

FOR CONTRACT NO.: 03-2F1504

INFORMATION HANDOUT

PERMITS

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
NOTIFICATION NO. 1600-2012-0183-R2

MATERIALS INFORMATION

GEOTECHNICAL DESIGN REPORT

ROUTE: 03-ED-49-30.9/31.3



DEPARTMENT OF FISH AND GAME

Charlton H. Bonham, Director

North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
916-358-2900
www.dfg.ca.gov



Nov. 20th 2012
Date

Erik Schwab
California Department of Transportation
2379 Gateway Oaks Drive, Suite 150
Sacramento, CA 95833
Erik_Schwab@dot.ca.gov

Subject: Final Streambed Alteration Agreement
Notification No. 1600-2012-0183 -R2
Rattlesnake Bar Road Project on SR 49

Dear Mr. Schwab:

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Rattlesnake Bar Road Project on SR 49 (Project). Before the Department of Fish and Game (Department) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, the Department, acting as a lead agency, determined your project is exempt from CEQA and filed a notice of exemption (NOE) on the same date it signed the Agreement.

Under CEQA, filing a NOE starts a 35-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 35-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this matter, please contact Tim Nosal at 916-358-2853 or tnosal@dfg.ca.gov.

Sincerely,

Tina Bartlett
Regional Manager

ec: Tim Nosal
tnosal@dfg.ca.gov

CALIFORNIA DEPARTMENT OF FISH AND GAME
NORTH CENTRAL REGION
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CA 95670



STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2012-0183-R2
Unnamed ephemeral creek

California Department of Transportation
RATTLESNAKE BAR ROAD AT SR 49 PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and California Department of Transportation (Caltrans) (Permittee) as represented by Erik Schwab.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on October 9, 2012 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

PROJECT LOCATION

The project is located at an unnamed tributary to Tent Creek, in the County of El Dorado, State of California; Latitude 38.8417, Longitude -121.0153 or Section 32, Township 8N, Range 9E U.S. Geological Survey (USGS) map Garden Valley, Mount Diablo base and meridian (Attachment A *Project Map*).

PROJECT DESCRIPTION

The project proposes to install a left-turn channelization and a short two-way left-turn lane, between post miles (PM) 30.95 and 31.25. The project will also update drainage features, relocate two existing telephone poles, reconstruct an existing private driveway, replace signage and striping and provide adequate temporary and permanent erosion control. The drainage features to be updated include the following:

- ▶ An existing 18-inch corrugated steel pipe (CSP) cross culvert at PM 31.25 carries water from the west side of SR49 to the east side, and it outflows into an ephemeral creek. This CSP will be extended to match the width of the new roadway.
- ▶ A 12-inch CSP located under Rattlesnake Bar Road will be upgraded to an 18-inch CSP.
- ▶ A private driveway located across from Rattlesnake Bar Road will be reconstructed and a 12-inch CSP will be installed under the driveway.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: nesting migratory birds, and other terrestrial plant and wildlife species.

The adverse effects the project could have on the fish or wildlife resources identified above include: increased sedimentation from adjacent construction; short-term release of sediment (e.g. incidental from construction); loss or decline of wetland habitat; disturbance from project activity; direct take of terrestrial species; loss of natural bed or bank; and disruption to nesting birds and other wildlife.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to DFG personnel, or personnel from another state, federal, or local agency upon request.
- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

- 1.3 Notification of Conflicting Provisions. Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that DFG personnel may enter the project site at any time to verify compliance with the Agreement.
- 1.5 Notification of Project Modification. Permittee agrees to notify DFG of any modifications made to the project plans submitted to DFG.

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

- 2.1 Work Period. The time period for completing the work within the stream zone shall be restricted to periods of low stream flow and dry weather and shall be confined to the period of June 15 to October 15. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities within the stream zone shall cease until all reasonable erosion control measures, inside and outside of the stream zone, have been implemented prior to all storm events. Revegetation, restoration and erosion control work is not confined to this time period.
- 2.2 Work Period Extensions. At DFG's discretion, the work period may be extended based on the extent of the work remaining, on site conditions and reasonably anticipated future conditions (e.g. weather). If the Permittee finds more time is needed to complete the authorized activity, the Permittee shall submit a written request for a work period time extension to DFG. The work period extension request shall provide the following information: 1) Describe the extent of work already completed; 2) Provide specific detail of the activities that remain to be completed within the stream zone; and 3) Detail the actual time required to complete each of the remaining activities within the stream zone. The work period extension request should consider the effects of increased stream conditions, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control grasses due to cool weather. Photographs of the work completed and the proposed work areas are helpful in assisting DFG in its evaluation. Time extensions are issued at the discretion of DFG. DFG will have ten calendar days to approve the proposed work period extension. DFG reserves the right to require additional measures designed to protect natural resources. DFG will not consider requests made more than two weeks prior to end of the work period.

- 2.3 Stream Diversions / Dewatering. If work in the flowing portion of the stream is unavoidable, the entire stream flow shall be diverted around or through the work area during the excavation and/or construction operations. Stream flow shall be diverted using gravity flow through temporary culverts/pipes or pumped around the work site with the use of hoses. When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain aquatic life below the dam pursuant to Fish and Game Code section 5937. Any temporary dam or other artificial obstruction constructed shall only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which will cause little or no siltation.
- 2.4 Bird Nests. It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the Fish and Game Code. No trees that contain active nests of birds shall be disturbed until all eggs have hatched and young birds have fledged without prior consultation and approval of a Department representative.
- 2.5 Vegetation Removal. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Except for the trees specifically identified for removal in the notification, no native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged without prior consultation and approval of a Department representative. Using hand tools (clippers, chain saw, etc.), trees may be trimmed to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.
- 2.6 Sediment Control. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Monofilament mesh, jute netting and non-biodegradable synthetic erosion blankets are not authorized. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged siltation barriers. The Permittee is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season). Upon Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective Department approved control devices are installed or abatement procedures are initiated.

- 2.7 **Pollution Control.** Utilize Best Management Practices (BMPs) to prevent spills and leaks into water bodies. If maintenance or refueling of vehicles or equipment must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. Ensure that all vehicles and equipment are in good working order (no leaks). Place drip pans or absorbent materials under vehicles and equipment when not in use. Ensure that all construction areas have proper spill clean up materials (absorbent pads, sealed containers, booms, etc.) to contain the movement of any spilled substances. Any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake by the Applicant or any party working under contract or with the permission of the Permittee, shall be removed immediately. DFG shall be notified immediately by the Permittee of any spills and shall be consulted regarding clean-up procedures.

3. Reporting Measures

Permittee shall meet each reporting requirement described below.

- 3.1 The Permittee shall notify DFG within two working days of beginning work within the unnamed seasonal tributary to Tent Creek. Notification shall be submitted as instructed in Contact Information section below. Email notification is preferred.
- 3.2 Upon completion of the project activities described in this agreement, the work area within the unnamed tributary shall be digitally photographed. Photographs and a notification of project completion shall be submitted to DFG within fifteen days of completion. Photographs and a notification of project completion shall be submitted as instructed in Contact Information section below. Email submittal is preferred.

CONTACT INFORMATION

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other.

To Permittee:

Erik Schwab
California Department of Transportation

2379 Gateway Oaks, Suite 150
Sacramento, CA 95833

[Fax] (916) 274-0602
[Email] Erik_Schwab@dot.ca.gov

To DFG:

Department of Fish and Game
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
Attn: Lake and Streambed Alteration Program – Tim Nosal
Notification #1600-2012-0183 R2

Fax: 916-358-2912
Email: r2lsa@dfg.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 *et seq.* (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

DFG may amend the Agreement at any time during its term if DFG determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective,

unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)).

EFFECTIVE DATE

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire within five (5) years of DFG's signature, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

EXHIBITS

The documents listed below are included as exhibits to the Agreement and incorporated herein by reference.

Attachment A: Project Map

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify DFG in accordance with FGC section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

FOR CALTRANS



Erik Schwab

Associate Environmental Planner

11-15-12

Date

FOR DEPARTMENT OF FISH AND GAME



Tina Bartlett

Regional Manager

11-20-12

Date

Prepared by: Tim Nosal
Environmental Scientist

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. STEVEN WRIGHT
DESIGN CHIEF, TRAFFIC DESIGN
BRANCH 03-0399

ATTN: MR. Eric Souza

Date: July 17, 2012

File: 03-ED-49-
PM31.0/31.2
EA 03-2F1500
EFIS 0300020538
RATTLESNAKE
BAR ROAD

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Geotechnical Design Report

Introduction

Per the request of District 3 Traffic Design Branch 03-0399, a Geotechnical Design Report has been prepared for the Rattlesnake Bar Road Project (EA 03-2F150). The purpose of this project is to construct a left-hand turn channelization lane for northbound vehicles on Route 49, at the intersection of Rattlesnake Bar Road and Route 49 (at PM 31.12) near the town of Pilot Hill, in El Dorado County. (See Plate No. 1)

Existing Facilities and Proposed Improvements

Within the project limits, the subject section of Route 49 is roughly oriented north-to-south and is composed of an asphalt concrete-paved, two-lane roadway with paved-shoulder widths of roughly 2 feet. Rattlesnake Bar Road (designated as “B” Line) intersects Route 49 (designated as the “A” Line) from the west at about “A” Line STA 18+20. A residential driveway approaches from the east, opposite of Rattlesnake Bar Road. A small, commercial complex is situated on the southwesterly corner of the intersection of Rattlesnake Bar Road and Route 49; access to the commercial facility is from Route 49. Overhead utility/power lines stretch parallel to the highway along the easterly fenced-property boundary, atop existing cut slopes. (See Photo No. 4)

The propose project will incorporate new cuts and embankment fill on the easterly side of the highway to accommodate facility widening for a left-hand turn lane onto Rattlesnake

Bar Road. Based on information and plans provided by District 3 Traffic Design, it is anticipated that the widening will produce new cuts into existing cut slopes easterly of the highway. The proposed cut slopes will reportedly extend as high as 15 feet and be sloped at ratios ranging from 2H:1V to 1.5H:1V, with the steeper cut slope ratio of 1.5H:1V proposed at locations where the proposed cut slopes encroach upon the existing overhead power/utility poles. The quantity of excavated materials was estimated around 6,000 cubic yards. Proposed embankment fill slopes are to extend as high as 10 feet and will be sloped at ratios ranging from 4H:1V to 2H:1V; most new embankment construction is anticipated to be comprised of sliver fills. Project plans indicate a perforated metal pipe (PMP) underdrain is proposed to diagonally across the highway at the Rattlesnake Bar Road intersection and continue south (down gradient) along the easterly edge of the highway. We understand that the purpose of the underdrain will be to intersect and carry out near-surface groundwater (both perched and flowing) atop the bedrock surface. The diagonal underdrain crossing prior to Rattlesnake Bar Road would serve to cut-off and re-direct subgrade water effecting the westerly Route 49 shoulder at Rattlesnake Bar Road and the commercial facility entrance (see "Field Investigation" section).

Pertinent Reports and Investigations

The following maps and other sources of published information were utilized in the preparation of this report:

- "General Geologic Map of El Dorado County, California", June, 2001
- "Areas More Likely To Contain Natural Occurrences Of Asbestos In Western El Dorado County, California", published by the Department of Conservation, Division of Mines and Geology, 2000
- United States Department of Agriculture (USDA) soil survey web site: <http://websoilsurvey.nrcs.usda.gov/app/>; April 2012
- Western Regional Climate Data Center web site: <http://www.wrcc.dri.edu/>
- Caltrans ARS Online (v1.0.4) http://dap3.dot.ca.gov/shake_stable/

Physical Setting

Climate

The closest operating weather station is in the town of Cool, about 4 miles north of the

project site. Data maintained on the Western Regional Climate Center website for the period from 1971 to 2000 indicates an average total precipitation of 29.7 inches at this station. According to data from the United States Department of Agriculture Soil Survey website, the frost-free period is 175 to 275 days. The area normally receives little to no snowfall. Hot, dry summers and wet, cool winters are typical. The mean maximum and minimum temperatures range from 92° F to 32° F.

Topography and Drainage

Within the project limits, Highway 49 follows a north-south trending surface water drainage. This stretch of highway crosses through grass-covered, gently-rolling terrain. The area is composed of rural open space with the exception of a relatively small commercial property of businesses adjacent westerly of the highway, just south of Rattlesnake Bar Road.

Regional Geology, Faults and Seismicity

The project site is located in the Sierra Nevada geomorphic province. According to the “General Geologic Map of El Dorado County, California”, the site is underlain predominantly by metavolcanic rocks (mv). (See Plate No. 2a)

Surface rupture, ground shaking, subsidence and liquefaction are seismically induced hazards that may result from moderate to major earthquake events. According to Caltrans ARS Online (V2.0), the nearest active fault is the Foothills Fault System, with the surface trace located approximately 0.5 miles easterly of the project site. ARS Online considers this fault as the controlling fault, and assigns a MMax of 6.5 with a resulting peak ground acceleration of 0.42g at the site (for a “soft rock” V_{S30} condition of 760 m/s). No known active or inactive faults traverse the project limits. Based on review of available fault mapping (see Plate No. 2a, scale of 1:100,000), the closest fault surface trace is roughly 500 feet easterly of the site, and appears to be a splay of the Foothills Fault System. Based on our findings, the potential for damage or collapse associated with fault surface rupturing, seismically induced ground subsidence, or liquefaction is considered low.

Soil Survey Mapping

As described by the USDA soil survey web site, these units include:

AwD, Auburn silt loam, shallow loam with 14 to 18 inches to unweathered bedrock

Naturally Occurring Asbestos (NOA)

According to the California Department of Conservation asbestos map for Western El Dorado County, the project site is in an “area that probably does not contain asbestos”. (See Plate No. 3) During our site visits, serpentine rock was not observed on the ground surface on the site or in nearby rock exposures in cut slopes.

Field Investigation

During our site reconnaissance on April 19, 2012, the near surface materials at the project site were generally noted to be composed of residual, soil-like, silt, sand and gravel materials overlying metavolcanic (mv) formational rock. Penetration probing with a metal hand probe, particularly at the top of the existing cut slopes, revealed practical refusal at shallow depths, indicating the top of the underlying formational rock surface to be undulating between 0 and 4 feet below the existing ground surface. This observation is relatively consistent with the USDA online soil survey description. Many of the probed locations appeared saturated, which is likely due to recent rain and the poor drainage offered by the shallow depth of rock.

The existing 2H:1V cut slopes in areas proposed for cut slope modifications appeared to be performing well with no notable signs of distress, and appeared generally absent of relatively harder rock exposures. Westerly left of STA “A1” approximately 21+00, hard metavolcanic rock was observed on the existing 10 feet high, 0.5H:1V cut slope, suggesting near-surface hard rock is locally present. (See Plate No. 4)

During our site reconnaissance, two utility poles (Pole # 4419 and #4439), located on the top of the proposed cut slope locations easterly of the highway, appeared to not be plumb. Measurements with hand-held level instruments along the base of the poles revealed the poles to be plumb at the base, with the exception of the pole with a tag plate identification of “4419”, which was noted to be leaning at about 3 degrees towards the highway. Based on these field measurements and our observations, it is concluded that the pole columns are not straight and may be bending due to the eccentric loading from the weight of utility lines.

During our site reconnaissance on April 19, 2012, saturated soil from ponding of surface water due to shallow bedrock was observed at the south east corner of the Rattlesnake Bar Road. (See Plate No. 5) Also, there seem to be evidence of previous pavement repairs which is likely due to perched water in the subgrade soil at the shoulder of the south bound lane at the Rattlesnake Bar Road intersection.

Geotechnical Recommendations

Based on our findings, the proposed cut slope ratio of no steeper than 1.5H:1V appears acceptable and fill slope ratio is adequate. The use of on-site materials from the excavation for the proposed fill slopes is acceptable for constructing fill slopes at no steeper than 2H:1V.

Construction Considerations

Based on our site review and reconnaissance, it is our opinion that the underlying formational rock is mostly rippable. Although harder rock was not noted on the easterly side of the highway where the cut slopes are proposed, the harder rock observed on the cut slope at left of STA "A1" 21+00 is an indication that non-rippable material could likely be present at relatively shallow depth, and hard rock excavation techniques will be required to complete the proposed cut excavations. Typical hard rock excavation methods consist of blasting, the use of hoe-rams, hydrologic splitters and chemical expanders. We estimate the percentage of the total excavations that will require hard rock excavation techniques is approximately 15% ($\pm 5\%$) by volume. The contractor may be aware of other methods for excavation of hard rock that may be suitable for this project. Should the contractor desire to utilize a method other than the methods mentioned in this report, the method should be presented to the Resident Engineer for approval.

Due to the relatively small volume estimated for hard rock excavation, the close proximity of buildings, and the extremely close proximity of the overhead utility/power poles to the proposed cut locations, our Office recommends that blasting not be allowed during project construction. Caltrans Standard Special Provision (SSP) 19-4 "Rock Excavation" should be utilized in project specifications with the "blasting" provision removed. If the District approves blasting as a hard rock excavation method, our Office recommends that the previously mentioned Caltrans SSP be replaced with Caltrans SSP 19-4 "Rock Excavation (Controlled Blasting)".

Perched groundwater and saturated soils should be expected to be encountered atop the underlying formational rock. This condition would be more likely to be encountered during the rainy season, but should be expected for a significant time into the dry season. If perched groundwater or near-surface water is encountered, sump pumps may be required to facilitate construction, particularly in the proposed PMP underdrain trenches. In addition, excessively wet (over-optimum) soil conditions can make proper compaction of fill materials difficult or impractical.

Depending on the depth proposed for the PMP underdrain, rock trenching should be

anticipated for installation of the PMP underdrain.

Project Information

Standard Special Provision S5-280, "Project Information," discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and Information included in the Information Handout provided to the bidders and Contractors are:

Data and Information available for inspection at the District Office:

A. *None*

Data and Information included in the Information Handout provided to the bidders and Contractors are:

A. *"Geotechnical Design Report for Rattle Snake Bar Road", 03-ED-49-PM 31.0/31.2, dated May 1, 2012.*

Data and Information available for inspection at the District Office:

A. *None*

Data and Information available for inspection at the Transportation Laboratory are:

A. *None*

MR. STEVEN WRIGHT
July 17, 2012
Page 7

RATTLESNAKE BAR RD
03-ED-49-PM 31.0/31.2
03-2F1500

The recommendations provided are based on specific project information regarding site location, proposed slope cut and fill slope ratios and site conditions. If any conceptual changes are made and or if the site and subsurface conditions have changed from those described in this report, the Office of Geotechnical Design-North should review those changes and determine if the recommendations provided herein are still applicable.

Any questions should be directed to the attention of Luke Leong (916) 227-1081 of the Office of Geotechnical Design – North.



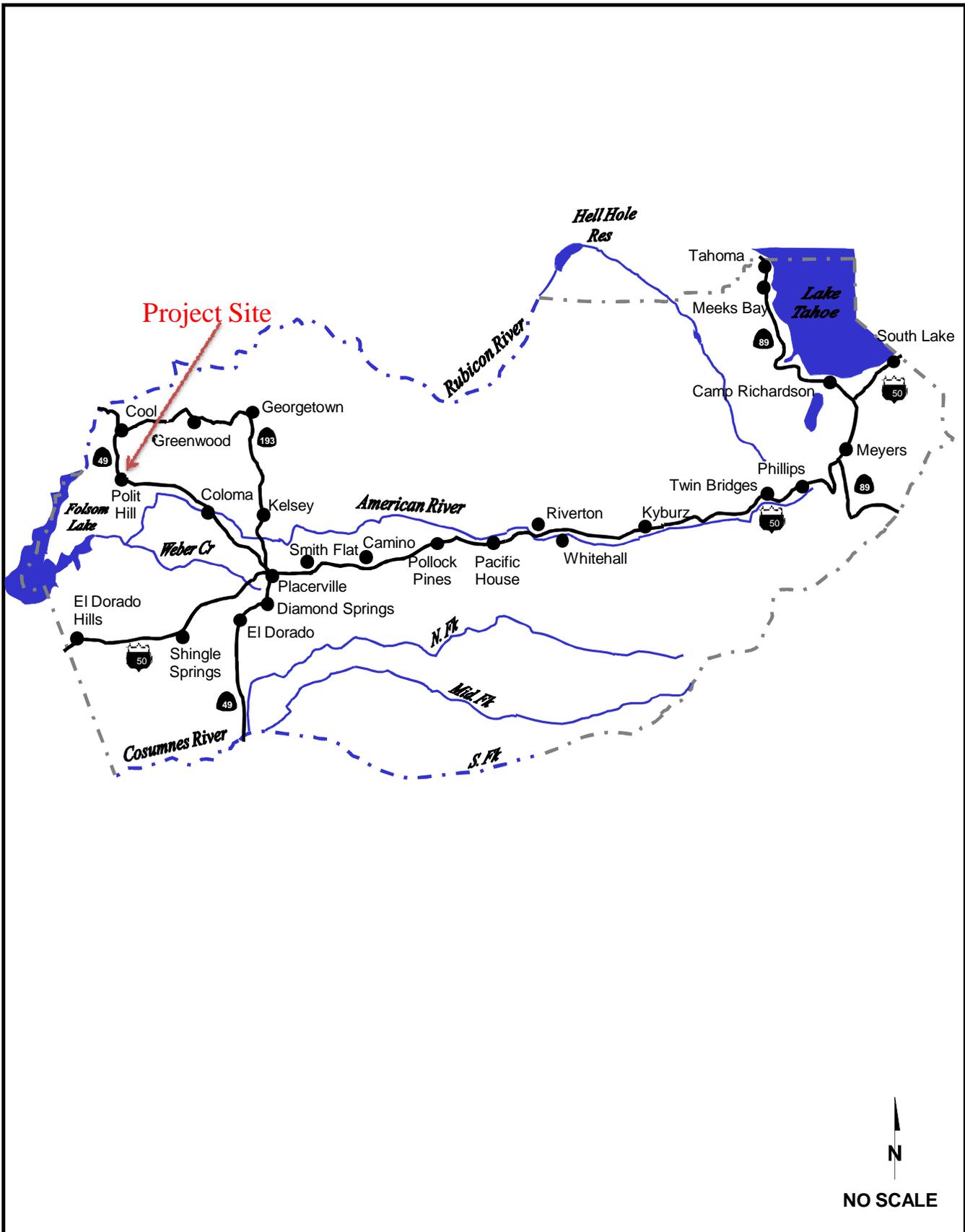
LUKE LEONG, P.E.
Transportation Engineer – Civil
Geotechnical Design – North



Attachments:

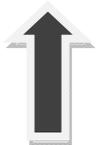
- Plate 1a. Vicinity Map
- Plate 1b. Site Map
- Plate 2a. General Geologic Map of El Dorado County, CA
- Plate 2b. Explanation of Geologic Units
- Plate 3a. Asbestos Map of Western El Dorado County
- Plate 3b. Asbestos Map Legend
- Plate 4. Photograph
- Plate 5. Photograph
- Plate 6. Photograph

- c: MarkHagy, (OGDN)
GDN File
DME - Dan Ferchaud
PM – Sutha Nadarajah



CALTRANS
 Engineering Services
 Office of Geotechnical Services
 Geotechnical Design Branch - North

EA: 03-2F150	VICINITY MAP
Date: 05/01/12	
03-ED-49-PM 31.0/31.2	
Geotechnical Design Report	PLATE NO. 1a



North
No Scale



CALTRANS
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design -
North

EA: 03-2F150

Date: May 1, 2012

SITE MAP

**03-ED-49-PM 31.0/31.2
Geotechnical Design Report**

Plate No.
1b

121°07'30"
39°00'

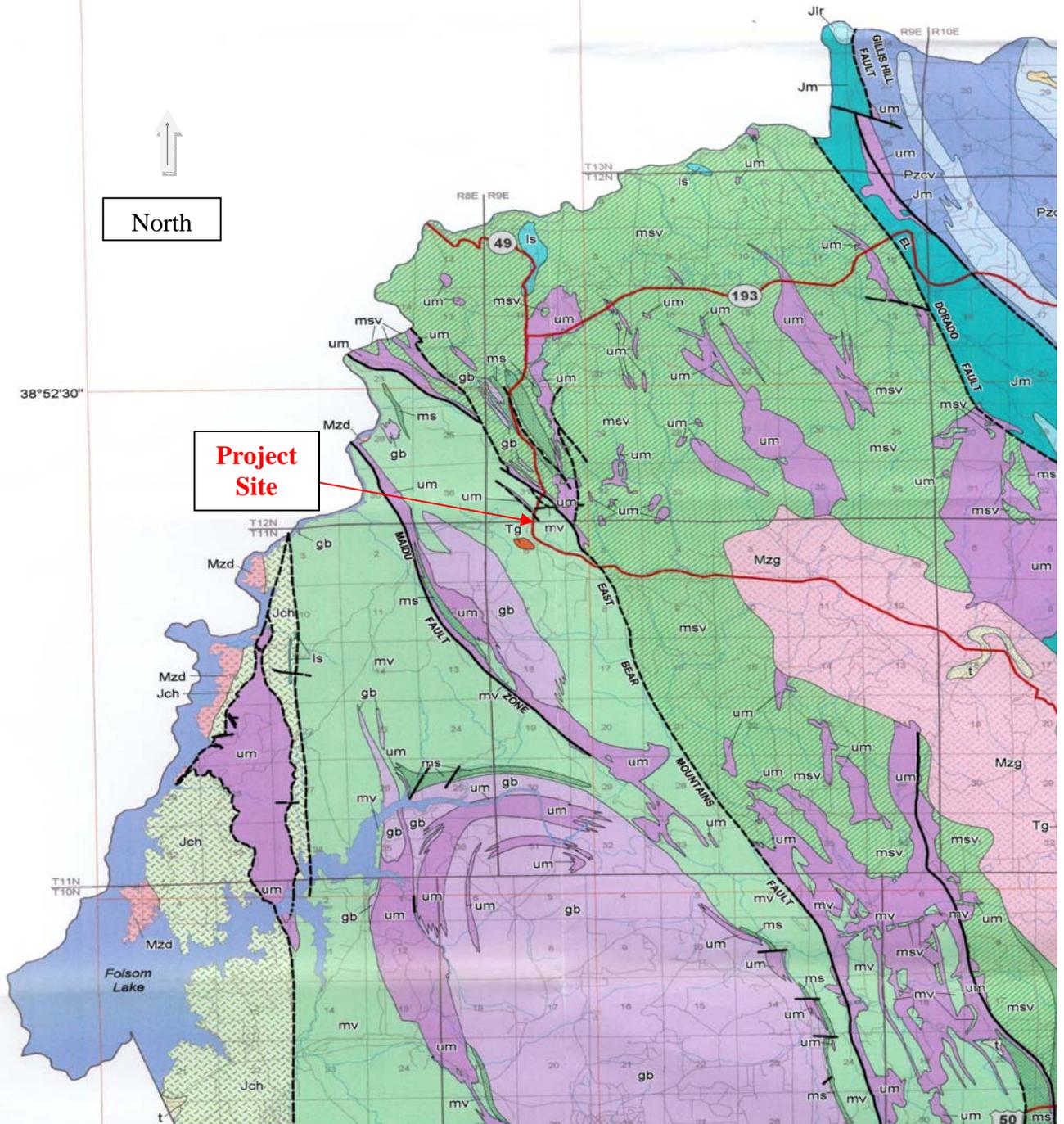
121°00'



North

38°52'30"

Project Site



See Plate 2b for legend.



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design -
 North

EA: 03-2F150

Date: May 1, 2012

GEOLOGY MAP

03-ED-49-PM 31.0/31.2
Geotechnical Design Report

Plate No.
 2a

EXPLANATION OF GEOLOGIC UNITS

UNIT	NAME	AGE	DESCRIPTION
t	Tailings	Recent	Dredge tailings.
Qal	Alluvium	Quaternary	Alluvium.
Qg	Glacial deposits	Quaternary	Glacial moraine deposits.
Qv	Volcanics	Quaternary	Predominantly basalt in the Robbs Peak quadrangle.
Tm	Mehrtens Formation	Tertiary	Stream channel, alluvial and mudflow deposits derived mainly from andesitic volcanic rocks.
Tvs	Valley Springs Formation	Tertiary	Stream channel and alluvial deposits derived mainly from rhyolitic volcanics. Also includes white welded tuff and ash flows.
Tg	River channel deposits (Auriferous Gravel)	Tertiary	Tertiary river channel deposits; sand, silt, and gravel.
Mzg	Granitic intrusive rock, chiefly granodiorite	Mesozoic	Predominantly granite to granodiorite.
Mzd	Dioritic intrusive rocks	Mesozoic	Predominantly quartz and quartz diorite. May include basic intrusive and gabbroic rocks in eastern areas of the county.
gb	Gabbro	Mesozoic	Gabbro and/or porphyritic greenstone.
Jes	Salt Springs Slate	Jurassic	Mostly dark gray slate with subordinate tuff, graywacke, and rare conglomerate.
Jbh	Copper Hill Volcanics	Late Middle Jurassic	Mostly mafic to andesitic pyroclastic rocks, lava, and pillow lava; subordinate felsic porphyritic and pyroclastic rocks.
Jm	Mariposa Formation	Jurassic	Dark gray slate with subordinate tuff, graywacke, and conglomerate.
Jmb	Mariposa Formation, Bower Creek Member	Jurassic	Dark green mafic volcanic breccia.
Jgo	Gopher Ridge Volcanics	Jurassic	Mafic to andesitic pyroclastic rocks, lava, and pillow lava subordinate; felsic porphyritic and pyroclastic rocks.
Jlr	Logtown Ridge Formation	Late Middle Jurassic	Augite and basaltic andesites, tuff-breccias, and pillow lavas.
Jtl	Tuttle Lake Formation	Middle Jurassic	Metamorphosed arc deposits (tuffaceous matrix supported andesite-clast turbidites).
Jsc	Sailor Canyon Formation	Jurassic	Metamorphosed arc deposits (andesitic tuffaceous rocks with interbedded sandstones and slates).
Jmu	Metamorphic rocks, undifferentiated	Jurassic	Metasediments and metavolcanics, probably Tuttle Lake or Sailor Canyon Formations.
PzMz	Paleozoic-Mesozoic metamorphic rocks	Paleozoic-Mesozoic	Paleozoic-Mesozoic metamorphic rocks within the Melones Fault Zone.
um	Ultramafic rocks	Paleozoic(?) - Mesozoic(?)	Partly to completely serpentinized; locally includes gabbroic and other rocks.
ls	Limestone	Paleozoic-Mesozoic	Limestone, marble.
Pzcc	Calaveras Complex (metasedimentary rocks)	Upper Paleozoic-Lower Mesozoic (?)	Typically thinly bedded argillite, chert, and massive metasilstone.
Pzcv	Calaveras Complex (metavolcanic rocks)	Upper Paleozoic-Lower Mesozoic (?)	Andesite tuff, breccia, and basalt flows.
ms	Metasedimentary	Paleozoic?	Metasedimentary rocks.
mv	Metavolcanic	Paleozoic?	Metavolcanic rocks.
msv	Metasedimentary and metavolcanic	Paleozoic?	Metasedimentary and metavolcanic rocks.
Pzsf	Shoo Fly Complex	Early to Middle Paleozoic	Highly deformed miogeosynclinal deposits composed predominantly of quartzofeldspathic schist and gneiss.

GEOLOGIC SYMBOLS

- Geologic contact
- Fault; solid where located, dashed where inferred.



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design -
 North

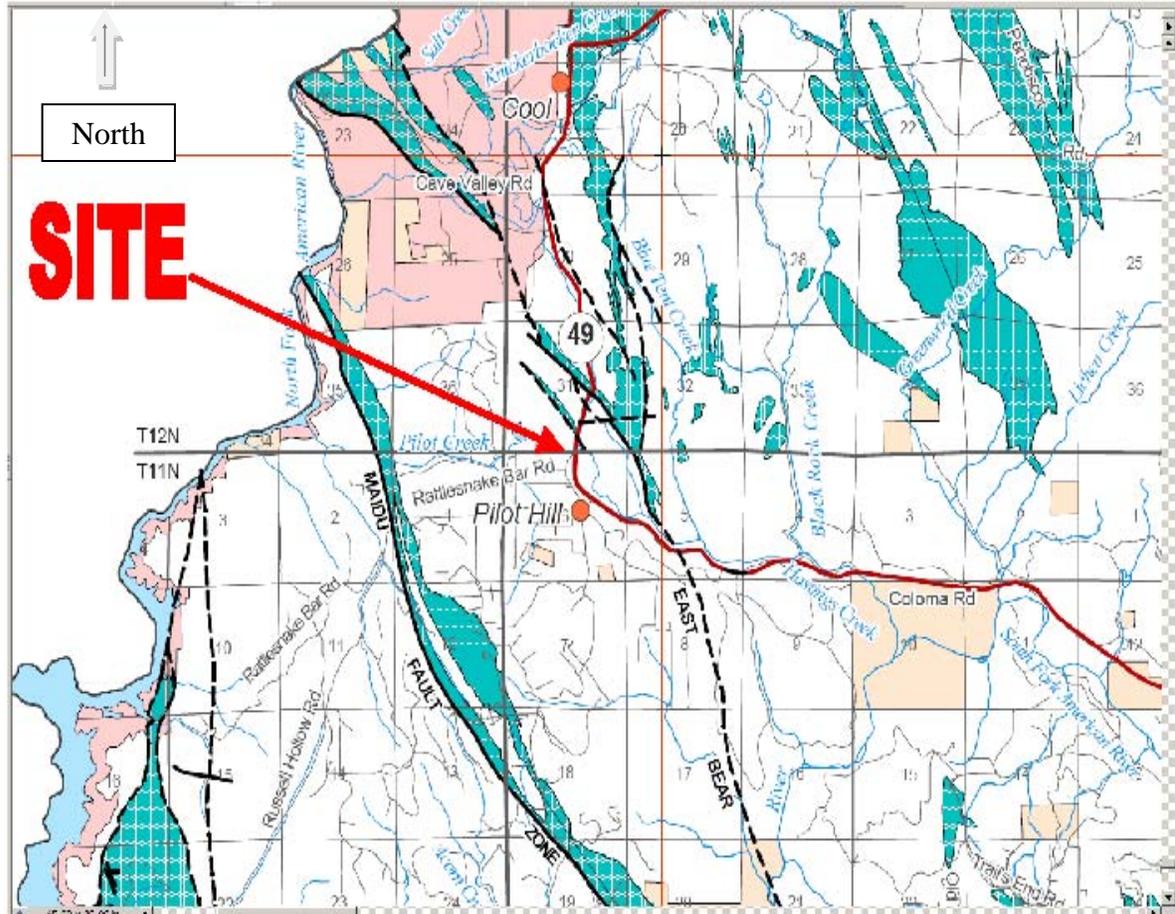
EA: 03-2F150

Date: May 1, 2012

GEOLOGY MAP LEGEND

03-ED-49-PM 31.0/31.2
Geotechnical Design Report

Plate No.
 2b



See Plate 3b for legend.



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design -
 North

EA: 03-2F150

Date: May 1, 2012

ASBESTOS MAP

03-ED-49-PM 31.0/31.2
 Geotechnical Design Report

Plate No.
 3a

Areas More Likely to Contain Natural Occurrences of Asbestos in Western El Dorado County, California

by
Ronald K. Churchill
 March 2000

EXPLANATION

The rocks exposed in western El Dorado County are predominantly metamorphic rocks formed at high temperatures and pressures at depth by recrystallization of sedimentary rocks (shales, carbonates and sandstones) and igneous rocks derived from melts. Metamorphism of any of several related high magnesium and high iron igneous rock types, collectively called ultramafic rocks, may result in the formation of serpentinite.

Areas More Likely To Contain Asbestos

These areas primarily consist of serpentinite (serpentine rock) and related ultramafic rocks and soils, and are the most likely locations for natural occurrences of asbestos in El Dorado County. However, many locations within these areas may contain relatively little or no asbestos. Given existing information, prediction of asbestos occurrences at specific locations within this map unit is not possible. Determining whether asbestos is present or absent at a particular site will require a detailed geologic examination of that site.

Additional Technical Information on Ultramafic Rocks: Both chrysotile asbestos and tremolite/actinolite² (amphibole) asbestos may occur in association with serpentinite and partially serpentinitized ultramafic rocks in El Dorado County. Tremolite/actinolite in rocks may or may not be present as fibrous asbestos. Asbestos occurrences typically consist of single to numerous small veins and pods, most often less than one to two inches in width. Less commonly, veins up to several feet in width may be present. Some of the areas in this map category contain talc schist³. Talc schist may form by hydrothermal (hot water) alteration of ultramafic rocks or serpentinite and may contain asbestos. Non-ultramafic rocks, such as gabbro⁴ or diorite⁵, may be locally present within this map unit in some areas. These non-ultramafic rocks typically contain little or no asbestos. Serpentinite related soils included within this map unit are "Serpentine rock land" and "Delpiedra soil", as defined by the U.S. Department of Agriculture Soil Conservation Service. Sediments along creeks and streams below serpentinite areas have not been identified as areas with asbestos potential. Many of these sediment deposits are too small to depict on this map. Such sediment deposits may contain asbestos, but no studies of asbestos in stream sediment in El Dorado County were found during research for this mapping project. DOC/DMG has not tested these deposits for asbestos.

Areas Where The Presence Of Asbestos Is Possible But Unlikely

Metamorphic processes have altered some of the igneous rocks of the Pine Hill Intrusive Complex. In portions of these altered igneous rocks, called altered gabbro, tremolite/actinolite amphibole has been found. The tremolite/actinolite reported in these altered areas has been described in a previous study (Springer, 1971) as having crystals acicular (needle-like) in form. However, because of limitations in this previous study, a very small possibility exists that small amounts of fibrous tremolite/actinolite (asbestos) may be present within this unit.

Additional Technical Information on Altered Gabbro: A previous research study (Springer, 1971), identified portions of the Pine Hill Intrusive Complex rocks as "altered gabbro" if more than 10 percent of the original plagioclase present was altered to epidote by deuteric processes. Acicular, colorless to pale green tremolite/actinolite is one of the water-bearing and silicate-bearing minerals often present in this altered gabbro, usually in amounts ranging between 0 and 3 percent. "Acicular tremolite/actinolite" means needle-like tremolite/actinolite crystals. However, the possibility that a small amount of this tremolite/actinolite may actually be fibrous (asbestos) exists for several reasons. The previous study may not have always been consistent in distinguishing between "acicular" and "fibrous" tremolite/actinolite (Springer, 1999, written communication). Such detail would have been inconsequential for the purposes of that investigation, and the investigation occurred before natural occurrences of asbestos became an environmental issue. Also, the microscopic method employed is not normally used for asbestos identification. The potential for tremolite/actinolite asbestos is believed to be much lower in the Pine Hill Intrusive Complex altered gabbro than in serpentinite areas. Possibly it is not different than for the map category "Areas That Probably Do Not Contain Asbestos". However, because of the small uncertainty in the available information, the approximate locations of altered gabbro within the Pine Hill Intrusive Complex have been shown on the map.

FOOTNOTES:

1. Asbestos: A term referring to the asbestiform (fibrous) varieties of the minerals chrysotile, tremolite, actinolite, crocidolite, anthophyllite, and amosite (summingtonite-prunierite). The most common type of asbestos found in California is chrysotile, a serpentine mineral.
2. Tremolite/actinolite: Tremolite and actinolite are closely related amphibole minerals, and this term is used to jointly refer to them or in situations where it is uncertain which one is present. Tremolite is a white to dark gray mineral that occurs in long blade-shaped or short about prismatic crystals and in columnar, fibrous (asbestos) or granular masses or compact aggregates. Actinolite is a common rock-forming mineral, typically green in color, that occurs in prismatic or acicular (needle-like) form and less commonly in fibrous form (asbestos).
3. Talc schist: A metamorphic rock (schist) composed primarily of the mineral talc.
4. Gabbro: A dark-colored plutonic (igneous) rock principally composed of the minerals plagioclase and augite.
5. Diorite: A group of plutonic (igneous) rocks characteristically composed of dark-colored amphibole minerals such as hornblende and the minerals plagioclase feldspar, pyroxene, and sometimes a small amount of quartz.

Areas That Probably Do Not Contain Asbestos

(This category may be colored white or any of the land ownership category colors shown below. In other words, it may be any color except the color used to indicate "Areas Most Likely To Contain Asbestos").

These areas generally have little or no serpentinite, ultramafic rocks or related soils. Generally, asbestos rarely occurs in these areas except in or near fault zones.

Additional Technical Information: Metamorphic rocks away from fault zones, non-metamorphic rocks, granitic intrusive rocks, and their related soils usually have few, if any, asbestos occurrences. Most carbonate rock occurrences in El Dorado County are included in this category. Asbestos occurrences have been documented in some carbonate rocks in California. However, data from historic studies and recent observations have not indicated that asbestos is present in carbonate rocks in El Dorado County except in isolated occurrences where carbonate rocks have undergone contact metamorphism (see "Carbonate Rocks That May Contain Asbestos").

Carbonate Rocks That May Contain Asbestos

The map symbol identifies locations in El Dorado County where previous studies indicate that asbestos is present or may be present in carbonate rocks. These locations are in carbonate rocks that have undergone contact metamorphism. One location (R12E, T9N, Sec. 25) is a historic mine site where a small occurrence of actinolite asbestos was found in the underground workings (Crowley, 1974). At the other location (R8E, T11N, Secs. 25, 26), two small carbonate bodies, each represented by a map symbol, are described by a previous study as containing tremolite with a highly needle-like appearance (Springer, 1971). Whether or not some of this acicular tremolite is actually fibrous (asbestos) cannot be ruled out from the available information in that study.

Additional Technical Information on Carbonate Rocks: The actinolite asbestos present in the historic mine (R12E, T9N, Sec. 25) is reported to be a small occurrence underground, in a skarn zone adjacent to a granitic intrusion. Contact metamorphism of carbonate rocks at the other location (R8E, T11N, Secs. 25, 26) relates to the emplacement of the Pine Hill Intrusive Complex. The two small carbonate bodies at the second location reportedly contain "very acicular tremolite", meaning tremolite that is in the form of needle-like crystals. The terminology "very acicular" may not rule out the possibility that some of this material is actually fibrous (asbestos) in habit (see the discussion in "Additional Technical Information on Altered Gabbro").

Faults and Fault Zones

(Solid where well located, dashed where approximately located or inferred.)

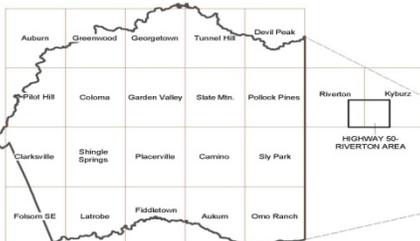
Most serpentinite occurs near faults or within fault zones (areas of highly fractured or crushed rock commonly hundreds of feet wide). Small slivers of serpentinite, too small to map at the scale of this map, may occur in some of these fault zones. These slivers may contain chrysotile or tremolite/actinolite asbestos. Tremolite/actinolite asbestos may also occur in a variety of non-serpentine metamorphic rocks in and near fault zones. Some faults and fault zones shown on the map may have no associated asbestos. Detailed site by site investigations would be needed to determine whether asbestos is present or absent in these areas.

Additional Technical Information on Fault Zones: Most of the faults shown by lines on the map are complexes of smaller faults and shear zones, and are more properly called fault zones. Fault zones in the Sierra Nevada Foothills are seldom less than two hundred feet in width and may be several thousand feet wide or more. The width of a fault zone often varies along its length. Detailed information on the width of fault zones is largely unavailable for western El Dorado County, so fault zone widths are not indicated on the map.

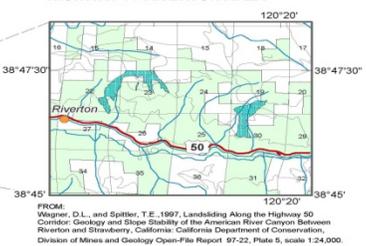
Land Ownership

-  U.S. Forest Service
-  Bureau of Land Management
-  Other Government (Bureau of Reclamation, State Lands Commission, Fish and Game, Parks and Recreation, Bureau of Indian Affairs)

INDEX TO U.S. GEOLOGICAL SURVEY 7.5-MINUTE QUADRANGLES



HIGHWAY 50-RIVERTON AREA



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design -
 North

EA: 03-2F150

Date: May 1, 2012

ASBESTOS MAP LEGEND

03-ED-49-PM 31.0/31.2
Geotechnical Design Report

Plate No.
 3b



Approximate
Location of
Rock Exposure

At easterly of STA "A1" approximately 22+00, looking south.



CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design -
 North

EA: 03-2F150

Date: May 1, 2012

Photograph

03-ED-49-PM 31.0/31.2
Geotechnical Design Report

Plate No.
 4



Wet Soil and
Ponding Water

At about 30 feet east of STA "A1" approximately 18+20, looking south west.



CALTRANS
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design -
North

EA: 03-2F150

Date: May 1, 2012

Photograph

03-ED-49-PM 31.0/31.2
Geotechnical Design Report

Plate No.
5



At about 30 feet east of STA "A1" approximately 17+00, looking south.



CALTRANS
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design -
North

EA: 03-2F150

Date: May 1, 2012

Photograph

**03-ED-49-PM 31.0/31.2
Geotechnical Design Report**

Plate No.
6