	000415.2	18.5	7.00	0.128	VIII	23.7(38.1)
DMG	37.2500	121.7500	07/01/1911	22 0 0.0	0.0	6.60	0.067	VI	30.7(49.4)
GSB	37.3200	121.6980	04/24/1984	211519.0	8.0	6.20	0.042	VI	34.3(55.3)
DMG	37.3000	121.9000	10/08/1865	2046 0.0	0.0	6.30	0.040	V	37.7(60.6)
DMG	36.5700	122.1700	10/22/1926	133522.0	0.0	6.10	0.031	V	40.1(64.5)
DMG	36.4000	121.0000	04/12/1885	4 5 0.0	0.0	6.20	0.031	V	42.3(68.1)
DMG	36.6100	122.3500	10/22/1926	1235 7.0	0.0	6.10	0.024	V	48.1(77.4)
DMG	37.5000	121.9000	11/26/1858	835 0.0	0.0	6.10	0.023	IV	49.8(80.2)
DMG	37.7000	122.1000	10/21/1868	1553 0.0	0.0	6.80	0.026	V	67.1(107.9)
DMG	37.6000	122.4000	06/01/1838	0 0 0.0	0.0	7.00	0.028	V	70.9(114.2)
DMG	37.8000	122.2000	06/10/1836	1530 0.0	0.0	6.80	0.022	IV	75.7(121.9)
BRK	36.2200	120.4000	07/22/1983	23955.0	0.0	6.00	0.012	III	75.9(122.2)
DMG	35.7300	121.2000	11/22/1952	74637.0	0.0	6.00	0.011	III	78.9(126.9)
DMG	37.7000	122.5000	04/18/1906	131221.0	0.0	8.25	0.064	VI	79.7(128.3)
BRK	36.2200	120.2900	05/02/1983	234239.0	0.0	6.70	0.018	IV	81.1(130.4)
DMG	38.0000	121.9000	05/19/1889	1110 0.0	0.0	6.00	0.010	III	82.6(132.8)
MGI	37.8000	122.5000	06/21/1808	0 0 0.0	0.0	6.30	0.013	III	85.0(136.7)
DMG	35.8000	120.3300	06/08/1934	447 0.0	0.0	6.00	0.008	III	98.1(157.9)

****

-END OF SEARCH- 21 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2002

LENGTH OF SEARCH TIME: 203 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 2.3 MILES (3.8 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 8.3

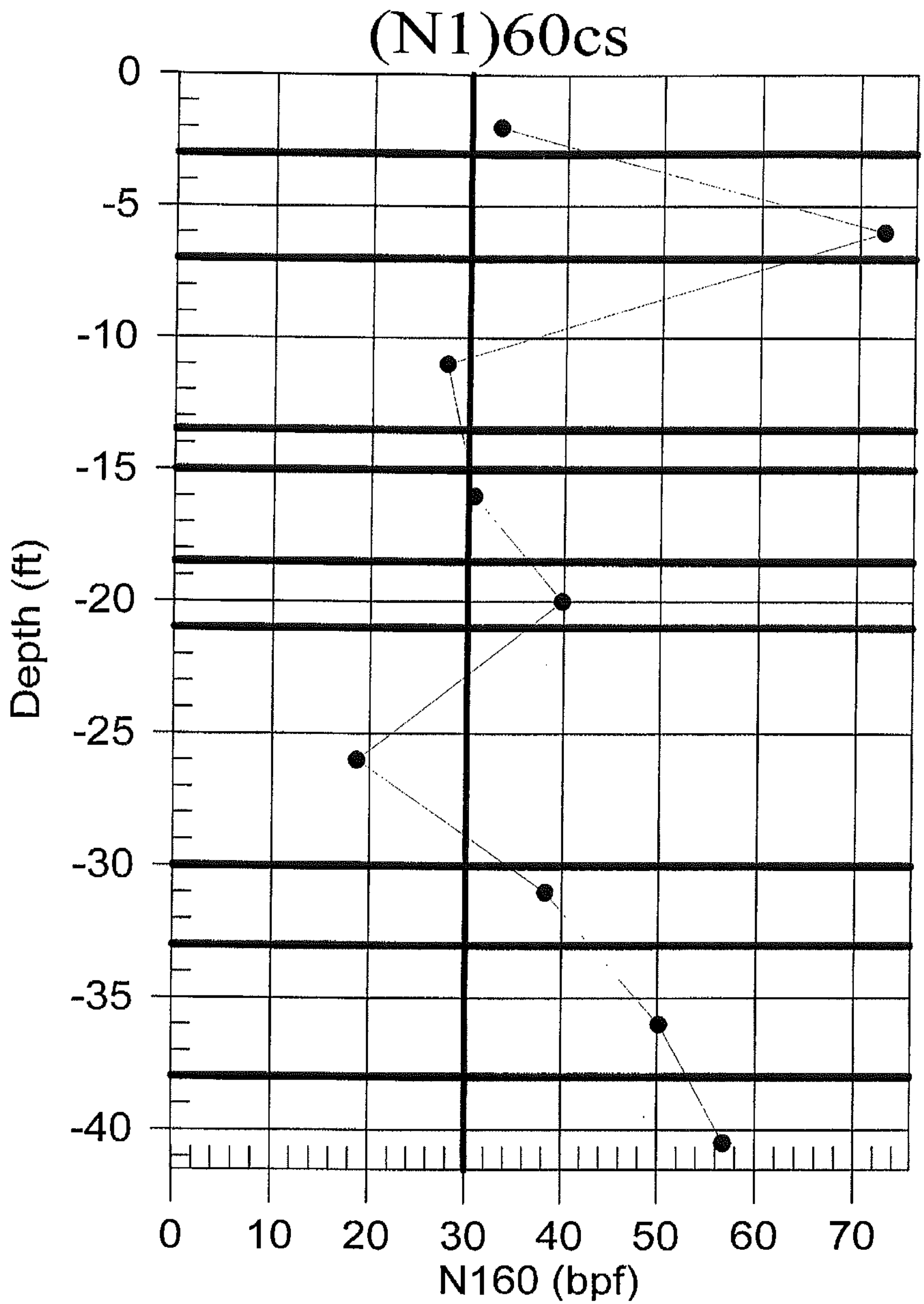
LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.627 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
-a-value= 0.985
b-value= 0.000
beta-value= 0.000

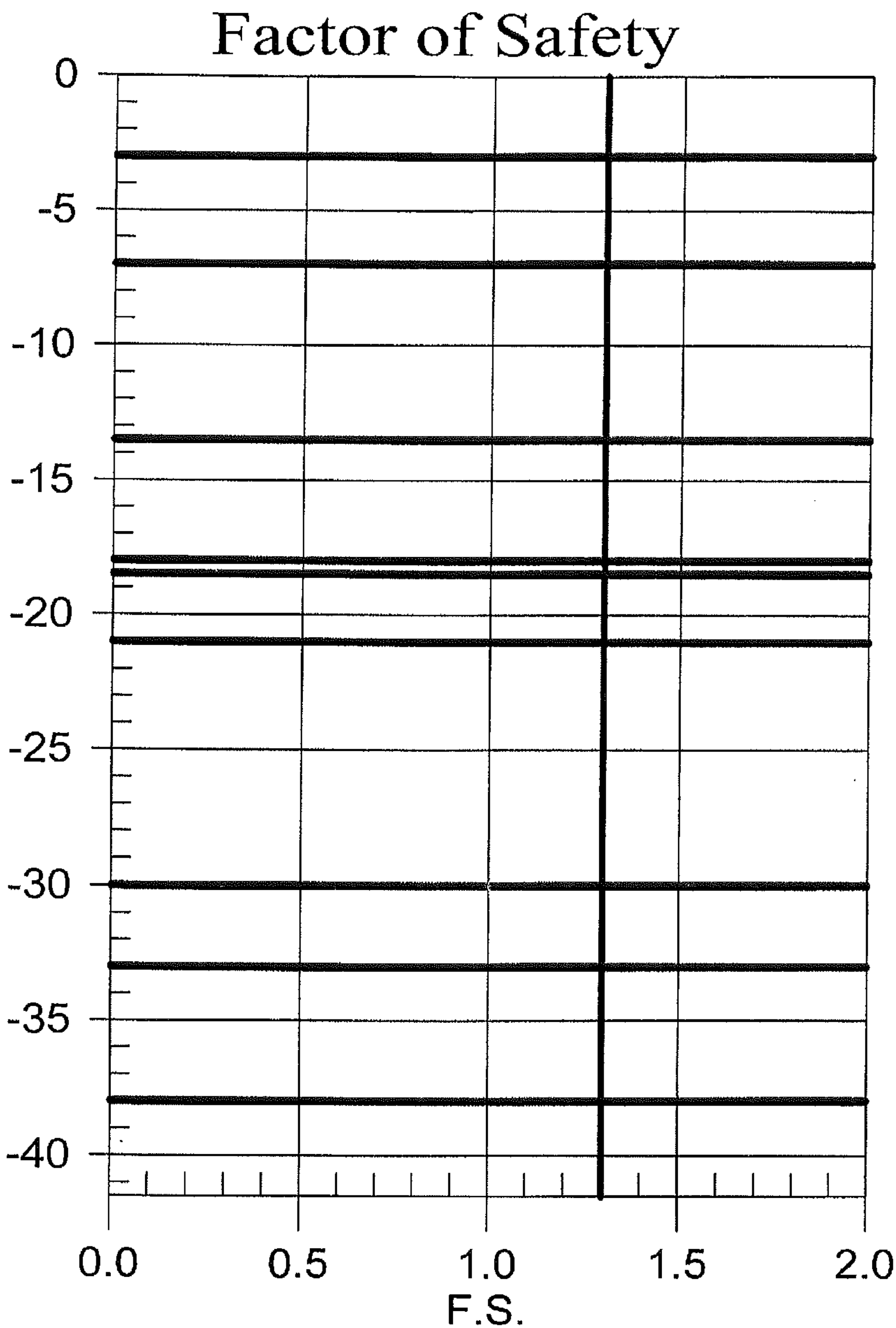
TABLE OF MAGNITUDES AND EXCEEDANCES:

TESTb

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	21	0.10345
4.5	21	0.10345
5.0	21	0.10345
5.5	21	0.10345
6.0	21	0.10345
6.5	8	0.03941
7.0	4	0.01970
7.5	1	0.00493
8.0	1	0.00493



(N1)60cs
0
-5
-10
-15
-20
-25
-30
-35
-40
Depth (ft)
0
10
20
30
40
50
60
70
N160 (bpf)



Factor of Safety
0
-5
-10
-15
-20
-25
-30
-35
-40
0.0
0.5
1.0
1.5
2.0
F.S.

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

April 30, 1987
Project No. 479.1
Ser. 3064

Mr. David N. Evans, District Superintendent
San Juan Union School District
100 Nyland Drive
San Juan Bautista, California 95045

RE: FAULT LOCATION INVESTIGATION
SAN JUAN JUNIOR HIGH SCHOOL ADDITIONS
SAN JUAN BAUTISTA, CALIFORNIA

Dear Mr. Evans:

As authorized by you, we have performed a fault location investigation for the planned San Juan Junior High School additions in San Juan Bautista, California. The accompanying report presents results of our field investigation and geological analysis. The geologic conditions are discussed and appropriate conclusions and recommendations are presented.

Please refer to the text of this report for a detailed discussion of our findings. If you have any questions concerning this report, please call.

Yours very truly,

CLEARY CONSULTANTS, INC.

Michael K. Shimamoto
Geologist 4214

J. Michael Cleary
Civil Engineer 21014
Geologist 918
Engineering Geologist 352

MKS/JMC:pc
Copies: Addressee (2)
Porter-Jensen-Hansen-Manzagol, Architects (3)

INTRODUCTION

This report presents the results of our fault location investigation for the proposed San Juan Junior High School addition and emergency relocatable classroom buildings to be located on the San Juan Union School District property located on the east side of The Alameda between Pearce Lane and Nyland Drive in San Juan Bautista, California. The general location of the site is shown on Drawing 1, Site Location and Special Studies Zone Map. The property is situated within the State of California Special Studies Zone for the San Andreas fault.

As shown on Drawing 1, the trace of the active San Andreas fault has been mapped immediately east of the school district property. The purpose of this investigation, therefore, was to evaluate the possible hazard of fault offset through the site in compliance with the regulations of the Alquist-Priolo Special Studies Zones Act.

SCOPE

The scope of services performed in this investigation included a review of published and unpublished geologic information for the area, several geologic reconnaissances of the site and surrounding areas to map surficial geologic features, a review of stereoscopic aerial photographs of the site and vicinity, geophysical exploration consisting of magnetometer traverses across the property and suspected fault trace, subsurface fault trenching, geologic analysis of the field data and preparation of this report.

This report has been prepared for the exclusive use of the San Juan Union School District and its consultants in accordance with generally accepted engineering geology principles and practices. No other warranty, expressed or implied, is made.

METHOD OF INVESTIGATION

A review of published and unpublished geologic literature of the site vicinity was initially conducted to determine the regional geologic conditions of the area. This literature is listed in the Bibliography at the end of the text. At this time, stereoscopic aerial photographs of the site and surrounding area were examined for evidence of faulting and other geologic hazards. These photographs are also listed in the Bibliography.

Our engineering geologists conducted several reconnaissances of the property and adjoining areas during April 1987 to observe and map surface geologic features. The results of the mappings are shown on Drawing 3, Site Plan and Geologic Map.

A total of two magnetometer traverses using a Geometrics Unimag Model G-836 Portable Proton Magnetometer were performed across the site and adjacent property to the east. The traverses were oriented at right angles to the San Andreas fault and magnetic intensity readings were taken at 10 foot intervals. The locations of the magnetometer survey lines are shown on Drawing 3 and the results of the survey are presented on Drawing 7.

During the period of April 13 through 16, 1987, two fault exploration trenches totaling 770 feet in length were excavated at the locations shown on Drawing 3. The trench width was 24 inches and the depth ranged from about five feet to eleven feet. The logs of the trenches are presented on Drawings 4, 5 and 6.

The attached trench logs, magnetometer data, site geologic data and related information depict subsurface conditions only at the specific locations shown on Drawing 3 and on the particular date designated on the logs. Also, the passage of time may result in changes in the subsurface conditions due to environmental changes. The locations of the magnetometer traverses and trenches were approximately determined by pacing or taping from existing topographic features and should be considered accurate only to the degree implied by the method used. The exploration trenches were loosely backfilled and wheel-rolled after the logging was completed.

GEOLOGIC SETTING

A. Regional Geology

The site is located at the western edge of San Juan Valley, a northwest trending depression in the California Coast Ranges Geomorphic Province. The valley in the site vicinity is bound on the west by the foothills of the northern Gabilan Range and the San Andreas fault.

As shown on Drawing 2, Regional Geologic Map, the San Juan Bautista area is underlain principally by unconsolidated Holocene Age alluvium filling the San Juan Valley. The foothills area west of the site is underlain by Tertiary Age marine and non-marine sedimentary strata of the San Lorenzo Formation, Vaqueros Sandstone and Zayante Sandstone of Dibblee, 1979.

B. San Andreas Fault (Previous Regional Studies)

The San Andreas fault at San Juan Bautista is a steeply dipping to vertical northwest trending fault zone with right-lateral strike-slip displacement (Dibblee, 1980, Drawing 2). Geomorphic evidence for recent surface displacement along the fault includes a prominent linear east facing scarp up to 50 feet in height which borders the east side of the town and passes immediately east of Mission San Juan Bautista located 1000 feet northwest of the site (Brabb et. al. 1966, Hall and Glare, 1979, Sylvester et. al., 1980). This scarp has been formed in Holocene Age alluvium. The southernmost extent of documented surface rupture along the fault during the great 1906 earthquake occurred within a well defined fault trace located just northwest of the town, as shown on Drawing 1.

Historic horizontal fault creep is well documented along this segment of the San Andreas fault and the displacement is visible in several places where the fault crosses roads and other structures (see Drawing 1). Creep meters installed by the U.S. Geological Survey to measure the displacement at Nyland Ranch 1/2 mile northwest of town and at another site one mile southeast of the town, suggest that generally variable creep rates ranging from 12 millimeters per year to 5 millimeters per year have occurred along this portion of the fault since 1976. The low hill and fault scarp upon which the town has been built has been interpreted as a broad compressional uplift resulting from the differential creep rates and crustal shortening produced along the fault (Nason, 1971). Recent first order level studies, performed across the uplift and scarp, however, have failed to show vertical movement of undoubted tectonic origin (Sylvester et.al., 1980). In the vicinity of the site, the San Andreas has been mapped as a single active fault trace with a possible second concealed parallel strand approximately 250 feet northeast of the site (see Drawing 1). Recent fault evaluation studies of the San Andreas fault have been performed in adjacent quadrangles to the northwest and southeast (Hart et. al., 1981).

GEOLOGIC SITE CONDITIONS

Surface

The proposed site is a gently sloping, grass covered field bounded by the existing school buildings and Nyland Drive on the south, The Alameda on the west, Pearce Lane on the north and undeveloped agricultural land on the east (Drawing 3). The property is roughly bisected by a shallow east flowing drainage swale. A low hill (compressional uplift?) exists in the northeast corner of the parcel.

A five to ten foot high easterly facing scarp and the mapped trace of the San Andreas fault are located immediately northeast of the site. A shallow southeasterly flowing creek is present at the base of this scarp. The scarp can be traced 1000 feet northwest to the area of the Mission San Juan Bautista where there is positive evidence of active fault creep. Right lateral offsets exist in a concrete wall and stairway in the old rodeo grandstand at this location and springs are also reported from the scarp (Hall and Glare, 1979). To the southeast of the site, the scarp is traceable for a distance of approximately 500 feet to a second active creep zone shown on the Special Studies Zone Map (see Drawing 1).

No surface evidence of active faulting was observed within the property limits during our reconnaissance of the site or aerial photograph review. Our review of aerial photographs, site reconnaissance and the magnetic surveys, however, strongly indicate a fault alignment as shown on the State of California Special Studies Zone Map of the San Juan Bautista Quadrangle (see Drawing 1).

Subsurface

The subsurface soils encountered in the exploratory trenches consisted generally of a two to four foot thick sandy silt topsoil horizon overlying irregularly bedded sandy clay, silt and gravelly to silty sand alluvial deposits to the maximum depth explored of 12 feet. Up to six feet of artificial fill was encountered overlying alluvium in a short interval of Exploratory Trench No. 1. The silt, sand and clay beds encountered in the trenches were generally flat lying and readily distinguishable. The beds were generally continuous laterally and could be traced on the trench walls for considerable distances. All areas where the bedding displayed irregular changes in thickness or where intertongueing contacts, pinch outs or scour and fill structures were encountered were closely examined for possible evidence of faulting.

A detailed description of the materials encountered in the trenches is presented in the Logs of Exploratory Trench No. 1 and 2, Drawings 4, 5 and 6. No evidence of offset bedding, shearing or other displacement indicative of faulting was found in the two trenches.

Groundwater was encountered in both trenches in close proximity to the natural drainages on the property. Free groundwater was encountered at a depth of approximately 8 1/2 feet in a sand layer at the eastern end of Exploratory Trench No. 1. Exploratory Trench No. 2 encountered heavy groundwater flows from a clean coarse sand bed in several areas of the trench at depths of approximately 4 to 5 feet. Excessive groundwater seepage and caving occurred below this depth and precluded deeper excavations. Trench No. 2 was originally excavated an additional 65 feet to the west (total length of trench was 215 feet), however, caving due to groundwater seepage occurred in the western end of the excavation preventing further logging to be performed in this area (see Drawing 6). Past high groundwater levels and springs are known to have existed in the area of the Mission northwest of this site and may be attributable to a groundwater barrier created by the San Andreas fault (Hill and Glase, 1979).

MAGNETOMETER SURVEY

A total of two magnetometer traverses were performed in a southwest to northeast direction across the site and eastward across the low lying scarp immediately east of the site and adjoining 150 feet of the plowed agricultural field. The location of the traverses are shown on Drawing 3, and the results are presented on Drawing 7. The purpose of the magnetometer surveys was to locate possible anomalous variations in the magnetic field indicative of faulting.

As shown on Drawing 1, with the exception of the anomalous values caused by overhead power lines along The Alameda, the relative variations in the magnetic intensities recorded across the school district property are generally within a few gammas. Step downs in average magnetic intensity of 30 and 20 gammas in Magnetometer Lines No. 1 and 2, respectively, are present, however, 20 to 40 feet northeast of the property line. The magnetic intensity declines occur at the approximate location of the San Andreas fault as identified in this report and shown on the CDMG San Juan Bautista quad (see Drawing 1). The small magnetic intensity stepdown going from west to east across the fault may reflect crustal shortening and a higher bedrock surface on the west side of the fault, as suggested by the scarp at the east side of the school district property.

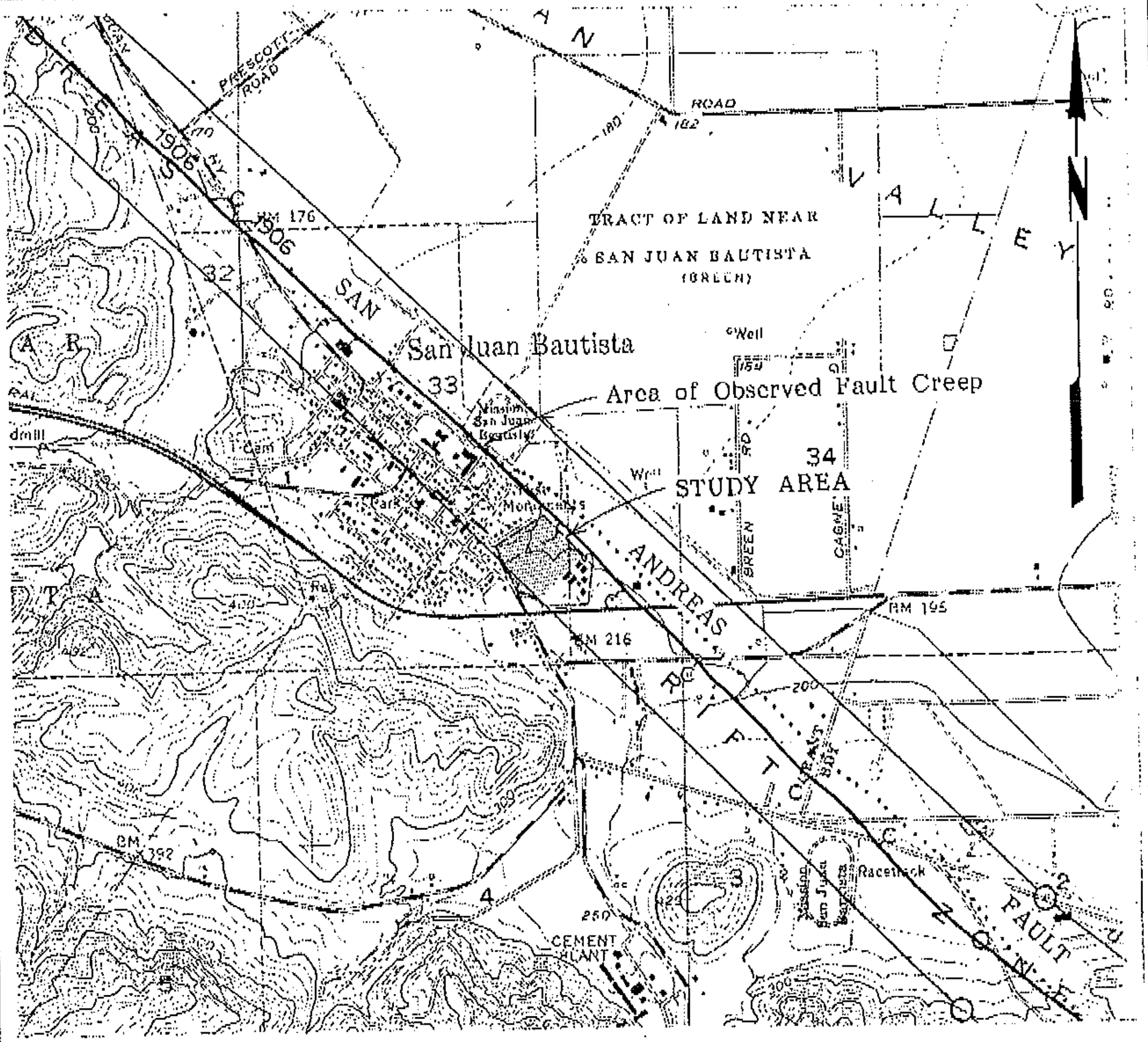
CONCLUSIONS AND RECOMMENDATIONS

The findings of our investigation indicate that the proposed San Juan Junior High School addition and emergency relocatable classrooms will be located outside the zone of fault rupture hazard. We found no evidence of faulting within the site and conclude that the likelihood of surface fault rupture within the area investigated is low. As shown on Drawing 3, the most probable location of the San Andreas fault is 30 to 40 feet east of the property based on the scarp alignment, active creep zone alignment, aerial photograph study and the results of our magnetometer survey.

Based on the data obtained, we believe that the location of the San Andreas fault in the vicinity of the property has been sufficiently defined for the purposes of the proposed new construction. We recommend that a setback of 50 feet from the indicated fault trace shown on Drawing 3 be maintained for the siting of the future relocatable classroom buildings and additions. It should be noted that the site is in an area of high seismic activity and the classroom buildings should be designed to withstand strong ground shaking in accordance with applicable seismic provisions of the Uniform Building Code, latest edition and/or local regulations. Although the classrooms will probably be subjected to at least one strong earthquake during their lifetime, the risk of fault offset is considered low for classrooms sited in accordance with the recommendations of this report.

ADDITIONAL STUDIES

This investigation has been performed solely to establish the suitability of the proposed building areas with respect to the hazard of fault offset. A final geotechnical investigation should be performed for building and foundation design purposes.



EXPLANATION

1906 C

Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

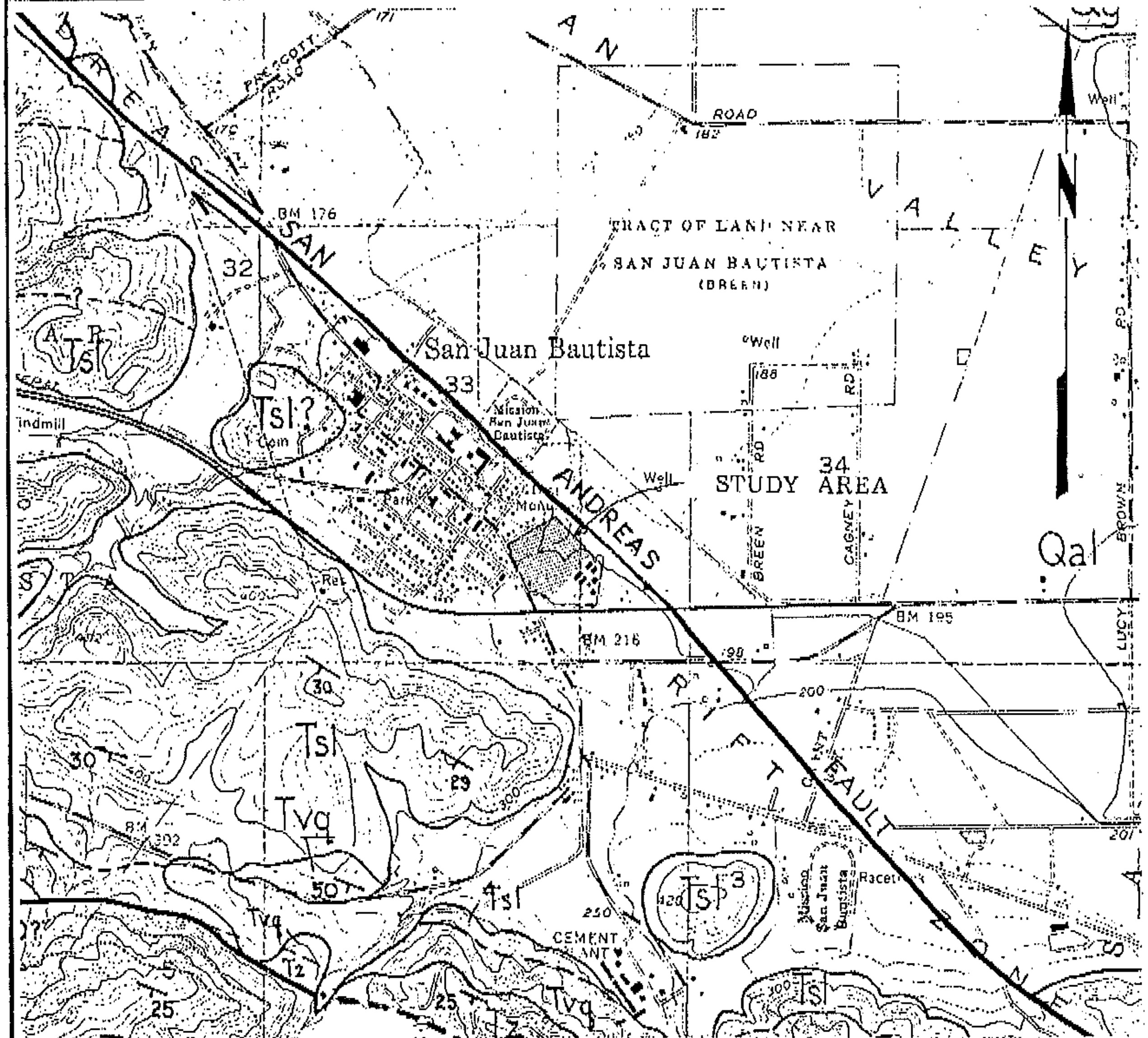
BASE: State of California Special Studies Zone Map, San Juan Bautista Quadrangle, July 1, 1974.

SITE LOCATION AND SPECIAL STUDIES ZONE MAP

CLEARY CONSULTANTS, INC.
Geological and Geotechnical Engineers

SAN JUAN JUNIOR HIGH SCHOOL
San Juan Bautista, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 2000'	479.1	April 1987	1



EXPLANATION

Qal - Alluvium
Tz - Zayante Sandstone
Tvq - Vaqueros Sandstone
Tsl - San Lorenzo Formation Siltstone and Claystone

29 Strike and dip of bedding

Contact, dashed where approximate

Fault, dashed where inferred, arrows indicate strike-slip movement

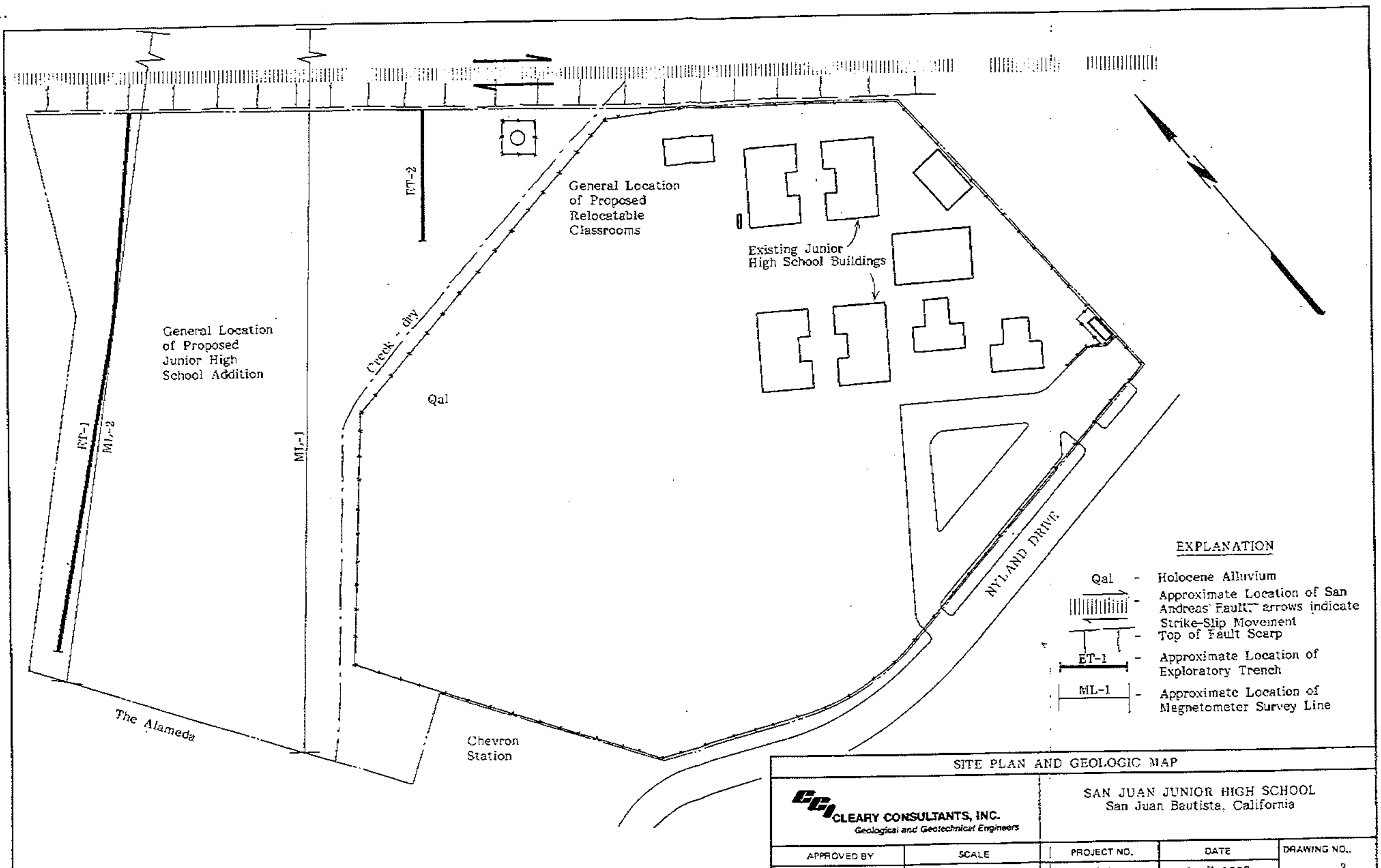
BASE: Dibblee, T.W., Nilsen, T.H. and Brabb, E.E., 1979

REGIONAL GEOLOGIC MAP

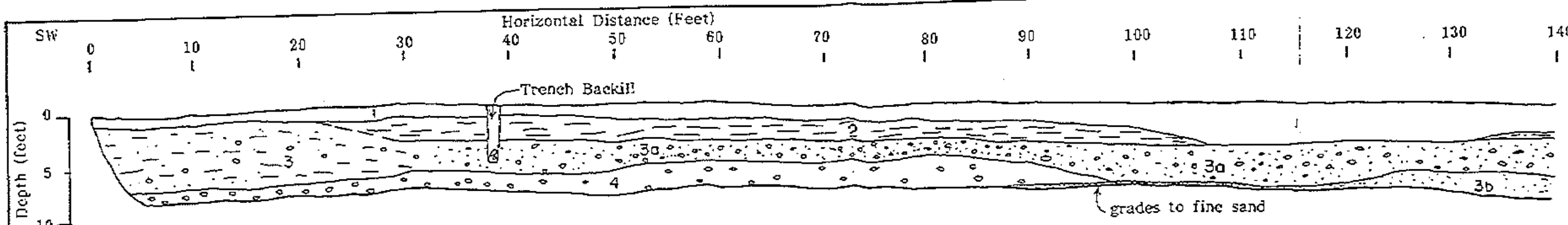
CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

SAN JUAN JUNIOR HIGH SCHOOL
San Juan Bautista, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 2000'	479.1	April 1987	2



Base: Site Plan by Porter-Jensen-Hansen-Manzagol, 4/87



1 Sandy Silt, dark brown, slightly moist, fine sand, fine roots (ML)

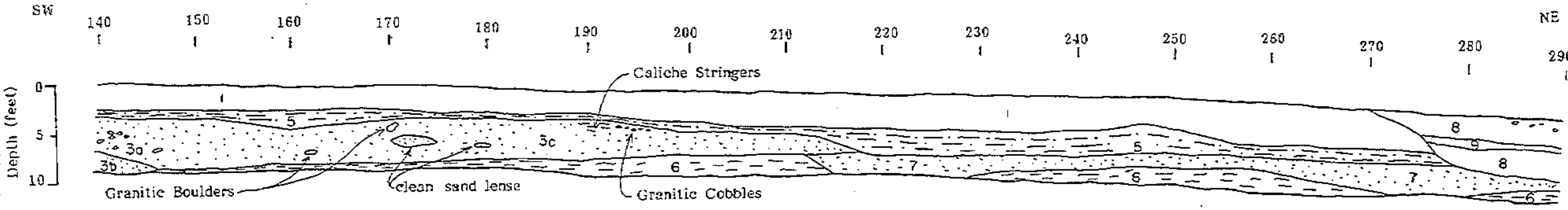
2 Sandy Clay, moist, grey-brown, 10-15% medium sand, very stiff (CL-CH)

3 Clayey Sand, moist, gray-brown, fine sand, scattered gravels, decreasing clay downward (SC)

3a Silty Sand, moist, gray-brown, 15-25% decomposed granite cobbles up to 4", very dense (SM)

3b Sand, moist, orange-brown, medium grained, scattered fine gravels, clean (SP)

3c Sand, moist, yellow-brown, medium dense, coarse sand, trace silt, scattered fine gravels and decomposed granite cobbles (SP)



4 Sand, moist, orange-brown, coarse grained, 20-30% granite cobbles, clean (SP)

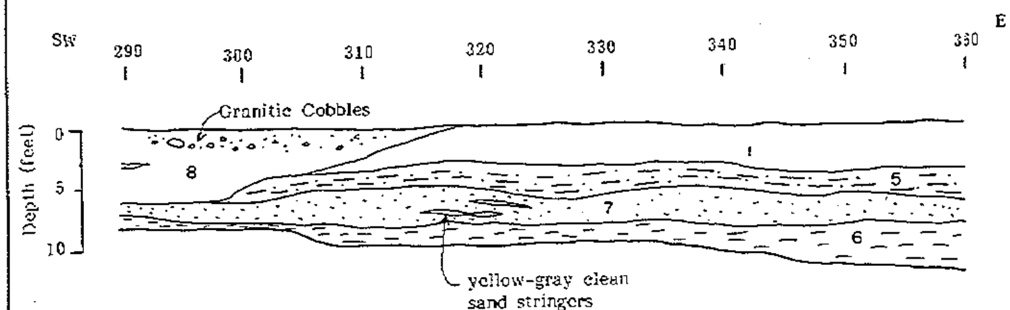
5 Sandy Silt, pale brown to white, moist, clayey, fine to coarse sand, abundant caliche (ML)

6 Sandy Clay, pale brown to yellow brown, fine sand, scattered caliche (CL)

7 Silty Sand, yellow brown, moist, fine sand, caliche nodules (SM)

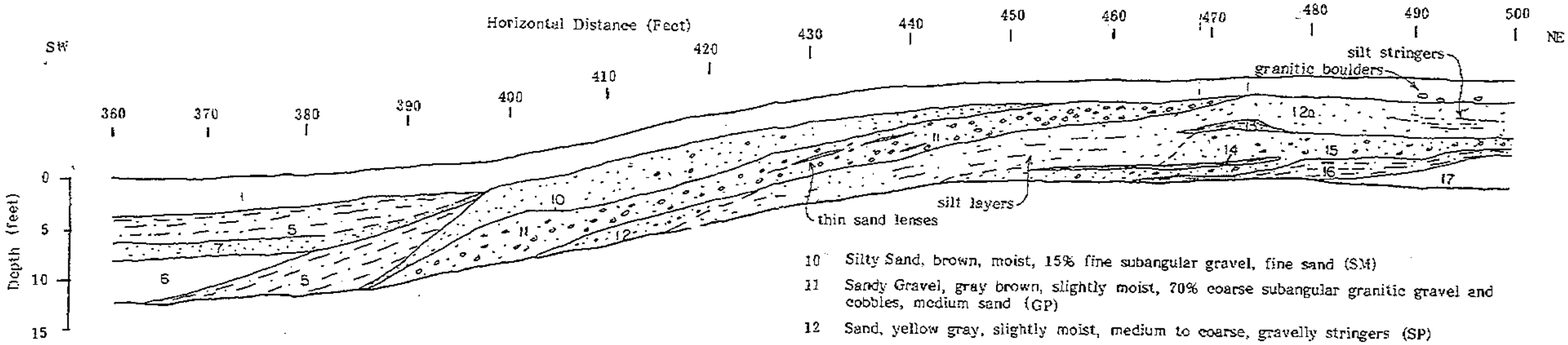
8 Sandy Silt, dark brown, moist, fine to coarse sand, scattered sandstone cobbles in upper 2', wood debris, voids (Fill)(ML)

9 Silty Sand, yellow gray, moist, fine sand (Fill)(SM)



(CONTINUED ON DRAWING NO. 5)

LOG OF EXPLORATORY TRENCH NO. 1				
CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 10'	479.1	April 1987	4



10 Silty Sand, brown, moist, 15% fine subangular gravel, fine sand (SM)

11 Sandy Gravel, gray brown, slightly moist, 70% coarse subangular granitic gravel and cobbles, medium sand (GP)

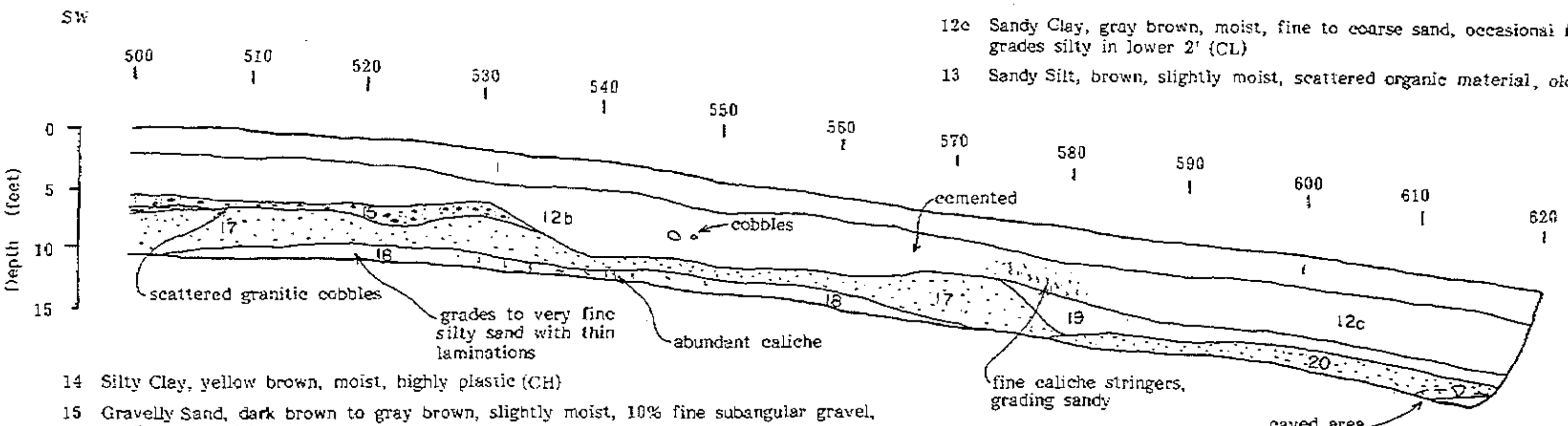
12 Sand, yellow gray, slightly moist, medium to coarse, gravelly stringers (SP)

12a Silty Sand, yellow brown, moist, fine sand, occasional fine subangular gravel, silt stringers (SM-ML)

12b Sandy Silt, brown, slightly moist, 20% coarse to fine sand, trace clay (SM-ML)

12c Sandy Clay, gray brown, moist, fine to coarse sand, occasional fine subangular gravel, grades silty in lower 2' (CL)

13 Sandy Silt, brown, slightly moist, scattered organic material, old topsoil horizon (ML)



14 Silty Clay, yellow brown, moist, highly plastic (CH)

15 Gravelly Sand, dark brown to gray brown, slightly moist, 10% fine subangular gravel, medium sand, friable (SP)

16 Sandy Silt, yellow gray, moist, scattered coarse gravel, fine sand (ML)

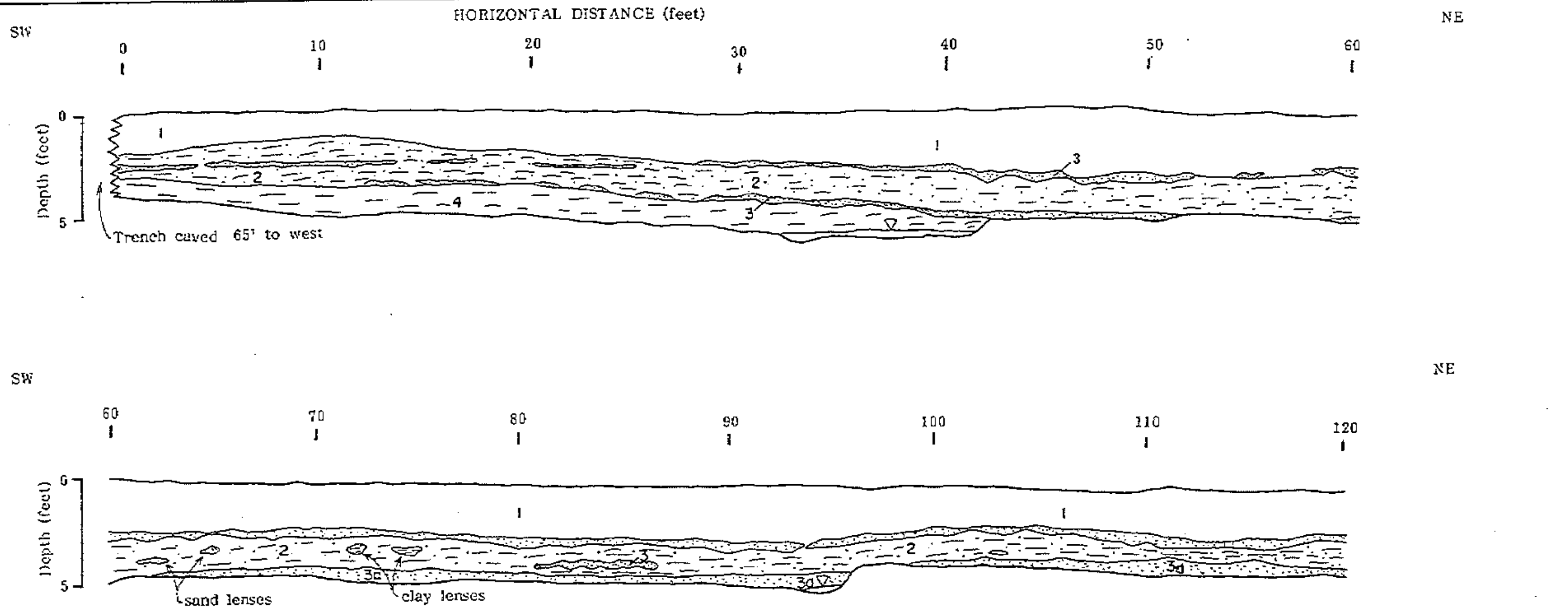
17 Silty Sand, yellow brown, moist, minor fine gravel, fine to coarse sand, scattered caliche (SM)

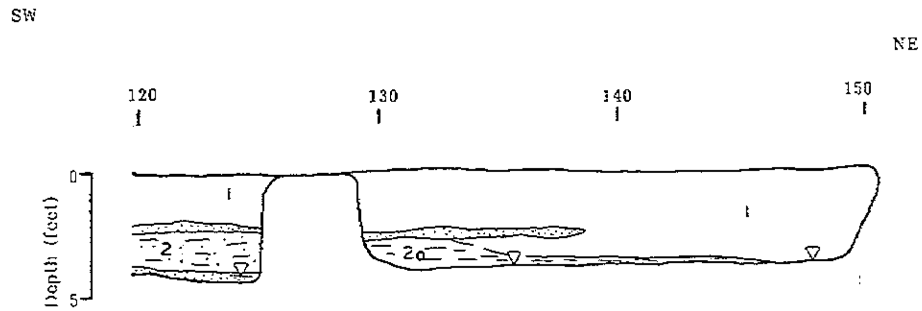
18 Gravelly Sandy Silt, yellow gray to white, 15% fine subangular gravel, fine to coarse sand, abundant caliche (ML)

19 Sandy Silt, yellow gray, moist, 10% fine subangular gravel, fine to coarse sand (ML)

20 Sand, yellow brown, moist, locally saturated, poorly sorted, fine to coarse, scattered granitic gravels and cobbles, minor silt (SM)

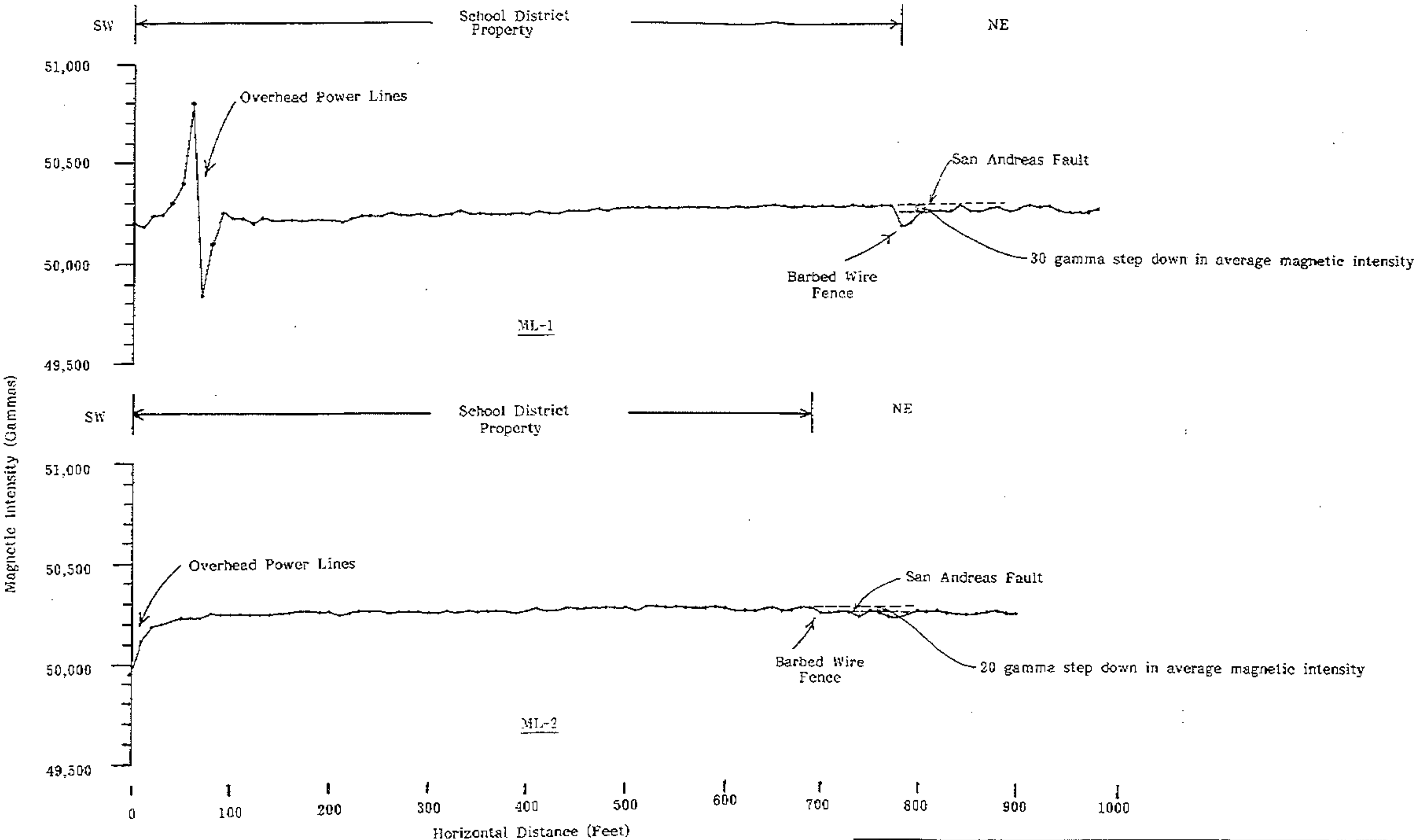
LOG OF EXPLORATORY TRENCH NO. 1				
CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 10'	479.1	April 1987	5





1 Sandy Silt, brown, very moist, fine sand, scattered rounded gravels, firm (ML)
2 Sandy Clay, gray brown, wet, fine sand, sand stringers and pockets (CL)
2a Silty Clay, dark brown, wet, firm (CH)
3 Sand, light brown, clean, coarse grained (SW)
3a Sand, light brown, saturated, clean, coarse (SW)
4 Silty Clay, black, wet, scattered coarse gravels (CH)

LOG OF EXPLORATORY TRENCH NO. 2				
CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	1" = 5'	479.1	April 1987	6



MAGNETOMETER SURVEY LINES 1 AND 2

CLEARY CONSULTANTS, INC. Geological and Geotechnical Engineers		SAN JUAN JUNIOR HIGH SCHOOL San Juan Bautista, California		
APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
JMC	As Shown	479.1	April 1987	7

APPENDIX G

PHOTOGRAPHS

Photograph No. 1: View to east. Office building (Building A).

Photograph No. 2: View to south. Classroom building (northeast corner Building D).

Photograph No. 3: View to southwest. Classroom buildings (Building E on left, Building D on right).

Photograph No. 4: View to east. Classroom building (Building E) on left and kitchen/multi-purpose building on right.

Photograph No. 5: View to south. Play courts and classroom building (Building C) with gymnasium to right.

Photograph No. 6: Play courts (site of proposed multi-purpose building) and gymnasium beyond.

Photograph No. 7: Trench A, View to northeast, east end.

Photograph No. 8: Trench A during excavation. View to southwest.

Photograph No. 9: Trench A, station 133.

Photograph No. 10: Trench A, station 115.

Photograph No. 11: Trench A, station 45.

Photograph No. 12: Trench A, station 6.

Photograph No. 13: Trench B, View to northeast.

Photograph No. 14: Trench B, View to southwest.

Photograph No. 15: Trench B. Station 120.


Photograph No. 16: Trench B. Station 150.

Photograph No. 17: Trench B. Station 250.