

INFORMATION HANDOUT

For Contract No. 04-1J3204

At 04-Sonoma-116-13.7

Identified by

Project ID 0414000190

The United States Department of the Interior, Fish and Wildlife Service Biological Opinion, United States Department of the Interior, Fish and Wildlife Service Biological Opinion Amendment, and Mitigation Monitoring Plan for Soldier Pile Wall Project in the Information Handout refer to contract number 04-1G4204. The requirements in biological opinions and mitigation monitoring plan are valid for contract number 04-1J3204.

BIOLOGICAL OPINIONS

United States Department of the Interior, Fish and Wildlife Service dated 02/21/2012

Service File #81420-2011-F-590-3 (previous Caltrans EA 04-1G420)

United States Department of the Interior, Fish and Wildlife Service Amendment dated 04/22/2013

Service File #81420-2011-F-590-R001-1 (previous Caltrans EA 04-1G420)

United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service dated 12/21/2011

2011/03897

PERMITS

Department of the Army, San Francisco District, United States Army Corps of Engineers dated 04/18/2013

File Number: SPN-2013-0019N

WATER QUALITY

North Coast Regional Water Quality Control Board dated 05/21/2013

WDID No. 1B13011WNSO

Mitigation Monitoring Plan for Soldier Pile Wall Project dated 04/16/2013 (previous Caltrans EA 04-1G420)

AGREEMENTS

California Department of Fish and Wildlife dated 07/14/2014

Notification No. 1600-2014-0044-R3

MATERIALS INFORMATION

Final Hydraulic Report dated 06/28/2012

Foundation Report for Soldier Pile Wall dated 05/30/2014

Water Source Information

Absorb 350 Temporary Crash Cushion manufacturer plan sheet

Quadguard C. Z. System manufacturer plan sheet

ACZ-350 System, TL-2 manufacturer plan sheet

MATERIALS INFORMATION continued

ADIEM-350 manufacturer plan sheet

Smart Cushion Innovations Attenuator Brochure

Smart Cushion Innovations Level II System Complete Concrete Block Transition, 24 Inch, manufacturer plan sheet



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2011-F-0590-3

FEB 21 2012

Ms. Mary Oliva
Attn: Rachel Kleinfelter
Northern San Joaquin Valley
Environmental Management Branch
California Department Transportation
1976 East Dr. Martin Luther King Jr. Blvd
Stockton, California 95205

Subject: Biological Opinion for the Proposed State Route 116 Pocket Canyon Creek
Retaining Wall Replacement Project, Sonoma County, California (Caltrans EA
04-1G420)

Dear Ms. Oliva:

This is in response to your July 8, 2011, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed State Route (SR) 116 Pocket Canyon Creek Retaining Wall Replacement Project, in Sonoma County, California. Your request was received in our office on July 12, 2011, and included a request for formal consultation on the endangered California freshwater shrimp (*Syncaris pacifica*) and the threatened California red-legged frog (*Rana draytonii*). In a November 7, 2011, letter, the California Department of Transportation (Caltrans) concluded that the proposed project may affect, but was unlikely to adversely affect the threatened marbled murrelet (*Brachyramphus marmoratus*) and the threatened northern spotted owl (*Strix occidentalis caurina*). The Service provided Caltrans with the requested draft biological opinion on December 21, 2011. This document represents the Service's biological opinion on the effects of the proposed action on the California red-legged frog. This document has been prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

Following additional review, Caltrans and the Service agreed that the proposed project was not likely to adversely affect the California freshwater shrimp. The action area does not appear to provide habitat for this listed invertebrate and the implementation of a Water Pollution Control Plan (WPCP), Storm Water Pollution Prevention Plan (SWPPP), and erosion control Best Management Practices (BMPs) will likely avoid or minimize degradation of potential downstream habitat. Based on available information, the Service concurs with Caltrans'

determinations that the proposed project is not likely to adversely affect the marbled murrelet and the northern spotted owl. The project will not involve the removal of large trees with structure needed for potential murrelet or spotted owl nest site establishment. Project construction will be restricted between July 10 and October 31, which should be effective in avoiding effects to potential spotted owl nesting sites in the general vicinity.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users legislation (23 U.S.C. 327) allows the Secretary of the U.S. Department of Transportation acting through the Federal Highway Administration (FHWA) to establish a Surface Transportation Project Delivery Pilot Program, whereby a State may assume the FHWA responsibilities under the National Environmental Policy Act (NEPA) for environmental review, agency consultation and other actions pertaining to the review or approval of a specific project. Caltrans assumed these responsibilities for the FHWA on July 1, 2007, through a Memorandum of Understanding within the State of California (http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf) and are exercising this authority as the Federal nexus for section 7 consultation on this project.

This biological opinion is based on: (1) the July 2011, Biological Assessment (BA); (2) a June 20, 2011 field trip; (3) information provided on the California freshwater shrimp from Bill Cox on August 30, 2011; (4) additional information provided by Caltrans in the November 7, 2011, response to our August 11, 2011, 30-Day Letter; (5) Caltrans' edits to the December 21, 2011, draft Biological Opinion; and (6) other information available to the Service.

Consultation History

- | | |
|-----------------|--|
| May 25, 2011 | The Service received a request for technical assistance on the proposed project via an electronic mail (e-mail) message. |
| June 20, 2011 | The Service visited the proposed project site with Caltrans and the National Marine Fisheries Service (NMFS). The Service observed, but was unable to identify a medium-sized ranid frog in Pocket Canyon Creek. The Service advised Caltrans to include northern spotted owl and marbled murrelet in their analysis and recommended seeking the input of California freshwater shrimp biologist to assess the potential for the invertebrate to occur within the action area. |
| June 21, 2011 | Caltrans provided the Service with notes regarding the June 20, 2011, field visit. |
| July 12, 2011 | The Service received the BA requesting formal consultation on the California red-legged frog and the California freshwater shrimp. |
| August 11, 2011 | The Service issued a 30-Day Letter (Service File #81420-2011-F-0590-1) with comments regarding the July 2011 BA along with requests for additional project information. |

- August 30, 2011 The Service received an e-mail message from retired California Department of Fish and Game biologist, Bill Cox, regarding his California freshwater shrimp habitat assessment for the construction footprint. Mr. Cox visited the site under suggestion of Joel Casagrande of NMFS. According to Mr. Cox, the portion of Pocket Canyon Creek within the proposed construction footprint was unlikely to provide habitat for the California freshwater shrimp.
- November 7, 2011 The Service received Caltrans' response to the August 11, 2011, 30-Day Letter. The response included additional project information needed to complete the biological opinion.
- December 21, 2011 The Service issued a draft biological opinion (Service File #81420-2011-F-0590-2) to Caltrans.
- January 12, 2012 The Service received Caltrans' requested edits to the December 21, 2011 draft Biological Opinion along with a request that a final biological opinion be issued with the edits. Caltrans' edits were limited to construction specifications and did not necessitate changes to the effects analysis.

BIOLOGICAL OPINION

Description of the Proposed Action

The following project description was provided by Caltrans with minor modifications for reasons of clarity and accuracy provided by the Service.

General Scope of Work

Caltrans proposes to repair damage to a culvert headwall/retaining wall along SR 116 caused by a 2010 washout by Pocket Canyon Creek. The washout caused the existing 50-foot long culvert headwall/retaining wall along the eastbound direction of SR 116 to fail. Caltrans has already completed temporary slide repair at the site and now proposes to remove and replace the existing wall in order to permanently stabilize the area. The foundation of the existing damaged wall is located within the wetted creek bed and is now unstable and leaning inward towards the creek. The retaining wall also acts as a headwall for an existing culvert that drains local runoff perpendicular into Pocket Canyon Creek. The outlet of the culvert is now disjoined from the wall and empties behind it.

Construction Schedule

Construction of the proposed project is expected to begin in July 2014 and end in October 2014. Construction within Pocket Canyon Creek is expected to be completed within 60 days. Night work will be avoided.

Equipment

It is anticipated that one or more excavators, dozers, cranes or boom trucks, pavers, rollers, and semi trucks will be used to complete the project.

Proposed Project

The proposed project is located on SR 116 east of the town of Guerneville at Post Mile 13.76. This segment of SR 116 is a narrow, winding, low speed, two-lane conventional highway. Within the action area the highway has a 10-foot westbound lane with a 1 to 3-foot paved shoulder and a 9-foot eastbound lane with a 1 to 2-foot paved shoulder.

The proposed project includes installation of a 130-foot long soldier pile retaining wall along the eastbound road shoulder to stabilize the slope between the roadway and Pocket Canyon Creek. The existing retaining wall is well within the existing stream bed, whereas the new wall will be located approximately 8 feet north of the existing wall, widening the active stream channel. The soldier pile wall will be approximately 15 feet tall. To avoid further scouring, the wall will be treated with a stone or concrete finish. The lagging will be buried 10 feet below grade; this would require a 20 to 30-foot linear excavation along the northern edge of the creek bed. A cast-in-drilled-hole pile foundation, approximately 40 feet deep, will be used for the retaining wall.

Rock Slope Protection (RSP) will be placed at the base of the new soldier pile wall to stabilize and further armor the system. Rock will be placed into the creek channel from the roadway. The base of the RSP will be buried below the creek bed grade and it will be keyed or interlocked to ensure stability during high flows. RSP will be planted with vegetation plugs and will not further constrict the width of the creek.

Removal of the existing wall and construction of the new wall will require temporary equipment access into the creek and a water diversion system. Water diversion will include a coffer dam that will be in place for approximately 54 days. Installation of the diversion system will include clearing and grubbing within the creek, installation of the up/down stream dam, and installation of the diversion culvert pipe.

To install the diversion system, an excavator will be necessary for clearing and grubbing. An access ramp will be constructed to enter the creek at the west end of the soldier pile wall. Clearing and grubbing of riparian vegetation with an excavator will be needed to establish access. No vegetation will be removed within the creek bed. No excavation will be done for the diversion system. Gravel-filled bags and a 36-inch high density pipe will be placed in the bed of the creek using a coffer dam (upstream) and a downstream berm to divert water. The diversion system will be approximately 175 feet long.

The failed retaining wall will be removed prior to construction of the new soldier pile wall. Construction of the new wall is expected to take approximately 50 days and will likely involve an excavator, drilling equipment such as a crane with auger, and a bobcat loader. Temporary ramps will be established down the bank into the creek for the necessary excavation of the

existing wall footing and construction of the new wall footing. The remaining wall work will be conducted from the roadway.

An existing 36-inch diameter culvert running perpendicular to and under the highway will be replaced in-kind and the new retaining wall will serve as a headwall for the downstream end of the pipe. The new culvert will be shorter than the existing pipe given that the headwall is being moved approximately 8 feet north of the existing wall. The culvert will empty onto the RSP, dissipating the flow and reducing the erosion potential.

SR 116 will be widened to provide a standard 12-foot wide lane with a 4-foot wide shoulder in the eastbound direction. A portion of the shoulder would extend over the retaining wall on a cantilevered slab. The edge of the eastbound lane will be defined by a concrete barrier that will serve as a guard rail to prevent vehicles from running off the road into Pocket Canyon Creek.

Construction of the project will require one-lane one-way reversible traffic control with a temporary traffic signal. Construction equipment will be parked on the roadway behind the temporary K-rails while reversible traffic control is in process. A flat area on the northwest side of SR 116/private driveway will be used for stockpiling and construction staging.

Site Clean-Up and Restoration

All construction-related materials will be removed after construction activities have been completed. To the maximum extent practicable, temporarily disturbed areas and abandoned roadway will be revegetated with appropriate native species, after each construction phase. Permanent erosion control, including soil stabilization measures such as hydroseeding, coir netting and non-filament mesh will be applied to minimize erosion.

The revegetation plan will likely include, but will not be limited to: soil amendment; planting native vegetation; monitoring and maintaining restoration plan; and trash and debris removal. Irrigation may include hand or truck watering and a temporary above or below grade irrigation system.

Maintenance of the site is expected to be minimal, as the native plants should be well established by the completion of the three year plant establishment period.

Proposed Conservation Measures

Caltrans proposes to avoid and minimize effects to the California red-legged frog by implementing the following measures:

1. Qualifications of proposed biological monitor(s) will be submitted to the Service for approval at least 30 calendar days prior to initiating construction activities.
2. The Service-approved biologist(s) will have the authority to stop any work, through communication with the Caltrans Resident Engineer or their designee that may result in take of a listed species. If the biologist(s) exercises this authority, the Service will be

notified by telephone within one working day. The Service contact will be the Coast-Bay/Forest Foothills Division Chief in the Sacramento Fish and Wildlife Office at (916) 414-6600.

3. Environmentally Sensitive Area (ESA) fencing will be installed at the outer edge of the work area prior to any ground disturbance or other construction-related activities to protect listed-species habitat. Any encroachment beyond the ESA fencing during construction will be prohibited. The ESA fencing will be clearly delineated onto the final contract plans. The project's special provision package will provide clear language regarding acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within sensitive areas.
4. The Service-approved biologist(s) will perform a clearance survey immediately prior to the initial ground disturbance. Safety permitting, the biologist(s) will investigate areas of disturbed soil for signs of listed-species immediately following the initial disturbance of that given area.
5. Construction activities will be limited to the period between July 10 and October 31.
6. Nighttime construction will be minimized to the extent practicable.
7. Erosion control measures will be utilized throughout project construction to prevent/limit silt-laden runoff from entering Pocket Canyon Creek.
8. Vegetation clearing and construction operations will be limited to the minimum necessary in areas of temporary access, work areas, and staging. Trees, snags, shrubs, other vegetation, woody debris, and uncompacted forest litter will be protected to the extent practicable. Tree and shrub trimming and removal will be minimized to the extent possible. When feasible, trees and shrubs will be trimmed above ground and roots will be left intact. All vegetation trimmings will either be hauled off-site and disposed of properly, or chipped and left on-site as determined by the Caltrans Resident Engineer.
9. A WPCP and erosion control BMPs will be implemented to minimize erosion.
10. Construction crews will review the dewatering plan prior to any in-stream work within the bed and banks of Pocket Canyon Creek that requires the construction of coffer dams and/or dewatering.
11. Caltrans will comply with Federal Executive Order 13112 to reduce the spread of invasive non-native plant species and minimize the potential decrease of palatable vegetation for wildlife species. In the event that high- or medium-priority noxious weeds are disturbed or removed during construction or construction-related activities, the

contractor will contain the plant material associated with these noxious weeds, and dispose of it in a manner that will not promote the spread of the species.

12. All imported fill material will be certified to be non-toxic and weed free.
13. All food and food-related trash items will be enclosed in sealed trash containers and removed completely from the site at the end of each day.
14. No firearms will be allowed in the work site except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.
15. No pets will be permitted in the work site.
16. A Revegetation Plan will be prepared for restoration of temporary work areas.
17. Caltrans will provide a Revegetation Plan to be reviewed and approved by the Service no later than 60 calendar days prior to groundbreaking.
18. A Spill Response Plan will be prepared and implemented.
19. Vehicle and equipment refueling and lubrication will only be permitted in designated disturbed or developed areas where accidental spills can be immediately contained.
20. All major servicing and cleaning of the equipment will be performed prior to arrival on-site.
21. Caltrans will report to the Service any information about take or suspected take of listed-species not authorized by this biological opinion. Caltrans will notify the Service via an e-mail or telephone message within 24 hours of receiving such information. Notification will include the date, time, location of the incident or the finding of a dead or injured animal, and photographs of the specific animal. The individual animal will be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. Caltrans will use the Coast-Bay/Forest Foothills Division Chief in the Sacramento Fish and Wildlife Office at (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660 as contacts in these situations.
22. No excavation of the creek bed will be done for installation of the temporary coffer dam. All materials used to construct the temporary coffer dam will be removed from the creek bed once work on the retaining wall is complete.
23. A SWPPP will be implemented to ensure the proper installation and maintenance of sediment control measures.

24. All construction personnel will attend a mandatory Worker Environmental Awareness Training Program delivered by a Service-approved biologist(s) prior to working on the project site. The program will include an explanation of Federal laws protecting the California red-legged frog as well as its natural history and identification. An outline of the program will be submitted to the Coast-Bay/Forest Foothills Division Chief in the Sacramento Fish and Wildlife Office within 20 working days prior to the initial onset of construction activities. Documentation of the training, including sign-in sheets, will be kept on file and available on request.
25. The Service-approved biological(s) will be on-site during any ground disturbing activities that have the potential to adversely affect the California red-legged frog.
26. No more than 30 calendar days prior to any ground disturbance, pre-construction surveys will be conducted by the Service-approved biologist(s) for the California red-legged frog. They will consist of walking surveys of the project limits and accessible adjacent areas within at least 50 feet of the project limits where feasible. The biologist(s) will investigate all potential California red-legged frog cover sites. This includes thorough investigation of mammal burrows, rock and soil cracks, root wads, undercut banks, and debris. Native vertebrates found in the cover sites will be documented and relocated to adequate cover sites outside of the work area. The entrances and other refuge features within the project limits will be collapsed or removed following investigation and clearance.
27. If a California red-legged frog, or any frog that the Service-approved biologist(s) or construction personnel believe may be the species, is encountered during construction, or if any contractor, employee, or agency personnel inadvertently kills or injures a California red-legged frog, the following protocol will be followed:
 - a. All work that could result in direct injury, disturbance, or harassment of the animal will immediately cease.
 - b. The Caltrans Resident Engineer will be immediately notified.
 - c. Based on the professional judgement of the Service-approved biologist (s), if project activities can be conducted without harming or injuring the frog, the frog will be left at the location of discovery and monitored by the biologist. If possible, California red-legged frogs will not be handled and will be allowed to exit the work area on their own. The frog will be captured and relocated using Service guidelines if safe avoidance is not possible. All project personnel will be notified of the finding, and at no time will work occur within the vicinity of the individual(s) without the Service-approved biologist(s) present. The biologist will advise the Caltrans Resident Engineer or their designee on how to proceed.

- d. The Service-approved biologist(s) will contact the Service within 24 hours to report the incident.
28. To prevent inadvertent entrapment of California red-legged frogs during construction, steep-walled holes or trenches more than 1-foot deep will be covered at the close of each day by plywood or similar materials. Alternatively, an additional 4-foot high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of frogs. If it is not feasible to cover an excavation or provide an additional 4-foot high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. The Service will be notified of the incident by telephone and e-mail within one working day to report the incident.
29. If pumping is used for dewatering, intakes will be completely screened with wire mesh no larger than 0.2 inch to prevent frogs from entering the pumps.
30. Plastic monofilament netting (erosion control matting) or similar material will not be used in the work site because California red-legged frogs can become entangled and trapped in it. Instead, Caltrans will use alternative materials such as coconut coir matting or pacified hydroseeding compounds.
31. All construction pipes, culverts, or similar structures, construction equipment or construction debris left overnight within the action area will be inspected for California red-legged frogs by the Service-approved biologist prior to the beginning of each day's activities and prior to being moved.
32. Injured California red-legged frogs will be cared for by a licensed veterinarian or other qualified person such as the on-site biologist(s); dead individuals will be placed in a sealed plastic bag with the date, time, location of discovery, and the name of the person who found the animal; the carcass will be kept in a freezer; and held in a secure location. The Service will be notified within one working day of the discovery of death or injury to a California red-legged frog that occurs due to project related activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quad and other maps at a finer scale, as requested by the Service, and any other pertinent information. Caltrans will use the Coast-Bay/Forest Foothills Division Chief in the Sacramento Fish and Wildlife Office at (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660 as contacts in these situations. Sightings of any listed or sensitive animal species will be reported to the California Natural Diversity Database (CNDDDB) of the California Department of Fish and Game.

Analytical Framework for the Jeopardy Determination

The following analysis relies on four components to support the jeopardy determination for the California red-legged frog: (1) the *Status of the Species*, which evaluates the species' range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the *Effects of the Proposed Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with the implementing regulations for section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed Federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the species' current status and, for non-Federal activities in the action area, those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the species and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the action area includes the direct effects associated with the approximately 0.218-acre construction footprint (approximately 0.17 acre of riparian, creekbed, and disturbed road shoulder and 0.048 acre of existing hardscape) and the indirect effects to the California red-legged frog within the Pocket Canyon Creek Watershed due to runoff, noise, vibration, and nighttime lighting.

Status of the Species

Listing Status

The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description

The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution

The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the Central California Coast. Isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFG 2011a).

Status and Natural History

California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, California red-legged frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. California red-legged frogs also can be found in disturbed areas such as channelized creeks and drainage ditches in urban and agricultural areas. For example, an adult California red-legged frog was observed in a shallow isolated pool on North Slough Creek in the American Canyon area of Napa County (CDFG 2011a, 2011b; CNDDDB occurrence number 1062). This frog location was surrounded by vineyard development. Another adult California red-legged frog was observed under debris in an unpaved parking lot in a heavily industrial area of Burlingame (Patrick Kobernus/Coast Ridge Ecology communication with Michelle Havens/Service on October 16, 2008). This Burlingame frog was likely utilizing a nearby drainage ditch. Caltrans also has discovered California red-legged frog adults, tadpoles, and egg masses within a storm drainage system within a major cloverleaf intersection of Millbrae Avenue and SR 101 in a heavily developed area of San Mateo County (Caltrans 2007). California red-legged frog has the potential to persist in disturbed areas as long as those locations provide at least one or more of their life history requirements.

California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows

(Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1 to 2 miles of a breeding site that stays moist and cool through the summer, including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provides cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5-mile, with a few individuals moving up to 1 to 2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al.* (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, i.e., California blackberry, poison oak and coyote brush. Dispersing frogs in northern Santa Cruz County traveled distances from 0.25-mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that a 57 percent majority of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. Her study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2-inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia, including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The

majority of terrestrial movements lasted from 1 to 4 days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, e.g., woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after six to 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand resulted in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3½ to seven months following hatching and reach sexual maturity two to three years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than one percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). California red-legged frogs may live eight to ten years (Jennings *et al.* 1992).

Populations can fluctuate from year to year; favorable conditions allow the species to have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, the animal may temporarily disappear from an area when conditions are stressful (e.g., during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable and changes with the life history stage. The diet of the larvae is not well studied, but is likely similar to that of other ranid frogs, which feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frog, three-spined stickleback and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Metapopulation and Patch Dynamics

The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry predict that individual animals will exit patches at more “permeable” areas that facilitate movement (Buechner 1987; Stamps *et al.* 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a “corridor” must be determined from the perspective of the animal (Forys and Humphrey 1996).

Because their habitats have been fragmented, many endangered and threatened species exist as metapopulations (Verboom and Apeldom 1990; Verboom *et al.* 1991). A metapopulation is a collection of spatially discrete subpopulations that are connected by the dispersal movements of the individuals (Levins 1970; Hanski 1991). For metapopulations of listed species, a prerequisite to recovery is determining if unoccupied habitat patches are vacant due to the attributes of the habitat patch (food, cover, and patch area) or due to patch context (distance of the patch to other patches and distance of the patch to other features). Subpopulations on patches with higher quality food and cover are more likely to persist because they can support more individuals. Large populations have less of a chance of extinction due to stochastic events (Gilpin and Soule 1986). Similarly, small patches will support fewer individuals, increasing the rate of extinction. Patches that are near occupied patches are more likely to be recolonized when local extinction occurs and may benefit from emigration of individuals via the “rescue” effect (Hanski 1982; Gotelli 1991; Holt 1993; Fahrig and Merriam 1985). For the metapopulation to persist, the rate of patches being colonized must exceed the rate of patches going extinct (Levins 1970). If some subpopulations go extinct regardless of patch context, recovery actions should be placed on patch attributes. Patches could be managed to increase the availability of food and/or cover.

Movements and dispersal corridors likely are critical to California red-legged frog population dynamics, particularly because the animals likely currently persist as metapopulations with disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects. The survival of wildlife species in fragmented habitats may ultimately depend on their ability to move among patches to access necessary resources, retain genetic diversity, and maintain reproductive capacity within populations (Hilty and Merenlender 2004; Petit *et al.* 1995; Buza *et al.* 2000).

Most metapopulation or meta-population-like models of patchy populations do not directly include the effects of dispersal mortality on population dynamics (Hanski 1994; With and Crist 1995; Lindenmayer and Possingham 1996). Based on these models, it has become a widely held notion that more vagile species have a higher tolerance to habitat loss and fragmentation than less vagile species. But models that include dispersal mortality predict exactly the opposite: more vagile species should be more vulnerable to habitat loss and fragmentation because they are

more susceptible to dispersal mortality (Fahrig 1998; Casagrandi and Gatto 1999). This prediction is supported by Gibbs (1998), who examined the presence-absence of five amphibian species across a gradient of habitat loss. He found that species with low dispersal rates are better able than more vagile species to persist in landscapes with low habitat cover. Gibbs (1998) postulated that the land between habitats serves as a demographic “drain” for many amphibians. Furthermore, Bonnet *et al.* (1999) found that snake species that frequently make long-distance movements have higher mortality rates than do sedentary species.

Threats

Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora*), and suggested that bullfrogs could prey on subadult California red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction by eating adult male California red-legged frogs. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; Jennings 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks dispersal, and the introduction of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Chytridiomycosis and ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al.* 2003; Lips *et al.* 2006). Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks in northwestern California. Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2006). Humans can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e., contaminated boots, waders or

fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease.

Negative effects to wildlife populations from roads and pavement may extend some distance from the actual road. The phenomenon can result from vehicle-related mortality, habitat degradation, noise and light pollution, and invasive exotic species. Forman and Deblinger (1998) described the area affected as the “road effect” zone. One study along a four-lane road in Massachusetts determined that this zone extended for an average of 980 feet to either side of the road for an average total zone width of approximately 1,970 feet. However, in places they detected an effect greater than 0.6-mile from the road. The road effect zone can also be subtle. Van der Zandt *et al.* (1980) reported that lapwings and black-tailed godwits feeding at 1,575 to 6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep increases near roads (MacArthur *et al.* 1979). Trombulak and Frissell (2000) described another type of “road-zone” effect due to contaminants. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads and elevated levels of metals in soil and plants were detected at 660 feet of roads. The “road-zone” varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the road-zone along primary roads of 1,000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The road-zone with regard to California red-legged frogs has not been adequately investigated.

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California red-legged frog are especially vulnerable to roads and well-used large paved areas in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species. High-volume highways pose a nearly impenetrable barrier to amphibians and result in mortality to individual animals as well as significantly fragmenting habitat. Hels and Buchwald (2001) found that mortality rates for anurans on high traffic roads are higher than on low traffic roads. Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidences of very large numbers of road-killed frogs are well documented (Asley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Most studies regularly count road mortalities from slow moving vehicles (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick *et al.* 1998) or by foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but may be an incorrect assumption for small animals, such as the California red-legged frog. Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are small and slow-moving, and thus are not easily avoided by drivers (Carr and Fahrig 2001).

Environmental Baseline

The general vicinity is primarily characterized by a low density rural community surrounded by pine and redwood forest, riparian corridors, grass fields, and vineyards. The CNDDDB includes little data for the vicinity which is likely in part due to the lack of development-driven biological survey effort (CDFG 2011a; 2011b). The CNDDDB include two California red-legged frog records approximately 6 and 7 miles southwest of the action area in Sheephouse Creek (CNDDDB occurrence numbers 1093 and 1092). The CNDDDB includes another California red-legged frog record approximately 4 miles north of the action area in the Austin Creek State Recreation Area (CNDDDB occurrence number 1001).

Due to limited access and survey data, the Service used aerial photography and field observations from available access locations to independently identify available upland habitat for refugia and dispersal as well as potential riparian and aquatic habitat throughout the action area vicinity. Pocket Canyon Creek is a perennial stream with a confluence with the Russian River in Guerneville. Within the action area, the creek is narrow and is surrounded by dense riparian vegetation. The creek likely provides year-round refugia and foraging habitat for adult and juvenile red-legged frogs. A ranid frog was briefly observed leaping into the creek during the June 20, 2011, site visit but it was unclear if the frog was a California red-legged frog, foothill yellow-legged frog, or a bullfrog.

Pocket Canyon Creek is likely high and swift following winter and spring rains. It is unknown whether highwater events overflow and produce side pools that would provide viable breeding opportunities for California red-legged frogs along Pocket Canyon Creek or the nearby Russian River. The general area is heavily wooded which makes searching for possible ponds difficult with aerial photos. Given the limitations the Service was able to find four potential breeding ponds within a mile of the proposed project. The four ponds included a stock pond approximately 800 feet northeast, a basin approximately 0.4 miles southeast; a vineyard basin 0.5 miles south, and a catchment pond 0.85 miles east of the proposed project.

Adult California red-legged frogs are highly mobile and have been documented to move more than 2 miles over upland habitat. The frog habitat within the action area has direct connectivity with suitable habitat up and downstream of the project site and is well within the feasible movement distance to potential breeding locations.

The Service believes that the California red-legged frog is reasonably certain to occur within the action area due to: (1) the project being located within the species' range and current distribution; (2) suitable aquatic and upland habitat for foraging and cover are located within the action area; (3) the action area has connectivity with confirmed and potential breeding ponds; (4) all the elements needed to support the species' life history are located within 0.5-mile of the action area; and (5) the biology and ecology of the animal.

Effects of the Proposed Action

Caltrans proposes to minimize construction related effects by implementing the *Conservation Measures* included in the project description section of this biological opinion. Effective implementation of *Conservation Measures* will likely minimize effects to the California red-legged frog during construction, but incidental take is still likely to occur. Therefore, the proposed SR 116 Pocket Canyon Creek Retaining Wall Replacement Project has the potential to result in a variety of adverse effects that would result in take of the California red-legged frog.

Construction activities could result in the killing, harming and/or harassment of juvenile and adult frogs in the action area. Caltrans determined that the effects to habitat would be limited to approximately 0.17 acres of California red-legged frog habitat but frogs could be encountered throughout the 0.218-acre construction footprint.

The California red-legged frog is most likely to be affected during the construction phase of the project. Injury, exposure, disorientation, and disruption of normal behaviors will likely result from the removal and/or disturbance of vegetation and cover sites within the project footprint, the establishment and use of temporary access down to the streambed, dewatering of the creek, exclusion from the habitat within the work area, and disruption of connectivity between up and downstream habitat. Construction noise, vibration, lighting used for night work, and increased human activity during the construction phase may interfere with normal behaviors such as feeding, sheltering, movement between refugia and foraging grounds, and other frog essential behaviors. This can result in avoidance of areas that have suitable habitat but intolerable levels of disturbance.

Unless identified by the biological monitor or site personnel, and rescued by the biological monitor, individual California red-legged frogs exposed during earthwork likely will be crushed and killed or injured by construction-related activities. Even with biological monitoring, overall awareness, and proper escape ramps, California red-legged frogs could fall into the trenches, pits, or other excavations, and then risk being directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. Proper trash disposal is often difficult to enforce on a large construction site and is a common non-compliance issue (personal observation, John Cleckler/Service). Improperly disposed edible trash could attract predators, such as raccoons, crows, and ravens, to the sites, which could subsequently prey on California red-legged frogs. Caltrans commitment to use erosion control devices other than mono-filament should be effective in avoiding the associated risk of entrapment that can result in death by predation, starvation, or desiccation (Stuart *et al.* 2001). Limiting work within Pocket Canyon Creek between July 10 and October 31, primarily avoids the wettest time of year and the onset of the breeding season when frogs are more likely to be involved in dispersal. Caltrans will further minimize adverse effects by locating construction staging, storage, and parking areas outside of sensitive habitat, clearly marking construction work boundaries with high-visibility fencing, conducting preconstruction surveys and environmental monitoring, and revegetating temporarily disturbed areas. The amount of take resulting from construction activities and the removal of

habitat will be partially minimized by educating workers, and requiring a Service-approved biologist to be present to monitor construction activities.

If unrestricted, the proposed construction activities could result in the introduction of chemical contaminants to frog habitat. Exposure pathways could include inhalation, dermal contact, direct ingestion, or secondary ingestion of contaminated soil, plants or prey species. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. However, Caltrans proposes to minimize these risks by implementing a WPCP, SWPPP, and erosion control BMPs, which will consist of installing coir rolls, straw wattles and/or silt fencing to capture sediment and prevent runoff or other harmful chemicals from entering the aquatic habitat; and locating staging, storage and parking areas away from aquatic habitat.

Preconstruction surveys and the relocation of individual California red-legged frogs may avoid injury or mortality; however, capturing and handling frogs may result in stress and/or inadvertent injury during handling, containment, and transport. Caltrans proposes to minimize these effects by using Service-approved biologists, limiting the duration of handling, and relocating amphibians to suitable nearby habitat within the Pocket Canyon Creek riparian corridor in accordance with Service guidance.

If unrestricted, biologists and construction workers traveling to the action area from other project sites may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytridiomycosis, caused by chytrid fungus, may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (water pH) that reduce normal immune response capabilities (Bosch *et al.* 2001, Weldon *et al.* 2004). Caltrans will minimize these risks by implementing proper decontamination procedures prior to and following aquatic surveys and handling amphibians. These will minimize the risk of transferring diseases through contaminated equipment or clothing. Proper handling and relocation of frogs out of construction areas increases the likelihood of their survival.

The completed project will not increase the travel speed or capacity on SR 116 and therefore is unlikely to increase the local risk of California red-legged frog mortality from vehicle collision. The retaining wall and overhanging concrete slab is likely to deter frogs from exiting the riparian corridor and entering the action area section of the roadway.

Caltrans proposed restoration of areas that will be temporarily disturbed to provide access into Pocket Canyon Creek. Caltrans did not propose a mechanism, species composition, success criteria, or monitoring plan but committed to providing a plan for Service-review at least 60 days prior to ground disturbance. Prompt and appropriate habitat restoration and revegetation is an important measure in minimizing the effects of the project on the California red-legged frog. Effective restoration will provide erosion control to minimize sedimentation of Pocket Canyon Creek and replace vegetation that provides cover for frogs and potential attraction for their prey.

The existing damaged retaining wall is anchored directly in the Pocket Canyon Creek bed eliminating that northern 50-foot section of stream bank habitat. The proposed wall is likely to improve this situation by widening the potential channel width along with the placement of vegetated RSP between the creek bed and wall interface. Placement of RSP is not typically considered a habitat enhancement measure but it is likely to be an improvement to the baseline condition. RSP will stabilize the creek; provide cover and basking sites for frogs and their prey; and the riparian vegetation planted within the RSP will provide cover to a previously denuded area.

Cumulative Effects within the Action Area

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The Service is not aware of any cumulative effects to the California red-legged frog that are reasonably certain to occur within the action area.

Conclusion

After reviewing the current status, the environmental baseline for the action area; the effects of the proposed project, and the cumulative effects of the proposed SR 116 Pocket Canyon Creek Retaining Wall Replacement Project it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by Caltrans so that they become binding conditions of any grant or permit issued to Caltrans as appropriate, in

order for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this Incidental Take Statement. If Caltrans (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect due to their wariness, cryptic nature, and the abundance of potential cover sites within the action area. Finding an injured or dead California red-legged frog is unlikely due to their relatively small body size, rapid carcass deterioration, and likelihood that the remains will be removed by a scavenger. Depending on the condition of a frog carcass, it may be difficult to differentiate between the remains of a California red-legged frog and a foothill yellow-legged frog. Losses of the California red-legged frog may also be difficult to quantify due to a lack of baseline survey data and seasonal and annual fluctuations in their numbers due to environmental or human-caused disturbances. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent and temporary loss and degradation of suitable habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as: (1) the injury and mortality of no more than one California red-legged frog; and (2) the capture, harm and harassment of all California red-legged frogs within the 0.218-acre action area. Upon implementation of the following *Reasonable and Prudent Measures*, California red-legged frogs within the action area in proportion to the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are exempted.

This biological opinion does not authorize take for non-Federal actions associated with use, operation, and maintenance of SR 116. Routine Caltrans' maintenance activities such as the removal and displacement of sand, silt, sediment, debris, rubbish, vegetation, and other obstruction flow; the control of weeds, grasses and emergent vegetation, minor repair of existing facilities, rip rap replacement, and culvert replacement have the potential to result in take of the California red-legged frog.

Effect of the Take

The Service has determined that this level of anticipated take for the California red-legged frog is not likely to jeopardize the continued existence of the species.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the California red-legged frog. Caltrans will be responsible for the implementation and compliance with these measures:

1. Caltrans shall implement actions to minimize adverse effects to the California red-legged frog.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure one (1):
 - a. Caltrans shall minimize the potential for harm, harassment, or killing of the California red-legged frog resulting from project related activities by implementing the conservation measures as described in the *Description of the Proposed Action* of this biological opinion.
 - b. Caltrans shall require all contractors to comply with the Act in the performance of the action and shall perform the action as outlined in the *Description of the Proposed Action* of this biological opinion as provided by Caltrans in the July 2011, BA and all other supporting documentation submitted to the Service.
 - c. Caltrans shall include language in their contracts that expressly requires contractors and subcontractors to work within the boundaries of the project footprints identified in this biological opinion, including vehicle parking, staging, laydown areas, and access roads.

The Resident Engineer or their designee shall be responsible for implementing the conservation measures and Terms and Conditions of this biological opinion and shall be the point of contact for the project. The Resident Engineer or their designee shall maintain a copy of this biological opinion onsite whenever construction is taking place. Their name and telephone number shall be provided to the Service at least 30 calendar days prior to groundbreaking at the project. Prior to ground breaking, the Resident Engineer must submit a letter to the Service verifying that they possess a copy of this biological opinion and have read and understand the Terms and Conditions.

- d. Each California red-legged frog encounter shall be treated on a case-by-case basis in coordination with the Service; general guidance is as follows: (1) leave the non-injured frog if it is not in danger or (2) move the frog to a nearby location if it is in danger. These two options are further described as follows.
 - 1) When a California red-legged frog is encountered in the action area the first priority is to stop all activities in the surrounding area that have the potential

to result in the harm, harassment, injury, or death of the individual. Then the monitor needs to assess the situation in order to select a course of action that will minimize adverse effects to the individual. Contact the Service once the site is secure. The contacts for this situation are Ryan Olah (ryan_olah@fws.gov) or John Cleckler (john_cleckler@fws.gov). They can be reached at (916) 414-6600. If you get voicemail message for these contacts then contact John Cleckler on his cell phone at (916) 712-6784.

The first priority is to avoid contact with the frog and allow it to move out of the action area and hazardous situation on its own to a safe location. The animal shall not be picked up and moved because it is not moving fast enough or it is inconvenient for the construction schedule. This guidance only applies to situations where a California red-legged frog is encountered on the move during conditions that make their upland travel feasible. This does not apply to California red-legged frogs that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to provide escape cover and safe access to breeding, feeding, and sheltering habitat should they move outside the construction footprint.

Avoidance is the preferred option if a frog is not moving and is using aquatic habitat or if the frog is within some sort of burrow or other refugia. The area shall be well-marked for avoidance by construction and a Service-approved biological monitor shall be assigned to the area when work is taking place nearby.

- 2) The animal shall be captured and moved when it is the only option to prevent its death or injury.

If appropriate habitat is located immediately adjacent to the capture location then the preferred option is short distance relocation to that habitat. This must be coordinated with the Service but the general guidance is the frog shall not be moved outside of the area it would have traveled on its own. Under no circumstances should a California red-legged frog be relocated to another property without the owner's written permission. It is Caltrans' responsibility to arrange for that permission.

The release must be coordinated with the Service and will depend on where the individual was found and the opportunities for nearby release. In most situations the release location is likely to be into the mouth of a small burrow or other suitable refugia and in certain circumstances pools without non-native predators may be suitable for frogs.

Only Service-approved biologists for the project can capture California red-legged frogs. Nets or bare hands may be used to capture California red-legged

frogs. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within two hours before and during periods when they are capturing and relocating California red-legged frogs. To avoid transferring disease or pathogens between sites during the course of surveys or handling of the frogs, Service-approved biologists must use the following guidance for disinfecting equipment and clothing. These recommendations are adapted from the *Declining Amphibian Population Task Force's Code* which can be found in their entirety at: <http://www.open.ac.uk/daptf/>.

- i. All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, shall be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water and/or an amphibian. Cleaned items shall be rinsed with clean water before leaving each site.
 - ii. Boots, nets, traps, and other equipment, shall then be scrubbed with either a 70 percent ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT 128 (quaternary ammonium, use 1:60 dilution), or a 6 percent sodium hypochlorite 3 solution and rinsed clean with water between sites. Avoid cleaning equipment in the immediate vicinity of a pond or wetland. All traces of the disinfectant shall be removed before entering the next aquatic habitat.
 - iii. Used cleaning materials (liquids, etc.) shall be disposed of safely, and if necessary, taken back to the lab for proper disposal.
 - iv. Service-approved biologists shall limit the duration of handling and captivity. While in captivity, individual California red-legged frogs shall be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for holding or transporting shall not contain any standing water.
- e. Caltrans' Revegetation Plan is not limited to but shall include: (1) schedule; (2) methodology; (3) a list of the seed mixes and container plants; (4) plant material source; (5) irrigation; (6) maintenance schedule; (7) monitoring program; (8) success criteria; (9) non-native control; and (10) remediation and adaptive management. In addition, annual monitoring reports on the success of the plantings shall be provided to the Service for at least the first four years following project completion.
 - f. If pumping is used for dewatering, intakes shall be completely screened with wire mesh no larger than 0.2 inches to prevent frogs from entering the pump.
 - g. The Service-approved biologist(s) shall permanently remove, from the project site, any exotic wildlife species, such as bullfrogs and crayfish, to the extent possible.

Reporting Requirements

Caltrans shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within 60 calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frog, if any; (v) occurrences of incidental take to listed species, if any; and (vi) other pertinent information.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

The Service requests notification of the implementation of any conservation recommendations in order to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats. We propose the following conservation recommendations:

1. Enhancing habitat connectivity and wildlife passage across roads as well as reducing road effects should be included in the *Purpose and Needs* section of environmental documents. FHWA agreed to coordinate with the Service on wildlife movement issues in a June 2, 2010, letter addressed to Mr. Greg Costello of the Western Environmental Law Center. As their NEPA delegate, Caltrans should adopt the commitments made by FHWA to consider wildlife movement in transportation planning and project development.
2. Caltrans should include a wildlife passage section in their biological assessments that includes an analysis of the existing passage and how the project will affect passage. The analysis should include identification of the species' resources on both sides of the project boundaries, an appropriately timed road mortality survey to identify "hot spots," and strategic locations where the species could benefit from the enhancement of an existing crossing or the installation of a new crossing. Caltrans should coordinate with their headquarters office and the University of California at Davis Road Ecology Center to develop a passage and road effects approach. Further guidance is provided by FHWA's *Wildlife Vehicle Collision Reduction Study* available at: <http://www.fhwa.dot.gov/environment/hconnect/wvc/index.htm> (FHWA 2008).
3. Roadways can constitute a major impediment or barrier to wildlife movement. Therefore, Caltrans should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage for the California red-legged frog. Include photographs, plans, and other information in BAs if "wildlife friendly" crossings are incorporated into projects.

Efforts should be made to establish upland culverts designed specifically for wildlife movement. Transportation agencies should also acknowledge the value of enhancing human safety by providing safe passage for wildlife in their early project design.

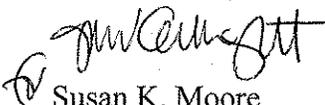
4. Caltrans should reference information from the internal system they have developed to keep track of road mortality records and the University of California at Davis, Road Ecology Center's California Roadkill Observation System (<http://www.wildlifecrossing.net/california/>) in their BAs.
5. Following through with the December 21, 2010, Memorandum of Understanding agreement regarding advanced mitigation, Caltrans should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California red-legged frog and other listed species. Such banking systems have potential to be used for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate. Efforts should be made to preserve habitat along roadways in association with wildlife crossings.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the proposed SR 116 Pocket Canyon Creek Retaining Wall Replacement Project in Sonoma County, California. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, including work outside of the project footprint analyzed in this opinion and including vehicle parking, staging, lay down areas, and access roads; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion including use of rodenticides or herbicides; relocation of utilities; and use of vehicle parking, staging, lay down areas, and access roads; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any additional take will not be exempt from the prohibitions of section 9 until consultation has been completed on a reinitiation.

If you have questions concerning this opinion on the proposed SR 116 Pocket Canyon Creek Retaining Wall Replacement Project, please contact John Cleckler or Ryan Olah at the letterhead address or at (916) 414-6600.

Sincerely,


Susan K. Moore
Field Supervisor

Ms. Mary Oliva

27

cc:

Scott Wilson and Adam McKannay, California Department of Fish and Game, Yountville,
California

Joel Casagrande, National Marine Fisheries Service, Santa Rosa, California

Rachel Kleinfelter, California Department of Transportation, Stockton, California

Literature Cited

- Barry, S. 1992. Letter to Marvin L. Plenert, Regional Director, U.S. Fish and Wildlife Service, Portland, Oregon, regarding proposed listing.
- Bosch, J., I. Martinez-Solano, and M. Garcíaparis. 2001. Evidence of a chytrid fungus infection involved in the decline of the common midwife toad (*Alytes obstetricans*) in protected areas of central Spain. *Biological Conservation* 97: 331–337.
- Buechner, M. 1987. Conservation in insular parks: simulation models of factors affecting the movement of animals across park boundaries. *Biological Conservation* 41:57-76.
- Bulger, J. B., N. J. Scott Jr., and R. B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. *Biological Conservation* 110:85-95.
- Bury, R. B and J. A. Whelan. 1984. Ecology and Management of the Bullfrog. Fish and Wildlife Service/Resource Publication 155.
- Buza, L., A. Young, and P. Thrall. 2000. Genetic erosion, inbreeding and reduced fitness in fragmented populations of the endangered tetraploid pea *Swainsona recta*. *Biological Conservation* 93:177–186.
- California Department of Fish and Game (CDFG). 2011a. California Natural Diversity Data Base (CNDDB) RAREFIND. Natural Heritage Division, Sacramento, California.
- _____. 2011b. BIOSIS. Natural Heritage Division, Sacramento, California.
- California Department of Transportation (Caltrans). 2007. Biological assessment for the restoration of the hydraulic capacity of the Cowan Storm Drain Canal within the U.S. Highway 101/Millbrae Avenue Interchange. EA 3A0400. December 2007. Caltrans District 4, Oakland, California.
- Carr, L. W., and L. Fahrig. 2001. Effect of road traffic on two amphibian species of differing vagility. *Conservation Biology* 15: 1071-1078.
- Casagrandi, R., and M. Gatto. 1999. A mesoscale approach to extinction in fragmented habitats. *Nature* 400: 560-562.
- Cooke, A. S. 1995. Road mortality of common toads (*Bufo bufo*) near a breeding site, 1974-1994. *Amphibia-Reptilia* 16: 87-90.

- Davidson, E. W., M. Parris, J. Collins, J. Longcore, A. P. Pessier, and J. Brunner. 2003. Pathogenicity and transmission of Chytridiomycosis in tiger salamanders (*Ambystoma tigrinum*). *Copeia* 2003(3): 601-607.
- Drews, C. 1995. Road kills of animals by public traffic in Mikumi National Park, Tanzania, with notes on baboon mortality. *African Journal of Ecology* 33: 89-100.
- Emlen, S. T. 1977. "Double clutching" and its possible significance in the bullfrog. *Copeia* 1977(4):749-751.
- Fahrig, L. 1998. When does fragmentation of breeding habitat affect population survival? *Ecological Modeling* 105: 273-292.
- Fahrig, L., and G. Merriam. 1985. Habitat patch connectivity and population survival. *Ecology* 66:1762-1768
- Fellers, G. 2005. *Rana draytonii* Baird and Girard, 1852b California red-legged frog. Pages 552-554 in M. Lannoo (editor). Amphibian declines the conservation status of United States species. University of California Press. Berkeley, California.
- Fisher, R. N., and H. B. Schaffer. 1996. The Decline of Amphibians in California's Great Central Valley. *Conservation Biology* 10(5):1387-1397.
- Forman, R.T. 2000. Estimate of the Area Affected Ecologically by the Road System in the United States. *Conservation Biology* 14(1): 31-35.
- Forman, T. T. and R. D. Deblinger. 1998. The ecological road-effect zone for transportation planning, and a Massachusetts highway example. Pages 78-96 in G. L. Evink, P. Garrett, D. Zeigler, and J. Berry, editors. Proceedings of the international conference on wildlife ecology and transportation. Publication FL-ER-69-98. Florida Department of Transportation, Tallahassee.
- Forys, E. A. and S. R. Humphrey. 1996. Home range and movements of the Lower Keys marsh rabbit in a highly fragmented environment. *Journal of Mammalogy* 77:1042-1048.
- Garner, T.W.J., S. Walker, J. Bosch, A. D. Hyatt, A. A. Cunningham, M. C. Fisher. 2005. Chytrid fungus in Europe. *Emerging Infectious Diseases* 11:1639-1641.
- Gibbs, J. P. 1998. Amphibian movements in response to forest edges, roads, and streambeds in southern New England. *Journal of Wildlife Management* 62: 584-589.
- Gilpin, M. E., and M. E. Soule. 1986. Minimum viable populations: process of species extinctions. Pages 19-34 in M. E. Soule, editor. *Conservation biology: the science of scarcity and diversity*. Sinauer, Sunderland, Massachusetts.

- Gotelli, N. J. 1991. Metapopulation models: the propagule rain, the rescue effect, and the core-satellite hypothesis. *The American Naturalist* 138: 768-776.
- Hansen, L. 1982. Trafikdræbte dyr i Danmark (Road kills in Denmark, in Danish). *Dansk Ornitologisk Forenings Tidsskrift* 76, pp. 97-110.
- Hanski, I. 1982. Dynamics of regional distribution: the core and satellite hypothesis. *Oikos* 38:210-221.
- _____. 1991. Single species metapopulation systematics: concepts, models and observations. *Biological Journal of the Linnean Society* 42:3-16.
- _____. 1994. A practical model of metapopulation dynamics. *Journal of Animal Ecology* 63: 151-162.
- Hayes, M. P., and M. R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylei*): implications for management. Pages 144-158 in R. Sarzo, K. E. Severson, and D. R. Patton (technical coordinators). Proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America. United States Department of Agriculture, Forest Service, Rocky Mountain Range and Experiment Station, Fort Collins, Colorado. General Technical Report (RM-166): 1-458.
- Hayes, M. P. and D. M. Krempels. 1986. Vocal sac variation among frogs of the genus *Rana* from western North America. *Copeia* 1986(4):927-936.
- Hayes, M. P. and M. M. Miyamoto. 1984. Biochemical, behavioral and body size differences between *Rana aurora aurora* and *R. a. draytonii*. *Copeia* 1984(4):1018-1022.
- Hayes, M. P., and M. R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog, *Rana aurora draytonii* (Ranidae). *Southwestern Naturalist* 30(4): 601-605.
- Hels, T. and E. Buchwald. 2001. The effect of road kills on amphibian populations. *Biological Conservation* 99: 331-340.
- Hilty, J. A. and A. M. Merenlender. 2004. Use of riparian corridors and vineyards by mammalian predators in Northern California. *Conservation Biology* 18: 126-135.
- Holt, R. D. 1993. Ecology at the mesoscale: the influence of regional processes on local communities. In: *Species Diversity in Ecological Communities* (editors Ricklefs, R. & Schluter, D.). University of Chicago Press, Chicago, Illinois, pages 77-88.
- Hunt, L. 1993. Letter to Marvin L. Plenert, Regional Director, U.S. Fish and Wildlife Service, Portland, Oregon, regarding proposed listing.

Jennings, M. R. 1993. Letter to Peter C. Sorensen, U.S. Fish and Wildlife Service, Sacramento, California.

Jennings, M. R., and M. P. Hayes. 1985. Pre-1900 overharvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for bullfrog (*Rana catesbeiana*) introduction. *Herpetological Review* 31(1):94-103.

_____. 1990. Final report of the status of the California red-legged frog (*Rana aurora draytonii*) in the Pescadero Marsh Natural Preserve. Final report prepared for the California Department of Parks and Recreation, Sacramento, California, through Agreement (4-823-9018). Department of Herpetology, California Academy of Sciences, Golden Gate Park, San Francisco, California. 30 pages.

_____. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Rancho Cordova, California. 255 pages.

Jennings, M. R., M. P. Hayes, and D. C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog (*Rana aurora draytonii*) and the western pond turtle (*Clemmys marmorata*) on the list of endangered and threatened wildlife and plants. 21 pages.

Kupferberg, S. J. 1996a. Hydrologic and Geomorphic Factors Affecting Conservation of a River-Breeding Frog (*Rana boylei*). *Ecological applications* 6:1322-1344.

_____. 1996b. The Ecology of Native Tadpoles (*Rana boylei* and *Hyla regilla*) and the Impacts of Invading Bullfrogs (*Rana catesbeiana*) in a Northern California River. PhD dissertation. University of California, Berkeley, California.

_____. 1997. Bullfrog (*Rana catesbeiana*) Invasion of a California River: The Role of Larval Competition. *Ecology* 78(6):1736-1751.

Kruse, K. C. and M. G. Francis. 1977. A predation deterrent in larvae of the bullfrog, *Rana catesbeiana*. *Transactions of the American Fisheries Society* 106(3):248-252.

La Polla, V. N. and G. W. Barrett. 1993. Effects of corridor width and presence on the population dynamics of the meadow vole (*Microtis pennsylvanicus*). *Landscape Ecology* 8:25-37.

Levins, R. A. 1970. Extinction. *American Mathematical Society* 2: 77-107.

Lindenmayer, D. B., and H. P. Possingham. 1996. Modeling the interrelationships between habitat patchiness, dispersal capability and metapopulation persistence of the endangered species, Leadbeater's possum, in southeastern Australia. *Landscape Ecology* 11:79-105.

- Lips K. R., D. E. Green, and R. Papendick. 2003. Chytridiomycosis in wild frogs from southern Costa Rica. *Journal of Herpetology* 37(1): 215-218.
- MacArthur, R. A., R. H. Johnston, and V. Geist. 1979. Factors in influencing heart rate in free-ranging bighorn sheep: a physiological approach to the study of wildlife harassment. *Canadian Journal of Zoology* 57: 2010-2021.
- Mallick, S. A., G. J. Hocking, and M. M. Driessen. 1998. Road-kills of the eastern barred bandicoot (*Perameles gunnii*) in Tasmania: an index of abundance. *Wildlife Research* 25: 139-145.
- Mao, J., D. E. Green, G. M. Fellers, and V. G. Chincar. 1999. Molecular characterization of iridoviruses isolated from sympatric amphibians and fish. *Virus Research* 6: 45-52.
- Moyle, P. B. 1976. Fish Introductions in California: History and Impact on Native Fishes. *Biological Conservation* 9(1):101-118.
- Munguira, M. L. and J. A. Thomas. 1992. Use of road verges by butterfly and moth populations, and the effect of roads on adult dispersal and mortality. *Journal of Applied Ecology* 29: 316-329.
- Petit, R. J., N. Bahrman, and P. Baradat. 1995. Comparison of genetic differentiation in maritime pine (*Pinus pinaster* Ait) estimated using isozymes, total proteins and terpenic loci. *Heredity* 75; 382-389.
- Shaffer, H. B., G.M. Fellers, S. R. Voss, C. Oliver, and G.B. Pauley. 2010. Species boundaries, phylogeography, and conservation genetics of the red-legged frog (*Rana auroraldraytonii*) complex. *Molecular ecology* 13: 2667-2677.
- Stamps, J. A., M. Buechner and V. V. Krishnan. 1987. The Effects of Edge Permeability and Habitat Geometry on Emigration from Patches of Habitat. *The American Naturalist* 129 (4): 533-552.
- Stebbins, R. C. 2003. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts.
- Storer, T. I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27:1-1-342.
- _____. 1933. Frogs and their commercial use. California Department of Fish and Game 19(3)203-213.

- Stuart, J. M., M. L. Watson, T. L. Brown, and C. Eustice. 2001. Plastic netting: an entanglement hazard to snakes and other wildlife. *Herpetological Review* 32(3): 162-164.
- Tatarian, P. J. 2008. Movement Patterns of California Red-Legged Frogs (*Rana Draytonii*) in an Inland California Environment. *Herpetological Conservation and Biology* 3(2):155-169. November.
- Trombulak, S. C. and C. A. Frissell. 2000. The ecological effects of roads on terrestrial and aquatic communities: a review. *Conservation Biology* 14:18-30.
- Twedt, B. 1993. A comparative ecology of *Rana aurora* Baird and Girard and *Rana catesbeiana* Shaw at Freshwater Lagoon, Humboldt County, California. Unpublished. Master of Science thesis. Humboldt State University, Arcata, California. 53 pages plus appendix.
- U.S. Fish and Wildlife Service (Service). 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). Portland, Oregon. 173 pages.
- Van der Zande, A. N., W. J. ter Keurs, and W. J. Van der Weijden. 1980. The impact of roads on the densities of four bird species in an open field habitat - evidence of a long-distance effect. *Biological Conservation* 18: 299-321.
- Van Gelder, J. J. 1973. A quantitative approach to the mortality resulting from traffic in a population of *Bufo bufo* L. *Oecologia* 13:93-95.
- Verboom, B. and R. Apeldoorn. 1990. Effects of habitat fragmentation on the Red squirrel *Sciurus vulgaris*. *Landscape Ecology* 4: 171-176.
- Verboom, B. J., K. Lankester, and J. A. Metz. 1991. Linking local and regional dynamics in stochastic metapopulation models. *Biological Journal Linnean Society* 42:39-55.
- Vos, C. C. and J. P. Chardon. 1998. Effects of habitat fragmentation and road density on the distribution pattern of the moor frog, *Rana arvalis*. *Journal of Applied Ecology* 35: 44-56.
- Weldon, C., L. H. du Preez, A. D. Hyatt, R. Muller, and R. Speare. 2004. Origin of the Amphibian Chytrid Fungus. *Emerging Infectious Diseases*. 10(12): 2100-2105.
- With, K. A. and T. O Crist. 1995. Critical threshold in species' responses to landscape structure. *Ecology* 76:2446-2459.
- Wright, A. H. and A. A. Wright. 1949. Handbook of frogs and toads of the United States and Canada. Comstock Publishing Company, Inc., Ithaca, New York. 640 pages.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846



In Reply Refer To:
81420-2011-F-0590-R001-1

Ms. Mary Oliva
Northern San Joaquin Valley
Environmental Management Branch
California Department of Transportation
P.O. Box 2048
Stockton, California 95201

APR 22 2013

Subject: Reinitiation of the Biological Opinion for the Proposed State Route 116 Pocket Canyon Creek Retaining Wall Replacement Project, Sonoma County, California (Caltrans EA 04-1G420)

Dear Ms. Oliva:

This is in response to California Department of Transportation's (Caltrans) March 20, 2013, request to reinitiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed State Route (SR) 116 Pocket Canyon Creek Retaining Wall Replacement Project in Sonoma County, California. At issue are the potential effects on the threatened California red-legged frog (*Rana draytonii*).

The original Biological Opinion (BO) was issued for the project on February 21, 2012 (Service File #81420-2008-F-0827). The reinitiation of consultation is prompted by changes to the project design. The project design modification consists of lengthening the proposed temporary water diversion system from 175 feet to 200 feet. The additional 25 feet will be located in the previously described action area.

This amendment has been prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.)(Act) and is based on: (1) the February 21, 2012, BO (Service File #81420-2011-F-0590-3); (2) Caltrans' March 20, 2013, request for reinitiation; and (3) other information available to the Service.

Add the following to the Consultation History in the February 21, 2012 BO:

February 21, 2012	The Service issued the BO (Service File #81420-2011-F-0590-3).
March 18, 2013	Caltrans contacted the Service via telephone to discuss modifications to the project description. The Service

recommended that Caltrans reinitiate consultation so the effects associated with the modification could be included in the consultation. Via an electronic mail message, Caltrans provided the Service with design drawings depicting the design modification.

March 22, 2013

The Service received Caltrans' March 20, 2013, request to reinitiation formal consultation based on the project description change.

As described in the original BO, the water diversion system will be located within Pocket Canyon Creek. No vegetation will be removed within the creek bed and no excavation will be needed for the installation of the temporary diversion. Gravel-filled bags and a 36-inch high density pipe will be placed in the bed of the creek using a coffer dam (upstream) and a downstream berm to divert water.

The 200-foot diversion system will be located within the originally described 0.218-acre construction footprint. The modification will likely adversely affect the California red-legged frog by temporarily removing an additional 25 feet of aquatic habitat that was not addressed in the original BO. Due to the diversion system, 200 feet of riverine habitat used by the frog for refuge, foraging, and movement will be unavailable during construction. The project modification is not expected to result in other adverse effects to the California red-legged frog not analyzed in the original BO.

Please contact John Cleckler, Caltrans Liaison (John_Cleckler@fws.gov) or Ryan Olah, Coast-Bay/Forest Foothills Division Chief (Ryan_Olah@fws.gov), at the letterhead address, (916) 414-6600, or by electronic mail if you have any questions regarding this reinitiation of consultation for the proposed State Route 116 Pocket Canyon Creek Retaining Wall Replacement Project.

Sincerely,



for
Cay C. Goude
Assistant Field Supervisor

cc:

Scott Wilson and Adam McKannay, California Department of Fish and Game, Yountville, California

Joel Casagrande, National Marine Fisheries Service, Santa Rosa, California

Sean Anayah, California Department of Transportation, Stockton, California



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

December 21, 2011

In response refer to:
2011/03897

Christine Cox-Kovacevich
Caltrans Central Region Deputy Director
855 M Street, Suite 200
Fresno, California 93721

Dear Ms. Kovacevich:

Thank you for your agency's letter of August 2, 2011, requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Effective July 1, 2007, the Federal Highway Administration (FHWA) assigned, and the California Department of Transportation (Caltrans) has assumed all responsibilities for consultation and approval on most highway projects in California. Therefore, Caltrans is now considered the federal action agency for ESA consultations with NMFS for federally funded projects. This letter transmits NMFS' biological opinion for Caltrans proposed bank stabilization project on Pocket Canyon Creek along Highway 116 near the town of Guerneville, in Sonoma County, California. The enclosed biological opinion is based on our review of Caltrans' proposed project and describes NMFS' analysis of the potential effects on the threatened Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) and designated critical habitat for the CCC coho salmon (*O. kitsuch*) Evolutionary Significant Unit (ESU) and CCC steelhead DPS, in accordance with the ESA.

In the enclosed biological opinion, NMFS concludes the Pocket Canyon Creek – Highway 116 bank stabilization project is not likely to jeopardize the continued existence of the CCC steelhead DPS. NMFS has also concluded the project is not likely to result in the destruction or adverse modification of critical habitat for CCC coho salmon or CCC steelhead. However, NMFS anticipates take of listed CCC steelhead may occur as a result of project construction. An incidental take statement with non-discretionary terms and conditions is included with the enclosed biological opinion. In addition, conservation recommendations have been included in the enclosed biological opinion.

This letter also transmits NMFS' Essential Fish Habitat (EFH) conclusions pursuant to section 305(b) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA). Within the action area, Pocket Canyon Creek is identified as EFH for CCC coho salmon, which



is managed under the Pacific Coast Salmon Fishery Management Plan (FMP). The proposed action has the potential to adversely affect EFH. However, the proposed action contains adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. With the terms and conditions set forth in the biological opinion, NMFS has no additional EFH Conservation Recommendations to provide.

If you have any questions regarding the enclosed biological opinion, please contact Mr. Joel Casagrande at (707) 575-6016, or joel.casagrande@noaa.gov.

Sincerely,

For 
Rodney R. McInnis
Regional Administrator

Enclosure

cc: Chris Yates, NMFS, Long Beach
Mary Oliva, Rachel Kleinfelter, Caltrans, Stockton
John Cleckler, USFWS, Sacramento
Adam McKannay, CDFG, Yountville
Copy to file 151422SWR2011SR00430

BIOLOGICAL OPINION

ACTION AGENCY: California Department of Transportation (Caltrans)

ACTION: Pocket Canyon Creek – Highway 116 Bank Stabilization Project,
Sonoma County, California

**CONSULTATION
CONDUCTED BY:** National Marine Fisheries Service, Southwest Region

TRACKING NUMBER: 2011/03897

DATE ISSUED: December 21, 2011

I. CONSULTATION HISTORY

The California Department of Transportation (Caltrans) will be acting as the lead agency as per the agreement with the Federal Highway Administration (FHWA) in accordance with Section 6005 (a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (PL-109-59) to assume the FHWA Secretary's responsibilities under the National Environment Policy Act of 1969 (42 USC § 4351, *et seq.*) and all or part of the FHWA Secretary's responsibilities for environmental review, consultation, or other action required under any environmental law with respect to one or more highway projects within the state.

Caltrans contacted NOAA's National Marine Fisheries Service (NMFS) on May 17, 2011, seeking technical assistance and guidance for the repair of a failed retaining wall along Pocket Canyon Creek and Highway 116 located near the town of Guerneville in Sonoma County, California. Between May 17 and July 29, 2011, NMFS provided technical assistance to Caltrans which included discussions on the salmonid species likely to be present and critical habitat designations in the proposed action area, construction windows for these species, general channel dewatering strategies, and designs of the proposed retaining wall. A site visit was conducted on June 20, 2011, to observe existing habitat and infrastructure conditions within the proposed action area and to further assess proposed designs for the repair of the wall. Staff from Caltrans, the United States Fish and Wildlife Service (USFWS) and NMFS attended the site visit.

On August 2, 2011, Caltrans requested formal consultation with NMFS pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*) on the effects of the proposed Pocket Canyon Creek – Highway 116 Bank Stabilization Project on the threatened Central California Coast (CCC) coho salmon (*Oncorhynchus kisutch*) Evolutionarily Significant Unit (ESU) and the threatened CCC steelhead (*O. mykiss*) Distinct Population Segment (DPS), and critical habitat designated for CCC coho salmon and CCC steelhead. After reviewing the letter and the enclosed Biological Assessment (Caltrans 2011), NMFS determined

additional information was necessary to initiate consultation for the proposed project. On September 1, 2011, NMFS sent a letter to Caltrans requesting clarification of specific details of the proposed project, including channel access and retaining wall design, and requesting additional information that was not included in the original initiation package. On November 4, 2011, NMFS received the remaining information from Caltrans needed to initiate formal consultation.

II. DESCRIPTION OF THE PROPOSED ACTION

Caltrans proposes to use funding from FHWA to repair storm damage to a slope and retaining wall along the eastbound lane of Highway 116 in Sonoma County east of the town of Guerneville at post mile (PM) 13.76. The slope is part of Pocket Canyon Creek's stream bank at this location. In 2010, storm damage undermined the existing slope and overturned the retaining wall. Emergency work, conducted that summer, was necessary to stabilize the road bed and consisted of temporary slope repair. Caltrans now proposes to remove and replace the failed retaining wall, replace a culvert, and widen the eastbound traffic lane. Work will be done using heavy equipment. The entire project will be completed during one dry season between July 1 and October 15 and is not expected to last more than 60 days. Caltrans anticipates the project will go to construction in either 2013 or 2014, but may start as late as 2017. There are no interrelated or interdependent actions associated with this project.

A. Description of Project Activities

The proposed project includes the following: 1) removal of the existing failed retaining wall; 2) construction of a 130-foot long soldier pile retaining wall along the eastbound direction of Highway 116; 3) in-kind replacement of a buried culvert that carries surface runoff from adjacent property under Highway 116 into Pocket Canyon Creek; and 4) widening the existing eastbound lane to a standard 12-foot lane with a 4-foot shoulder. Dewatering will most likely be required to complete the construction of the retaining wall. Caltrans will incorporate several measures to minimize the magnitude, extent, and duration of potential impacts, including limiting in-water construction activities to the summer low-flow period, using cofferdams to isolate the construction areas from the flowing stream, restricting access to the stream to a single access road, and implementing a re-vegetation and monitoring plan that is approved by NMFS.

Stream flow is likely to be present within the action area during the start of the in-channel work, and therefore a stream flow diversion will be necessary to replace the failed retaining wall. A temporary coffer dam will be utilized to divert water around the worksite. Prior to construction of the cofferdam, block nets will be placed at the upstream and downstream end of the area to be dewatered. Once the nets are in place, a NMFS approved fisheries biologist will capture and relocate salmonids from this section of the creek until they are confident few or no fish remain. Fish will be captured using authorized methods (*i.e.*, backpack electrofishing and seining) and relocated to suitable habitat upstream of the construction area. A cofferdam will be constructed at the upstream end of the dewatered section out of gravel-filled bags (using clean, washed gravel) and an earthen berm will be constructed at the downstream end. A 36-inch high-density

polyvinyl chloride pipe will be placed in the creek channel which will be used to divert the stream flow through the action area. The total length of the dewatered section will be no more than 175 feet. If necessary, pumps will be used to remove standing water from the dewatered section of the creek to water storage containers or a temporary detention or filtration basin away from the stream channel to prevent direct discharge of this water to the creek. Pump intakes will be screened in accordance with NMFS criteria to prevent accidental entrainment of juvenile salmonids. Fish relocation efforts will continue as needed during pumping activities to ensure no salmonids are left behind in the drying channel.

Prior to construction of the new soldier pile wall, the failed section of the retaining wall, which is approximately 50 feet long and remains partially overturned in Pocket Canyon Creek, will need to be removed. The existing retaining wall section will be removed from the creek channel after the creek channel is dewatered. Equipment will be required in the creek channel bed to remove soil from the top of the wall footing and to break the wall into smaller sections. The smaller sections will then be removed by equipment staged on the roadway.

Caltrans will construct a new 130-foot long soldier pile retaining wall parallel to and between the eastbound lane of Highway 116 and Pocket Canyon Creek that will replace the existing failed wall and stabilize the slope between Highway 116 and Pocket Canyon Creek. The wall will consist of steel piles with concrete lagging and the piles will be drilled into the bank from the highway. The wall would extend approximately 15 feet above the creek bed and would also serve as a headwall for a 36-inch culvert which drains a small catchment underneath Highway 116 into the creek. To avoid further scouring, the new soldier pile wall would need to be treated using a stone or concrete finish. A 20 to 30-foot section of the wall comes into contact with the creek channel due to a bend in the creek. For this section, the footing of the wall would extend an additional 10 feet below the creek bed which will require excavation in the creek channel. In addition, to avoid scour, rock slope protection (RSP) will be placed in front of a larger portion of the wall (approximately 60 of its 130-foot total length) that overlaps the smaller 20-30-foot section with the extended footing. The keyed RSP will be buried below channel grade to a depth of five feet and will extend approximately five feet above the channel bottom. The RSP will extend eight feet at its maximum width from the new wall into the creek channel, but because the new wall will be constructed farther away from the creek than the existing wall, the channel will be able to accommodate the RSP without resulting in a decrease in channel capacity or impacts to stream flow conditions. All RSP will be placed at the base of the wall from the highway. Based on Caltrans' projected velocities and stream flow volumes at the site, Caltrans will use RSP material that is 25 to 75 pounds, with a diameter that will vary between 0.75 to 1.0 feet. In addition, the RSP will be planted with vegetation plugs consisting of native riparian species found at the project site. It will take 50 days to construct the soldier pile wall and will require the following equipment: excavator, drilling equipment such as a crane with auger, and a bobcat loader. A dirt access ramp to the channel bed will be used for equipment access, which will be located west (downstream) of the existing retaining wall and will require some vegetation removal and trimming. All remaining work will be conducted from the roadway.

The Highway 116 road bed will be widened to provide a standard 12-foot lane with a 4-foot shoulder in the eastbound direction. Part of the eastbound shoulder would be a cantilevered slab

on top of the shoulder pile retaining wall. A concrete barrier is proposed at the edge of the shoulder on the eastbound direction on top of the wall. The solid concrete barrier is being constructed for safety due to the vertical drop-off in front of the soldier pile retaining wall. The 36-inch corrugated steel pipe culvert running under Highway 116 would need to be replaced in-kind. These activities will be done from the roadway and will not require creek access.

Construction of the project will require one-lane, one-way reversible traffic control with a temporary traffic signal. Construction equipment will be parked on the roadway behind the temporary K-rails while reversible traffic control is in process. A flat area on the northwest side of Highway 116 adjacent to a private driveway would be used as an area for stockpiling and construction staging.

Caltrans has proposed to implement several BMPs and minimization measures throughout the project. These are specified in detail in Caltrans (2011) and include the following: (1) conducting pre-project surveys for ESA-listed species; (2) conducting construction staff training on species identification and habitat requirements prior to beginning the project; (3) installing environmentally sensitive fencing to outline and protect existing riparian habitats; (4) implementing a Water Pollution Control Plan and erosion control features; (5) limiting vegetation clearing to the greatest extent possible; (6) developing a re-vegetation plan which will be reviewed and approved by NMFS no later than 60 calendar days prior to groundbreaking; (7) complying with Federal Executive Order 13112 to reduce the spread of invasive non-native plant species (all imported fill will be certified non-toxic and weed free); (8) developing and implementing a spill response plan; and (9) conducting work on the retaining wall, as much as possible, from the highway.

B. Action Area

The action area is located near the town of Guerneville, Sonoma County, California, along Pocket Canyon Creek and Highway 116. The action area for the proposed project includes the direct impact area (up to the elevation of ordinary high water), which is approximately 175 feet in length, and approximately 1,000 feet of the creek downstream of the dewatered section. NMFS expects there will be temporary increases in turbidity related to the construction and removal of dewatering facilities. Adverse effects related to increased turbidity are not expected to extend beyond approximately 1,000 feet, at which point, much of the suspended material will have settled and the effects related to the turbidity will have become negligible. The 1,000 foot extended impact area is based on observations by NMFS staff (Joel Casagrande, NMFS Biologist, personal observation, 2010) of the downstream extent of turbidity during similar activities at another (*e.g.*, Uvas Creek, Santa Clara County) project site in Central California where substrate quality was similar but summer stream flows were substantially greater (discussed in greater detail in the Effects of the Action section). The total action area will constitute approximately 1,175 feet of Pocket Canyon Creek.

III. ANALYTICAL FRAMEWORK

A. Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which evaluates the ESU's and/or DPS's range-wide conditions, the factors responsible for that condition, and the species' likelihood of both survival and recovery; (2) the Environmental Baseline, which evaluates the condition of the ESA-listed salmonid species in the action area, the factors responsible for that condition, and the relationship of the action area to the likelihood of both survival and recovery of the ESA-listed salmonids; (3) the Effects of the Action, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species in the action area; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the ESA-listed salmonid species.

The jeopardy determination is made by adding the effects of the proposed Federal action and any Cumulative Effects to the Environmental Baseline and then determining if the resulting changes in species status in the action area are likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these listed species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on the range-wide likelihood of both survival and recovery of these listed species and the role of the action area in the survival and recovery of the listed species. The significance of the effects of the proposed Federal action is considered in this context, taken together with cumulative effects, for purposes of making the jeopardy determination. We use a hierarchical approach that focuses first on whether or not the effects on ESA-listed salmonid species in the action area will impact their respective population. If the population will be impacted, we assess whether this impact is likely to affect the ability of the populations to support the survival and recovery of the ESU and/or DPS.

B. Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of destruction or adverse modification of critical habitat at 50 CFR 402.02.¹ Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

The adverse modification analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, which evaluates the range-wide condition of critical habitat for the ESA-listed salmonids in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended conservation value of the critical habitat overall; (2) the Environmental Baseline, which evaluates the condition of critical habitat in the action area, the factors responsible for that condition, and the conservation value of the critical habitat in the action area; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs in the action area and how that will influence the conservation value of affected critical

¹ This regulatory definition has been invalidated by Federal Courts.

habitat units; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the conservation value of affected critical habitat units.

For purposes of the adverse modification determination, we add the effects of the proposed Federal action on the ESA-listed salmonid species' critical habitat in the action area, and any Cumulative Effects, to the Environmental Baseline and then determine if the resulting changes to the conservation value of critical habitat in the action area are likely to cause an appreciable reduction in the conservation value of critical habitat range-wide. If the proposed action will negatively affect PCEs of critical habitat in the action area we then assess whether or not this reduction will impact the value of the ESU and/or DPS critical habitat designation as a whole.

C. Use of Best Available Scientific and Commercial Information

To conduct the assessment, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in a number of documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the effects of the project's actions on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was formulated from the aforementioned resources, the biological assessment for this project, and project meeting notes if applicable. For information that has been taken directly from published, citable documents, those citations have been referenced in the text and listed at the end of this document.

IV. STATUS OF THE SPECIES/CRITICAL HABITAT

This biological opinion analyzes the effects of the Pocket Canyon Creek – Highway 116 bank stabilization project on the CCC steelhead DPS listed as threatened under the ESA (71 FR 834; January 5, 2006). The action area is within the designated critical habitat for CCC coho salmon (64 FR 24049; May 5, 1999) and CCC steelhead (70 FR 52488; September 2, 2005).

The historic and present use of Pocket Canyon Creek by CCC coho salmon is unknown. The Pocket Canyon Creek Watershed is adjacent to several drainages within the Russian River Watershed (*e.g.*, Dutch Bill Creek, Green Valley Creek, and Austin Creek) that have supported coho salmon populations both historically and currently. On June 20, 2011, habitat conditions in the action area (located at the downstream end of the watershed), as observed by NMFS staff, were very poor and deemed not suitable as rearing habitat for juvenile coho salmon (*e.g.*, shallow flow, lack of complex pools, and abundant fine sediment). This assessment was shared by Bill Cox, retired California Department of Fish and Game (CDFG) Fisheries Biologist, who also conducted a site visit in late June 2011 to assess general habitat conditions for both juvenile salmonids and freshwater shrimp (B. Cox, personal communication, August 2011). Based on the time of year the project will be implemented (July – October) and the unsuitable rearing habitat conditions for coho salmon at the project location, NMFS assumes juvenile coho salmon will not

be present in the action area during project implementation. Therefore, effects to CCC coho salmon are not assessed further in this biological opinion. This biological opinion will only analyze affects to juvenile CCC steelhead, which are generally more tolerable of impacted habitat conditions.

A. Species Description, Life History, and Status

In this opinion, NMFS assesses four population viability parameters to help us understand the status of CCC steelhead and the population's ability to survive and recover. These population viability parameters are: abundance, population growth rate, spatial structure, and diversity (McElhany *et al.* 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information to determine the general condition of each population and factors responsible for the current status of the DPS.

We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20). For example, the first three parameters are used as surrogates for numbers, reproduction, and distribution. We relate the fourth parameter, diversity, to all three regulatory criteria. Numbers, reproduction, and distribution are all affected when genetic or life history variability is lost or constrained resulting in reduced population resilience to environmental variation at local or landscape-level scales.

1. General Life History

Steelhead are anadromous forms of *O. mykiss*, spending some time in both freshwater and saltwater. Steelhead young usually rear in freshwater for one to three years before migrating to the ocean as smolts. Migration to the ocean usually occurs in the spring. Steelhead may remain in the ocean for one to five years (two to three years is most common) before returning to their natal streams to spawn (Busby *et al.* 1996, Moyle 2002). The distribution of steelhead in the ocean is not well known. Coded wire tag recoveries indicate that most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986). The timing of upstream migrating CCC steelhead adults is correlated with higher flow events, in winter or spring. In contrast to other species of *Oncorhynchus*, steelhead may spawn more than one season before dying (iteroparity); although one-time spawners represent the majority.

Because rearing juvenile steelhead reside in freshwater all year, adequate flow and temperature are important at all times. Outmigration appears to be more closely associated with size than age. In Waddell Creek, Shapovalov and Taft (1954) found steelhead juveniles migrating downstream at all times of the year, with the largest numbers of young-of-year (YOY, or Age 0+) and yearlings (Age 1+) steelhead moving downstream during spring and summer. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Meehan and Bjornn 1991). However, juvenile steelhead tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids (Everest and Chapman 1972, Smith and Li 1983). Young steelhead feed on a

wide variety of drifting aquatic and terrestrial insects (Everest and Chapman 1972, Moyle 2002). In winter, juvenile steelhead become less active and hide in available cover, including gravel or woody debris (Moyle 2002).

Water temperature can influence the metabolic rate, distribution, abundance, growth, and habitat use of rearing juvenile steelhead (Smith and Li 1983, Barnhart 1986, Bjornn and Reiser 1991, Myrick and Cech 2005). Optimal temperatures for steelhead growth range between 10 and 20 degrees (°) Celsius (C) (Hokanson *et al.* 1977, Wurtsbaugh and Davis 1977, Myrick and Cech 2005). Fluctuating diurnal water temperatures are also important for the survival and growth of salmonids (Busby *et al.* 1996). Suspended sediment concentrations, or turbidity, also can influence the distribution and growth of steelhead (Bell 1973, Sigler *et al.* 1984, Newcombe and Jensen 1996). Bell (1973) found suspended sediment loads of less than 25 milligrams per liter (mg/L) were typically suitable for rearing juvenile steelhead.

2. Status of CCC Steelhead DPS

Historically, approximately 70 populations² of steelhead existed in the CCC steelhead DPS (Spence *et al.* 2008). Many of these populations (about 36) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (Spence *et al.* 2008). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhaney *et al.* 2000, Bjorkstedt *et al.* 2005).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960's, including 50,000 fish in the Russian River – the largest population within the DPS (Busby *et al.* 1996). Near the end of the 20th Century, McEwan (2001) estimated the wild run population in the Russian River Watershed was between 1,700-7,000 fish. Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with recent estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Soquel, and Aptos creeks) of individual run sizes of 500 fish or less. For more detailed information on trends in CCC steelhead abundance, see: NMFS 1997 and Good *et al.* 2005.

Some loss of genetic diversity has been documented and attributed to previous among-basin transfers of stock and local hatchery production in interior populations in the Russian River (Bjorkstedt *et al.* 2005). Reduced population sizes and fragmentation of habitat in San Francisco streams has likely also led to loss of genetic diversity in these populations.

CCC steelhead have experienced a serious decline in abundance and long-term population trends suggest a negative growth rate. This indicates the DPS may not be viable in the long term. DPS populations that historically provided enough steelhead immigrants to support dependent

² Population as defined by Bjorkstedt *et al.* 2005 and McElhaney *et al.* 2000 as, in brief summary, a group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group. Such fish groups may include more than one stream. These authors use this definition as a starting point from which they define four types of populations (not all of which are mentioned here).

populations may no longer be able to do so, placing dependent populations at increased risk of extirpation. However, because CCC steelhead have maintained a wide distribution throughout the DPS, roughly approximating the known historical distribution, CCC steelhead likely possess a resilience that is likely to slow their decline relative to other salmonid DPSs or ESUs in worse condition. The most recent status review concludes steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Good *et al.* 2005), a conclusion that was consistent with a previous assessment (Busby *et al.* 1996) and supported by the most recent NMFS Technical Recovery Team work (Spence *et al.* 2008). On January 5, 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834). Data from the 2008/09, 2009/10, and 2010/2011 adult CCC steelhead returns indicate a decline in returning adults across their range compared to other recent returns (*e.g.*, 2006/2007, 2007/2008) (Jeffrey Jahn, NMFS, personal communication, December 2011). For example, counts of returning adult steelhead in 2009 and 2010 at both Warm Springs Dam (Dry Creek, Russian River Watershed) and Lake Mendocino Dam (East Fork Russian River) have been lower than the average returns the previous ten years (Jeffrey Jahn, NMFS personal communication, December 2011).

3. Status of Critical Habitat

The condition of critical habitat for the CCC steelhead DPS and CCC coho salmon ESU, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined present depressed population conditions are, in part, the result of multiple human-induced factors affecting critical habitat including: logging, agricultural and mining activities, urbanization, stream channelization, dams, wetland loss, and water withdrawals, including unscreened diversions for irrigation. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large woody debris, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, increases in sedimentation in streams from upland areas, loss of shade (higher water temperatures) and loss of nutrient inputs (61 FR 56138, Busby *et al.* 1996, 70 FR 52488). Depletion and storage of natural river and stream flows have drastically altered natural hydrologic cycles in many of the stream and stream reaches designated as critical habitat. Alteration of flows results in migration delays, loss of suitable habitat due to dewatering and blockage; stranding of fish from rapid flow fluctuations; entrainment of juveniles into poorly screened or unscreened diversions, and increased water temperatures harmful to salmonids. Overall, current condition of CCC steelhead and CCC coho salmon critical habitat is degraded, and may not provide the conservation value necessary for the recovery of the species.

B. Factors Responsible for Salmonid Stock Declines

NMFS cites many reasons (primarily anthropogenic) for the decline of salmonids (Busby *et al.* 1996, Good *et al.* 2005). The foremost reason for the decline in these anadromous populations is the degradation and/or destruction of freshwater and estuarine habitat, including critical habitat, caused by (as described briefly above) anthropogenic disturbances such as urban development,

agriculture, logging, water resource development, and dams. Additional factors contributing to the decline of these populations include: poor estuary/lagoon management (Smith 1990, Bond 2006), commercial and recreational harvest, artificial propagation (Waples 1991), natural stochastic events, marine mammal predation (NMFS 1999, Hanson 1993), reduced marine-derived nutrient transport (Bilby *et al.* 1996, Bilby *et al.* 1998, and Gresh *et al.* 2000), and most recently poor ocean conditions (Lindley *et al.* 2009).

C. Global Climate Change

Modeling of climate change impacts in California suggests average summer air temperatures are expected to increase (Lindley *et al.* 2007). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe *et al.* 2004). Total precipitation in California may decline; critically dry years may increase (Lindley *et al.* 2007, Schneider 2007). The Sierra Nevada snow pack is likely to decrease by as much as 70 to 90 percent by the end of this century under the highest emission scenarios modeled (Luers *et al.* 2006). Wildfires are expected to increase in frequency and magnitude, by as much as 55 percent under the medium emissions scenarios modeled (Luers *et al.* 2006). Vegetative cover may also change, with decreases in evergreen conifer forest and increases in grasslands and mixed evergreen forests. The likely change in amount of rainfall in northern and central coastal streams under various warming scenarios is less certain, although as noted above, total rainfall across the state is expected to decline. For the California North Coast, some models show large increases (75 to 200 percent) while other models show decreases of 15 to 30 percent (Hayhoe *et al.* 2004). Many of these changes are likely to further degrade salmonid habitat by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002). In marine environments, ecosystems and habitats important to sub-adult and adult salmonids are likely to experience changes in temperatures, circulation and chemistry, and food supplies (Feely *et al.* 2004, Brewer 2008, Osgood 2008, Turley 2008). The projections described above are for the mid to late 21st Century. In shorter time frames natural climate conditions are more likely to predominate (Cox and Stephenson 2007, Smith *et al.* 2007).

V. ENVIRONMENTAL BASELINE

The environmental baseline is the current status of the species and critical habitat in the action area based on analysis of the effects of past and ongoing human and natural factors. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The proposed project is located in the lower portion of Pocket Canyon Creek, a tributary to the Russian River in the coastal mountains in central Sonoma County. The action area is located just east of the town of Guerneville and approximately 2.4 stream kilometers from the Russian River

confluence. Runoff from private property owned by Korbel (12245 Pocket Canyon Highway) and the Caltrans right-of-way is collected into a drainage ditch, which then flows through a 36-inch corrugated steel pipe culvert beneath Highway 116 and into Pocket Canyon Creek.

Within the action area, the creek flows in a low gradient channel that is entrenched (approximately 15 feet below top of bank), and supports a dense riparian canopy consisting of willow (*Salix spp.*), alder (*Alnus spp.*), and California bay (*Umbellularia californica*). Substrate in the creek channel consists primarily of small gravel with sand and other fine sediments. Highway 116 parallels the creek's right bank. The historic floodplain along the left bank consists of a small open meadow. Access to the meadow floodplain appears to be disconnected. The riparian canopy consists of red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), red alder (*Alnus rubra*), and California bay (*Umbellularia californica*) with an understory of Himalyan blackberry (*Rubus discolor*), common horsetail (*Equisetum laevigatum*), poison hemlock (*Conium maculatum*), and poison oak (*Toxicodendron diversilobum*) (Caltrans 2011). The dominant land cover in the Pocket Canyon Creek Watershed is primarily second growth coast redwood-mixed conifer forest. General land uses include rural residential, timber harvest, and vineyards.

A. Status of Critical Habitat in the Action Area

During a site visit on June 20, 2011, habitat conditions in Pocket Canyon Creek, as viewed from the Highway, appeared to be marginally suitable for summer juvenile steelhead rearing. The channel in the action area was entrenched with very limited access to the floodplain on the left bank side and no access to the floodplain on the right bank side due to the presence of Highway 116. The riparian canopy was dense and created well-shaded conditions in the creek. Stream flow in early summer following a very wet winter was low (estimated at less than 2 cfs), which formed short riffles that connected shallow pools and flat water habitats. Substrate conditions consisted primarily of small gravels with pockets of sand and finer sediments in the shallow pools. These substrate conditions are marginally suitable for rearing (*i.e.*, able to support a limited aquatic invertebrate community) but would not likely be suitable for redd survival if used for spawning by steelhead (*i.e.*, excess fine sediments).

Between 2002 and 2004, the Community Clean Water Institute (CCWI) and several volunteers monitored various water quality parameters, including turbidity, pH, dissolved oxygen, conductivity, water temperature, nitrate-nitrogen, and orthophosphate at multiple sites throughout Pocket Canyon Creek (including a site just upstream of the action area). The results of this monitoring indicated that Pocket Canyon Creek maintained good water quality conditions throughout the year that were capable of supporting salmonids (CCWI 2004). Temperatures averaged less than 57 degrees (°) Fahrenheit (F) during the summer rearing period, and mean turbidity levels were 3 Nephelometric Turbidity Units. The primary limitation for salmonids was the scarcity of water in the channel.

Based on the above information, NMFS believes the overall PCEs for rearing are somewhat degraded because some essential elements (*e.g.*, fine sediments and low flows) may have been adversely impacted by past logging and agricultural related activities upstream of the action area.

The PCEs for migration through the action area are considered good, as no barriers to adult or juvenile migration were observed. Overall, the PCEs for spawning appear to be degraded based on relatively poor substrate quality in the action area; however, the action area is located near the terminus of the watershed and therefore most, if not all, spawning habitat is presumably located farther upstream in the watershed.

B. Status of Listed Salmonids within the Action Area

A recent CDFG document (Cox 2000) identified Pocket Canyon Creek as a stream known to support a steelhead population. The Pocket Canyon Creek steelhead population was included in the Lower Russian River population³ (Spence *et al.* 2008 – See Table A.8); a dependent population within the CCC steelhead DPS.

A letter dated April 6, 2006, by CDFG fisheries biologist Derek Acomb (Acomb 2006) states, “There are no records of a recent CDFG survey on Pocket Canyon Creek. All computer files related to Pocket Canyon appear to only summarize historical assessments. Pocket Canyon was not recently surveyed and there is no data for Pocket Canyon.” In July 1998 CDFG conducted a survey of Mays Canyon Creek (a tributary to Pocket Canyon Creek) and noted “many salmonids present at the mouth” (*i.e.*, confluence with Pocket Canyon Creek) (CDFG 2006a). Mays Canyon Creek joins Pocket Canyon Creek approximately 2 kilometers downstream of the action area near the confluence with the Russian River. Based on the information available, NMFS assumes juvenile steelhead reside in the action area during the dry season and that their numbers are low. Recent trapping and adult counts indicates the steelhead populations in the greater Russian River Basin are depressed. The Sonoma County Water Agency and the University of California Cooperative Extension have conducted salmonid out-migrant trapping in two creeks adjacent to Pocket Canyon Creek (Dutch Bill Creek to the west and Green Valley Creek to the east) and in another nearby stream (Austin Creek). In all three streams, the abundance of steelhead leaving these systems during spring and early summer has been lower than previously observed in these streams (Jeffrey Jahn, NMFS personal communication, December 2011). These data are consistent with recent low adult steelhead returns observed at counting facilities in the upper Russian River. Because Pocket Canyon Creek is nearby, and shares similar topography, hydrology, vegetation, and disturbance history, NMFS assumes steelhead numbers in Pocket Canyon Creek, including the action area, are similar to numbers in these nearby streams.

C. Factors Affecting Species Environment within the Action Area

Threats to salmonids and riparian habitat quality in Pocket Canyon Creek, including the action area, are silt and other fine sediments from roads, development, and timber harvest, low stream flows due to extraction from subsurface wells, and pollution from vineyards and septic systems (CCWI 2004, CDFG 2006a).

³ The Lower Russian River Population includes unnamed and smaller tributaries of the Russian River downstream of the confluence of Mark West Creek, but excluding Austin, Dutch Bill, Green Valley, and Mark West creeks which are identified as separate populations.

As discussed above, Caltrans conducted emergency slope repairs in early 2011 to the embankment parallel to Highway 116. These repairs were done from the top of the stream's bank and did not enter flowing waters. Slide debris between the existing wall and the scarp of the slide was excavated and a geo-synthetic reinforced embankment was constructed as a temporary repair. However, the failed retaining wall is still in-place and requires replacement to permanently stabilize the slope.

D. Previous Section 7 Consultations and Authorized Research Activities in the Action Area

No other section 7 consultations have occurred in the action area.

Section 10(a)(1)(A) research and enhancement permits and research under exemptions granted under section 4(d) of the ESA could potentially occur in the Pocket Canyon Creek Watershed in the future. Based on NOAA's Authorizations and Permits for Protected Species (APPS) website⁴, there are currently three active section 10(a)(1)(A) research and enhancement permits issued that authorize research on salmonids in the Russian River Watershed including Pocket Canyon Creek; Permit 10094 issued to CDFG Region 3, and Permits 1044 Modification 4 and 1112 Modification 2 issued to NMFS's Southwest Fisheries Science Center. There are no authorized research projects under the 2011 4(d) research program, and NMFS is unaware of any potential activities that may request coverage under the 4(d) research program in future years. In general, all research activities are closely monitored and require measures to minimize take during the research activities. As of November 2011, no take of salmonids has occurred in the action area related to research permits and NMFS is unaware of any proposed sampling in the immediate future.

VI. EFFECTS OF THE ACTION

The purpose of this section is to identify the direct and indirect effects of the proposed action, and any interrelated or interdependent activities, on threatened CCC steelhead. Data to quantitatively determine the precise effects of the proposed action on CCC steelhead are limited or not available; the assessment of effects therefore focuses mostly on qualitative identification. This approach was based on knowledge and review of the ecological literature and other relevant materials. This information was used to gauge the likely effects of the proposed project via an exposure and response framework that focuses on what stressors (physical, chemical, or biotic), directly or indirectly caused by the proposed action, that salmonids are likely to be exposed to. Next, we evaluate the likely response of salmonids to these stressors in terms of changes to salmonids survival, growth, and reproduction, and changes to the ability of PCEs to support the value of critical habitat in the action area. PCEs include sites essential to support one or more life stages of the species. These sites for migration, spawning, and rearing in turn contain physical and biological features that are essential to the conservation of the species.

⁴ <https://apps.nmfs.noaa.gov/search/search.cfm>

A. Fish Capture and Relocation

The replacement of the failed retaining wall with a new soldier pile retaining wall will require dewatering of the action area and therefore fish capture and relocation will be necessary. Prior to construction of the dewatering facilities, block nets will be placed at the upstream and downstream end of each dewatered area. Once the nets are in place, a NMFS-approved fisheries biologist will capture and relocate salmonids from the dewatered area until they are confident few or no fish remain. Fish capture and relocation will continue once the dewatering process begins in order to ensure fish are not stranded during the drawdown of the dewatered area. All steelhead captured will be relocated upstream of the action area. Based on the marginal rearing conditions present in the action area (*i.e.*, minimal stream flow, shallow pool depths, and poor overall substrate conditions) NMFS expects the total number of juvenile steelhead likely to be present in the action area to be low and no more than 35 individuals.

Caltrans proposes to use a backpack electrofisher or seines to capture and relocate steelhead. Fish capture and relocation activities pose a risk of injury or mortality to fish species. Fish collecting gear, whether passive (Hubert 1996) or active (Hayes *et al.* 1996) has some associated risk to fish, including stress, disease transmission, injury, or death. The amount of unintentional injury and mortality attributable to fish capture varies widely depending on the method used, the ambient conditions, and the expertise and experience of the field crew. Since fish relocation activities will be conducted by qualified fisheries biologists following both the CDFG and NMFS guidelines, direct effects to and mortality of steelhead during capture will be minimized. Data from years of similar salmonid relocation activities indicate average mortality rate is below one percent (Collins 2004; CDFG 2005, 2006b, 2007, 2008, 2009, 2010). Based on this information, NMFS will use three percent as the maximum amount of mortality likely from fish capture and relocation for the project; or no more than one juvenile steelhead.

Although sites selected for relocating fish should have ample habitat, in some instances relocated fish may endure short-term stress from crowding at the relocation sites. Relocated fish may also have to compete with other fish causing increased competition for available resources such as food and habitat (Keeley 2003). Stress from crowding, including increased competition for food among juvenile steelhead in the relocation areas will be minimal and temporary, because when the project is finished steelhead will be able to redistribute in the creek unimpeded. NMFS cannot estimate the number of fish affected by competition, but does not expect this impact will be large enough to affect the survival chances of individual fish. For example, the use of multiple release sites will help facilitate fish dispersion, limiting competition. Once the project is complete and following the first precipitation event, juvenile steelhead rearing space will return to the dewatered area. Despite these impacts, fish relocation operations, if necessary, are expected to significantly minimize project impacts to juvenile steelhead by removing them from areas where they would have experienced high rates of injury and mortality.

B. Dewatering

Direct effects from dewatering will occur to juvenile steelhead within this reach. Low levels of turbidity are expected to occur as a result of the cofferdam construction. Caltrans will construct

the cofferdams without the use of heavy equipment in the live stream. Fish capture and relocation will occur prior to (and after) the construction of the cofferdams. This will remove most, if not all, fish from the areas where the cofferdams will be constructed. Juvenile salmonids that avoid capture prior to the implementation of site dewatering will die if not captured while the dewatering is underway. Caltrans or its contractors will continue fish capture and relocation during the dewatering process. NMFS expects the number of juvenile salmonids that will be killed as a result of stranding during dewatering activities will be one percent or less of the fish within the action area prior to dewatering, or no more than one steelhead. During the dewatering process, the biologist on site will make every effort to collect and relocate fish that avoided capture prior to the beginning of the dewatering process.

Another manner by which juvenile salmonids may be harmed or killed during dewatering activities is to be entrained into the pumps or discharge line. To eliminate this risk, the applicant will screen all pumps according to NMFS criteria, to ensure juvenile steelhead will not be harmed by the pumps during dewatering events.

Juvenile salmonids rearing downstream of the action area may be inadvertently affected by the loss of benthic (*i.e.*, bottom dwelling) aquatic macroinvertebrate production within the dewatered area (Cushman 1985). However, effects to aquatic macroinvertebrates resulting from dewatering will be temporary because construction activities will be relatively short-lived, drift from upstream will continue through the pipe, and rapid re-colonization (about two to three months) of disturbed areas by macroinvertebrates is expected following construction (Cushman 1985, Thomas 1985, Harvey 1986).

C. Turbidity

NMFS anticipates only short-term increases in turbidity will occur during the construction and removal of cofferdams. Suspended sediment may affect salmonid feeding behavior and efficiency, resulting in reduced growth rates (Sigler *et al.* 1984, Newcomb and Jensen 1996). Also, because of turbidity, salmonids disperse from established territories, which can temporarily displace fish into less suitable habitats and which can lead to reduced growth rates (Sigler *et al.* 1984).

Much of the research discussed in the paragraph above focused on turbidity levels higher than those expected to occur during implementation of the proposed activities. As described above in the Environmental Baseline, substrate throughout the action area consists of gravel and a mixture of fine sediments (Joel Casagrande, NMFS, personal observation, June 20, 2011). NMFS expects the increase in turbidity to be relatively minor during the proposed activities. Still, the effects of elevated turbidity may extend downstream approximately 1,000 feet, beyond which, much if not all of the suspended material would settle in the stream channel because of very low flows during the installation and removal of the cofferdams.⁵ Observations of turbidity response during removal of dewatering facilities in a Central California Coast watershed (*i.e.*, Uvas Creek, Santa Clara County) where substrate quality was similar and stream flows were substantially

⁵ The slower the water velocity, and smaller the amount of water, the shorter distance a given particle of sediment travels in the water column.

higher indicated a majority of the suspended sediment dropped out in the first 300 to 400 feet from the source (Joel Casagrande, NMFS, personal observation). Based on these observations, NMFS thinks it unlikely that suspended material would travel farther than approximately 1,000 feet given lower flows than Uvas Creek.

Monitoring of newly replaced culverts within Humboldt County indicated temporary increases in turbidity following winter storm events in which the measured turbidity was generally less than the turbidity threshold commonly cited as beginning to cause minor behavioral changes (Humboldt County 2002, 2003, and 2004), and always less than turbidity levels necessary to injure or kill salmonids. Impacts associated with degraded water quality will likely be limited to behavioral effects, such as temporarily vacating preferred habitat or temporarily reduced feeding efficiency. These temporary changes in behavior may slightly reduce growth rates, but are not likely to reduce the survival chances of individual juvenile salmonids. Caltrans has included BMPs to reduce the likelihood of sediments from entering the stream. NMFS's familiarity with the results of similar BMPs indicates these actions will, if implemented appropriately, to be effective at reducing sedimentation rates. Any increases in turbidity due to the construction of cofferdams and during the initial re-wetting of the reconfigured channel will likely be minimal and temporary due the incorporation of BMP's, the low stream flows present during summer, and the adherence to the listed terms and conditions in this biological opinion. Therefore, any short-term impact associated with turbidity during implementation of this project is expected to be insignificant.

D. Habitat Loss

Impacts on riparian and aquatic habitat will occur as a result of the temporary loss of vegetation within the footprint of the proposed retaining wall and the access ramp to the channel. Riparian zones serve important functions in stream ecosystems by providing shade, sediment storage, nutrient inputs, channel and stream bank stability, habitat diversity, and cover and shelter for fish (Murphy and Meehan 1991). Small streams are especially sensitive to loss of riparian habitat and shade, which moderates stream temperatures by insulating the stream from solar radiation and reducing heat exchange with the surrounding air.

To minimize the temporal loss of riparian vegetation and the potential for incremental effects on stream temperatures, Caltrans proposes to limit the amount of vegetation removed to the least amount possible. Existing vegetation will be preserved to the extent possible by pruning or, if necessary, cutting individual plants to within a few inches of the ground to allow natural regeneration to occur following construction. In some cases, entire trees and root systems will have to be removed where they have grown in and around the failed retaining wall. Six trees along more than 130 feet of stream will need to be removed (4 red alders, 1 California bay, and 1 red willow). Most have a diameter at breast height (DBH) less than 10 inches and only two have trunks with a DBH between 10 and 14 inches. Following the construction of the retaining wall and the removal of the access ramp to the channel, all of the disturbed areas will be planted with native vegetation in accordance with a NMFS-approved re-vegetation and monitoring plan. In addition, vegetation plugs will be incorporated into the RSP. Because of the small area affected, the rapid re-growth of willows and alders, and the implementation of a re-vegetation and

monitoring plan, NMFS does not expect the effects of the small number of trees and understory species removed or trimmed along the bank of Pocket Canyon Creek will result in appreciable impacts to listed critical habitat or species.

VII. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Caltrans is not aware of any additional actions that would cause cumulative effects beyond those that are ongoing and have been analyzed in the environmental baseline of this biological opinion (Caltrans 2011). In the long term, global climate change may produce temperature and precipitation changes that may adversely affect listed salmonids in the action area.

VIII. INTEGRATION AND SYNTHESIS

The CCC steelhead DPS is listed as threatened. Throughout the CCC steelhead DPS and the greater Russian River Watershed, stream and estuary habitats have been significantly impacted by multiple anthropogenic activities (*i.e.*, logging, urban development, agriculture, dams, stream channelization, and poor lagoon management). These have contributed to substantial declines in the abundance of CCC steelhead in many of the watersheds in this region (Good *et al.* 2005, Spence *et al.* 2008). Habitat conditions in the action area, based on observations by NMFS staff in early summer 2011, are marginally suitable for juvenile steelhead (Joel Casagrande, NMFS, personal observation, June 2011, B. Cox, personal communication, August 2011). Data on juvenile steelhead abundance during the dry season (July – October) are extremely limited for this drainage and there are no data specific to the action area. However, based on current habitat conditions NMFS expects juvenile steelhead in low densities may be present prior to dewatering the project action area.

During dewatering of the work site, fish rescue and relocation efforts will take place. Only juvenile steelhead are likely to be present at the time of construction. NMFS anticipates up to 35 juvenile steelhead may be adversely affected by the project, and no more than 2 juvenile steelhead will die as a result of the proposed activities. The action area is located in the downstream portion of the watershed and will occupy a very small portion of the total amount of potential rearing habitat available to steelhead. Therefore, a substantial amount of the watershed's rearing habitat, and presumably the steelhead utilizing these areas, will not be affected by the proposed project. The total number of juvenile steelhead relocated from the action area during the proposed project are likely to represent a small proportion of the overall Pocket Canyon Creek population and will represent a fraction of the total Russian River Watershed and CCC steelhead DPS abundance. It is unlikely the small potential loss of two juvenile steelhead as a result of the project will impact future adult returns, due to the relatively large number of juveniles produced by each spawning pair and the larger amount of rearing

habitat located elsewhere in the watershed. Therefore, NMFS does not believe the project will appreciably diminish the abundance, productivity, diversity, or spatial structure of the Lower Russian River population of CCC steelhead.

Short term effects related to turbidity and vegetation removal during the construction and removal of stream flow diversion facilities and channel access ramp are expected to be minor and temporary, and NMFS anticipates the proposed BMPs will control sediment/turbidity sufficiently to avoid significant adverse effects to listed fish species. No permanent adverse changes in stream flow are anticipated. Therefore, NMFS believes the effects of turbidity increases and flow conditions from the project activities will not have any long-term impacts to the PCEs of CCC coho salmon or CCC steelhead critical habitat. The value of critical habitat in the action area for species conservation is not likely to be appreciably reduced by the activities proposed.

IX. CONCLUSION

After reviewing the best available scientific and commercial information, the current status of the species and critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NMFS' biological opinion Caltrans's proposed Pocket Canyon Creek – Highway 116 bank stabilization project, in Sonoma County, California is not likely to jeopardize the continued existence of CCC steelhead.

After reviewing the best available scientific and commercial information, the current status of the critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NMFS' biological opinion Caltrans' proposed Pocket Canyon Creek – Highway 116 bank stabilization project, in Sonoma County, California is not likely result in the destruction or adverse modification of designated critical habitat designated for CCC coho salmon and CCC steelhead.

X. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by Caltrans, for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans, or its contractors (1) fails to assume and implement the terms and conditions or (2) fails to require its designees to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

As described above in the accompanying biological opinion, the number of threatened CCC steelhead that may be incidentally taken by capture and relocation during project activities is expected to be no more than 35 individuals. NMFS anticipates no more than two juvenile steelhead present in the area will be killed during capture and relocation and channel dewatering activities.

The anticipated take will have been exceeded if more than 35 juvenile steelhead are captured or if more than 2 juvenile steelhead are killed during relocation efforts.

B. Effect of the Take

In the accompanying opinion, NMFS determined this level of anticipated take is not likely to result in jeopardy to CCC steelhead.

C. Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the impacts of the incidental take of CCC steelhead:

1. Undertake measures to ensure harm and mortality to CCC steelhead resulting from fish relocation is low;
2. Undertake measures to maintain water quality conditions and riparian habitat conditions at pre-construction levels to avoid or minimize harm to CCC steelhead;
3. Prepare and submit plans and reports that describe specific methods and practices prior to their implementation (plans) and document (reports) the effects of the project. Notify NMFS when project activities are scheduled to begin.

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Caltrans, and their designees/contractors must comply with the following terms and conditions, which implement

the reasonable and prudent measures described above, and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. The following terms and conditions implement Reasonable and Prudent Measure 1.
 - a. Caltrans will provide a list of all BMPs and the Terms and Conditions of this biological opinion to their contractors and ensure they are followed for the length of the project.
 - b. The applicant and its contractors will follow NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act (NMFS 2000). All live steelhead will be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish will be kept in cool, shaded, and aerated water that is protected from excessive noise, jostling, or overcrowding any time they are not in the stream, and fish will not be removed from this water except when released. If necessary, the biologist will have at least two containers and segregate young-of-year salmonids from older salmonids and other potential aquatic predators in order to avoid predation affects. Captured salmonids will be relocated as soon as possible and will be given highest priority over other non-listed fish species. Juvenile steelhead will be released upstream of the project construction area.
 - c. The biologist will note the number of each species collected/observed in the affected area, the number of fish relocated, and the date and time of collection and relocation. If any dead or fatally wounded fish are observed, they will be collected and placed in an appropriately sized whirl-pack or zip-lock bag, labeled with the date and time of collection, fork length, and location of capture, and frozen as soon as possible. If any fish are fatally wounded, Caltrans will then notify the NMFS biologist, listed below, no later than two days from the occurrence for further instruction on disposition of the dead steelhead.
2. The following terms and conditions implement Reasonable and Prudent Measure 2.
 - d. Caltrans, or its contractors, shall monitor in-channel activities and performance of sediment control or detention devices for the purpose of identifying and reconciling any condition that could result in take of listed salmonids. More specifically, Caltrans, or its contractors, will measure turbidity throughout the construction and removal of creek diversion facilities and for one day following both the construction and removal of the diversion facilities using either a turbidity meter or a transparency tube. The results of this monitoring will be used to confirm NMFS' assumption that increases in turbidity levels within and downstream of the action area will be temporary (*i.e.*, increases in turbidity from the construction and removal of the flow diversion facilities will be limited to one day or less).
 - e. Caltrans, or its contractor, shall allow any NMFS employee(s) or any other person(s) designated by NMFS, to access the work area during the construction period for the purpose of observing monitoring activities, evaluating fish and stream conditions,

monitoring performance of BMPs, monitoring water quality, collecting fish samples, or perform other monitoring/studies. NMFS will notify the Caltrans Resident Engineer 48 hours prior to planning a site visit and will contact Caltrans personnel prior to entering the construction site.

3. The following terms and conditions implement Reasonable and Prudent Measure 3.

- f. Caltrans will provide NMFS with a final Fish Capture and Relocation Plan for review prior to the start of fish collection and relocation activities. The plan must be submitted no less than 30 days prior to the beginning of fish capture and relocation activities (*i.e.*, on or before May 15 of the year to be implemented if beginning on June 15). The plan will outline all confirmed fish relocation methods, including the location and a description of the habitat where steelhead are to be relocated. The plan will be submitted to NMFS' North Central Coast Office (see address below).
- g. As discussed above in the Project Description, Caltrans has proposed to submit a final re-vegetation plan to NMFS for approval no less than 60 days prior to project commencement. This plan shall include the general methods, estimated number of each tree and shrub species removed as a result of the project as well as the number to be planted. In addition, the plan shall outline survivorship and success monitoring including photo documentation. The plan shall be submitted to the NMFS address below.
- h. The project biologist will notify NMFS biologist Joel Casagrande at (707) 575-6016 or Joel.Casagrande@noaa.gov no later than one week prior to relocation activities in order to provide an opportunity for NMFS staff to observe the activities.
- i. Caltrans shall provide NMFS with a summary report by January 15 of the year following the completion of fish capture and relocation efforts. The report shall include the methods used during the fish capture and relocation, the location, number and species captured, number of mortalities by species, and other pertinent information (*i.e.*, water temperature) related to the fish capture and relocation activities. Reports shall be submitted to NMFS North Central Coast Office (see address below).
- j. Caltrans shall provide NMFS with a summary turbidity monitoring report by January 15 of the year following the completion of the project (removal of dewatering facilities). The report will include turbidity monitoring data collected throughout the construction and removal of the dewatering facilities as described above. The report shall be submitted to NMFS North Central Coast Office (see address below).
- k. A final report describing the re-vegetation activities and survivorship monitoring shall be submitted to NMFS at the address below on January 15th of the year following the end of the post monitoring period.

1. All reports required for the above terms and conditions shall be sent to the NMFS North Central Coast Office, Attention: Supervisor of Protected Resources Division, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404

XI. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, or to develop information.

Caltrans, in coordination with NMFS, should identify and prioritize any maintenance and construction projects which, if implemented, can improve ESA-listed salmonid migration or in-stream environmental conditions throughout the North-Central California Coast Recovery Domain.

XII. REINITIATION NOTICE

This concludes formal consultation on Caltrans for the proposed Pocket Canyon Creek – Highway 116 bank stabilization project in Sonoma County, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

XIII. LITERATURE CITED

- Acomb, D. 2006. Memo to the file regarding Pocket Canyon Creek surveys dated April 6, 2006. 1 page.
- Barnhart, R.A. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest) -- steelhead. U.S. Fish and Wildlife Service Biological Report 82(11.60). U.S. Army Corps of Engineers, TR EL-82-4. 21 pp.
- Bell, M.C. 1973. Fisheries handbook of engineering requirements and biological criteria. State Water Resources Control Board, Fisheries Engineering Research Program, Portland, Oregon. Contract No. DACW57-68-C-006.

- Bilby, R.E., B.R. Fransen, and P.A. Bisson. 1996. Incorporation of nitrogen and carbon from spawning coho salmon into the trophic system of small streams: evidence from stable isotopes. *Canadian Journal of Fisheries and Aquatic Sciences* 53:164-173.
- Bilby, R.E., B.R. Fransen, P.A. Bisson, and J.K. Walter. 1998. Response of juvenile coho salmon (*Onchorynchus kisutch*) and steelhead (*Onchorynchus mykiss*) to the addition of salmon carcasses to two streams in southwestern Washington, USA. *Canadian Journal of Fisheries and Aquatic Sciences* 55:1909-1918.
- Bjorkstedt, E.P., B.C. Spence, J.C. Garza, D.G. Hankin, D. Fuller, W.E. Jones, J.J. Smith, and R. Macedo. 2005. An analysis of historical population structure for evolutionarily significant units of Chinook salmon, coho salmon, and steelhead in the north-central California coast recovery domain. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center. 210 pages.
- Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 in W.R. Meehan, editor. *Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats*. American Fisheries Society Special Publication 19. American Fisheries Society. Bethesda, Maryland. 751 pages.
- Bond, M.H. 2006. The importance of estuary rearing to Central California steelhead (*Oncorhynchus mykiss*) growth and marine survival. Master's thesis. University of California, Santa Cruz.
- Brewer, P.G. and J. Barry. 2008. Rising Acidity in the Ocean: The Other CO₂ Problem. *Scientific American*. October 7, 2008.
- Busby, P. J., T. C. Wainwright, G. J. Bryant, L. J. Lierheimer, R. S. Waples, F. W. Waknitz, and I. V. Lagomarsino. 1996. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. National Marine Fisheries Service, August 1996.
- CDFG (California Department of Fish and Game). 2005. Report to the National Marine Fisheries Service for Fisheries Restoration Grant Program Projects conducted under Department of the Army Regional General Permit No. 12 (Corps File No. 27922N) within the United States Army Corps of Engineers, San Francisco District, January 1, 2004 through December 31, 2004. March 1.
- CDFG (California Department of Fish and Game). 2006a. Stream inventory report: Mays Canyon Creek. 9 pp.
- CDFG (California Department of Fish and Game). 2006b. Annual report to the National Marine Fisheries Service for Fisheries Restoration Grant Program Projects conducted under Department of Army Regional General Permit No. 12 (Corps File No. 27922N) within the U.S. Army Corps of Engineers, San Francisco District, January 1, 2005 through December

31, 2005. CDFG Region 1, Fortuna Office. March 1.

CDFG (California Department of Fish and Game). 2007. Annual report to the National Marine Fisheries Service for Fisheries Restoration Grant Program Projects conducted under Department of Army Regional General Permit No. 12 (Corps File No. 27922N) within the U.S. Army Corps of Engineers, San Francisco District, January 1, 2006 through December 31, 2006. Northern Region, Fortuna Office. March 1.

CDFG (California Department of Fish and Game). 2008. Annual report to the National Marine Fisheries Service for Fisheries Restoration Grant Program Projects conducted under Department of Army Regional General Permit No. 12 (Corps File No. 27922N) within the U.S. Army Corps of Engineers, San Francisco District, January 1, 2007 through December 31, 2007. Northern Region, Fortuna Office. March 1.

CDFG (California Department of Fish and Game). 2009. Annual report to the National Marine Fisheries Service for Fisheries Restoration Grant Program Projects conducted under Department of Army Regional General Permit No. 12 (Corps File No. 27922N) within the U.S. Army Corps of Engineers, San Francisco District, January 1, 2008 through December 31, 2008. Northern Region, Fortuna Office. March 1.

CDFG (California Department of Fish and Game). 2010. Annual report to the National Marine Fisheries Service for Fisheries Restoration Grant Program Projects conducted under Department of Army Regional General Permit No. 12 (Corps File No. 27922N) within the U.S. Army Corps of Engineers, San Francisco District, January 1, 2009 through December 31, 2009. Northern Region, Fortuna Office. March 1.

Caltrans (California Department of Transportation). 2011. Biological Assessment: Pocket Canyon Creek, Sonoma County. July 2011. 54 pages + appendices.

Collins, B.W. 2004. Report to the National Marine Fisheries Service for instream fish relocation activities associated with fisheries habitat restoration program projects conducted under Department of the Army (Permit No. 22323N) within the United States Army Corps of Engineers, San Francisco District, during 2002 and 2003. California Department of Fish and Game, Northern California and North Coast Region. March 24, 2004. Fortuna, California.

CCWI (Community Clean Water Institute). 2004. Pocket Canyon Creek Water Quality Results 2004. 8 pp.

Cox, B. 2000. Main streams in Sonoma County. CDFG. March 1, 2000. 5 pp.

Cox, P., and D. Stephenson. 2007. A changing climate for prediction. *Science* 113:207-208.

Cushman, R.M. 1985. Review of ecological effects of rapidly varying flows downstream from hydroelectric facilities. *North American Journal of Fisheries Management*. 5:330-339.

- Everest, F.H., and D.W. Chapman. 1972. Habitat selection and spatial interaction by juvenile Chinook salmon and steelhead trout. *Journal of the Fisheries Research Board of Canada* 29:91-100.
- Feely, R.A., C.L. Sabine, K. Lee, W. Berelson, J. Kleypas, V.J. Fabry, and F.J. Millero. 2004. Impact of anthropogenic CO₂ on the CaCO₃ system in the oceans. *Science* 305, 362-366.
- Good, T.P., R.S. Waples, and P. Adams, *editors*. 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. NOAA Technical Memorandum NMFS-NWFSC-66. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington. June, 2005.
- Gresh, T., J. Lichatowich, and P. Schoonmaker. 2000. An estimation of historic and current levels of salmon production in the northeast pacific ecosystem. *Fisheries* 15(1):15-21.
- Hanson, L.C. 1993. The foraging ecology of Harbor Seals, *Phoca vitulina*, and California Sea Lions, *Zalophus californianus*, at the mouth of the Russian River, California. Master of Science thesis. Sonoma State University, Rohnert Park, California.
- Harvey, B. C. 1986. Effects of suction gold dredging on fish and invertebrates in two California streams. *North American Journal of Fisheries Management* 6:401-409.
- Hayes, D.B., C.P. Ferreri, and W.W. Taylor. 1996. Active fish capture methods. Pages 193-220 in B.R. Murphy and D.W. Willis, editors. *Fisheries Techniques*, 2nd edition. American Fisheries Society, Bethesda, Maryland. 732 pages.
- Hayhoe, K., D. Cayan, C. B. Field, P. C. Frumhoff, E. P. Maurer, N. L. Miller, S. C. Moser, S. H. Schneider, K. N. Cahill, E. E. Cleland, L. Dale, R. Drapek, R. M. Hanemann, L. S. Kalkstein, J. Lenihan, C. K. Lunch, R. P. Neilson, S. C. Sheridan, and J. H. Verville. 2004. Emissions pathways, climate change, and impacts on California. *Proceedings of the National Academy of Sciences of the United States of America*, volume 101: 12422-12427.
- Hokanson, K. E. F., C. F. Kleiner, and T. W. Thorslund. 1977. Effects of constant temperatures and diel temperature fluctuations on specific growth and mortality rates of juvenile rainbow trout, *Salmo gairdneri*. *Journal of the Fisheries Research Board of Canada* 34:639-648.
- Hubert, W.A. 1996. Passive capture techniques. Pages 157-192 in B.R. Murphy and D.W. Willis, editors. *Fisheries Techniques*, 2nd edition. American Fisheries Society. Bethesda, Maryland. 732 pages.

- Humboldt County. 2002. Memo from Ann Glubczynski, County of Humboldt Public Works, to Margaret Tauzer, National Marine Fisheries Service, titled "2002 Monitoring Report – Five Fish Passage Enhancement Projects". June 27, 2002. 1 page.
- Humboldt County. 2003. Memo from Ann Glubczynski, County of Humboldt Public Works, to Margaret Tauzer, National Marine Fisheries Service, titled "2003 Monitoring Report – Eleven Culvert Replacements for Fish". June 23, 2003. 2 pages.
- Humboldt County. 2004. Memo from Ann Glubczynski, County of Humboldt Public Works, to Margaret Tauzer, National Marine Fisheries Service, titled "2002 Monitoring Report – Eleven Culvert Replacements for Fish Passage". June 10, 2004. 2 pages.
- Keeley, E.R. 2003. An experimental analysis of self-thinning in juvenile steelhead trout. *Oikos* 102:543-550.
- Lindley, S. T., R. S. Schick, E. Mora, P. B. Adams, J. J. Anderson, S. Greene, C. Hanson, B. P. May, D. R. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2007. Framework for assessing viability of threatened and endangered Chinook salmon and steelhead in the Sacramento-San Joaquin Basin. *San Francisco Estuary and Watershed Science*, 5.
- Lindley, S. T., C. B. Grimes, M. S. Mohr, W. Peterson, J. Stein, J. T. Anderson, L.W. Botsford, D. L. Bottom, C. A. Busack, T. K. Collier, J. Ferguson, J. C. Garza, A. M. Grover, D. G. Hankin, R. G. Kope, P. W. Lawson, A. Low, R. B. MacFarlane, K. Moore, M. Palmer-Zwahlen, F. B. Schwing, J. Smith, C. Tracy, R. Webb, B. K. Wells, and T. H. Williams. 2009. What caused the Sacramento River fall Chinook stock collapse? Pre-publication report to the Pacific Fishery Management Council. March 18, 2009, 57 pp.
- Luers, A.L., Cayan, D.R., and G. Franco. 2006. Our Changing Climate, Assessing the Risks to California. A summary report from the California Climate Change Center. 16 pages.
- Meehan, W.R. and T.C. Bjornn, 1991. Salmonid distributions and life histories. In: W.R. Meehan, ed.; Influences of forest and rangeland management on salmonid fishes and their habitats. *Amer. Fish. Soc. Special Publication* 19.
- McElhany, P., M. H. Ruckelshaus, M. J. Ford, T. C. Wainwright, and E. P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Depart. Commer., NOAA Technical Memorandum NMFS-NWFSC-42.
- McEwan, D.R. 2001. Central Valley steelhead. *California Department of Fish and Game, Fish Bulletin* 179(1):1-44.
- Moyle, P.B. 2002. *Inland Fishes of California*. University of California Press, Berkeley, California.

- Murphy, M. L., and W. R. Meehan. 1991. Stream Ecosystems. Pages 17–46 in W. R. Meehan (ed.), Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats, American Fisheries Society, Bethesda, MD, Special Publication 19.
- Myrick, C. A., and J. J. Cech. 2005. Effects of temperature on the growth, food consumption, and thermal tolerance of age-0 Nimbus-strain steelhead. *North American Journal of Aquaculture* 67:324–330.
- NMFS (National Marine Fisheries Service). 1997. Status review update for deferred and candidate ESUs of West Coast Steelhead (Lower Columbia River, Upper Willamette River, Oregon Coast, Klamath Mountains Province, Northern California, Central Valley, and Middle Columbia River ESUs). United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 62 pages.
- NMFS (National Marine Fisheries Service). 1999. Impacts of California sea lions and Pacific harbor seals on salmonids and West Coast ecosystems. Report to Congress. Available from National Marine Fisheries Service, Protected Resources Division, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404.
- NMFS (National Marine Fisheries Service). 2000. NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act, June 2000. Available at: <http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf>
- Newcombe, C. P., and J. O. T. Jensen. 1996. Channel suspended sediment and fisheries: A synthesis for quantitative assessment of risk and impact, *North American Journal of Fisheries Management* 16:693-727.
- Osgood, K. E. (editor). 2008. Climate Impacts on U.S. Living Marine Resources: National Marine Fisheries Service Concerns, Activities and Needs. U.S. Dep. Commerce, NOAA Tech. Memo. NMFSF/ SPO-89, 118 p.
- Scavia, D., J.C. Field, D.F. Boesch, R.W. Buddemeier, V. Burkett, D.R. Cayan, M. Fogarty, M.A. Harwell, R.W. Howarth, C. Mason, D.J. Reed, T.C. Royer, A.H. Sallenger, and J.G. Titus. 2002. Climate Change Impacts on U.S. Coastal and Marine Ecosystems. *Estuaries*, volume 25(2): 149-164.
- Schneider, S.H. 2007. The unique risks to California from human-induced climate change. California State Motor Vehicle Pollution Control Standards; Request for Waiver of Federal Preemption, presentation May 22, 2007.
- Shapovalov, L. and A.C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*). CDFG, Fish. Bull. No.98.

- Sigler, J. W., T. C. Bjornn, and F.H. Everest. 1984. Effects of chronic turbidity on density and growth of steelheads and coho salmon. *Transactions of the American Fisheries Society* 113:142-150.
- Smith, J.J. 1990. The effects of sandbar formation and inflows on aquatic habitat and fish utilization in Pescadero, San Gregorio, Waddell and Pomponio Creek estuary/lagoon systems, 1985-1989. Department of Biological Sciences, San Jose State University, San Jose, California. December 21, 1990.
- Smith, J. J., and H. W. Li. 1983. Energetic factors influencing foraging tactics of juvenile steelhead trout *Salmo gairdneri*. Pages 173-180 in D. L. G. Noakes, D. G. Lindquist, G. Helfman, and J. Ward, editors. *Predators and Prey in Fishes*. Dr. W. Junk Publishers, The Hague, Netherlands.
- Smith, D.M., Cusack, S., Colman, A.W., Folland, C.K., Harris, G.R., and Murphy, J.M. 2007. Improved surface temperature prediction for the coming decade from a global climate model. *Science* 317:796-799.
- Spence, B., G., E. P. Bjorkstedt, J. C. Garza, J. J. Smith, D. G. Hankin, D. Fuller, W. E. Jones, R. Macedo, T. H. Williams, and E. Mora. 2008. A framework for assessing the viability of threatened and endangered salmon and steelhead in the North-Central California Coast Recovery Domain. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center. 194 pp.
- Thomas, V.G. 1985. Experimentally determined impacts of a small, suction gold dredge on a Montana stream. *North American Journal of Fisheries Management* 5:480- 488.
- Turley, C. 2008. Impacts of changing ocean chemistry in a high-CO₂ world. *Mineralogical Magazine*, February 2008, 72(1). 359-362.
- Waples, R.S. 1991. Genetic interactions between hatchery and wild salmonids: lessons from the Pacific Northwest. *Canadian Journal of Fisheries and Aquatic Sciences* 48 (supplement 1):124-133.
- Wurtsbaugh, W. A. and G. E. Davis. 1977. Effects of temperature and ration level on the growth and food conversion efficiency of *Salmo gairdneri*, Richardson. *Journal of Fish Biology* 11:87-98.

XIV. FEDERAL REGISTERS CITED

- 61 FR 56138: Endangered and Threatened Species; Threatened Status for Central California Coast Coho Salmon Evolutionarily Significant Unit (ESU). National Marine Fisheries Service, National Oceanic and Atmospheric Administration, United States Department of

Commerce. Final Rule. Federal Register, Volume 61, No. 212, October 31, 1996. Pages 56138-56149.

64 FR 24049. May 5, 1999. Designation of ESA critical habitat for central California coast and southern Oregon/northern California coast coho. National Marine Fisheries Service. National Oceanic and Atmospheric Administration, United States Department of Commerce. Federal Register, Volume 64 Pages 24049-24062.

70 FR 52488. September 2, 2005. Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, United States Department of Commerce. Federal Register, Volume 70 Pages 52488-52627.

71 FR 834. January 5, 2006. Final ESA listing determinations for 10 distinct population segments of West Coast steelhead. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, United States Department of Commerce. Federal Register, Volume 71 Pages 834-862.

XV. PERSONAL COMMUNICATIONS AND OBSERVATIONS

Joel Casagrande. 2011. Personal Observation. NMFS, Santa Rosa, CA.

Jeffrey Jahn. 2011. Personal Communication. NMFS, Santa Rosa, CA.

Bill Cox. 2011. Personal Communication. CDFG (retired).



DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET, 16TH FLOOR
SAN FRANCISCO, CALIFORNIA 94103-1398

REPLY TO
ATTENTION OF

Regulatory Division

APR 18 2013

SUBJECT: File Number SPN-2013-00019N

Mr. Jeffery Jensen
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Dear Mr. Jensen:

This correspondence is in reference to your submittal of November 15, 2012, concerning Department of the Army (DA) authorization to repair a failed slope near Pocket Canyon Creek located along State Route (SR) 116 at post mile 13.7 east of the town of Guerneville, Sonoma County, California (38.49804, -122.97099).

The purpose of the project is to remove and replace the existing failed retaining wall along Pocket Canyon Creek, stabilize the slope adjacent to the failed retaining wall, repair the existing drainage in the area, and repair the depression in the roadway. Work with U.S. Army Corps of Engineers jurisdiction will include installation of a 130-foot long soldier pile retaining wall, installation of rock slope protection at the foot of the wall, and in-kind replacement of a 36" diameter culvert. Work will require temporary dewatering of Pocket Canyon Creek. Work will result in the permanent fill of 0.0066 acre (130 linear feet) of Other Waters of the U.S. Work will also result temporary impact 0.099 acre (175 linear feet) Other Waters of the U.S. associated with de-watering of the creek. All work shall be completed in accordance with the plans and drawings titled "*USACE File #2013-00019N, Pocket Canyon Creek SR 116 PM 13.7, Figures 1 to 12*" provided as enclosure 1.

Section 404 of the Clean Water Act (CWA) generally regulates the discharge of dredged or fill material below the plane of ordinary high water in non-tidal waters of the United States, below the high tide line in tidal waters of the United States, and within the lateral extent of wetlands adjacent to these waters. Section 10 of the Rivers and Harbors Act generally regulates construction of structures and work, including excavation, dredging, and discharges of dredged or fill material, occurring below the plane of mean high water in tidal waters of the United States; in former diked baylands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary high water in non-tidal waters designated as navigable waters of the United States. Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide; and/or all waters presently used, or have been used in the past, or may be susceptible for future

use to transport interstate or foreign commerce. A Preliminary JD has been completed for your site. Preliminary JDs are written indications that there may be waters of the U.S. on a parcel or indications of the approximate location(s) of waters of the U.S. on a parcel. Preliminary JDs are advisory in nature and may not be appealed.

Based on a review of the information in your submittal, the project qualifies for authorization under Department of the Army Nationwide Permit(s) (NWP) 13 for Bank Stabilization and 14 for Linear Transportation Projects, 77 Fed. Reg. 10,184, February 21, 2012, pursuant to 404 of the CWA of 1972, as amended (33 U.S.C. § 1344 *et seq.*). The project must be in compliance with the terms of the NWP, the general conditions of the Nationwide Permit Program, and the San Francisco District regional conditions cited in enclosure 2. You must also be in compliance with any special conditions specified in this letter for the NWP authorization to remain valid. Non-compliance with any term or condition could result in the revocation of the NWP authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This NWP authorization does not obviate the need to obtain other State or local approvals required by law.

This verification will remain valid until March 18, 2017, unless the NWP authorization is modified, suspended, or revoked. Activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon a NWP will remain authorized provided the activity is completed within 12 months of the date of a NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 C.F.R. § 330.4(e) and 33 C.F.R. §§ 330.5 (c) or (d). This verification will remain valid if, during the time period between now and March 18, 2017, the activity complies with any subsequent modification of the NWP authorization. The Chief of Engineers will periodically review NWPs and their conditions and will decide to either modify, reissue, or revoke the permits. If a NWP is not modified or reissued within five years of its effective date, it automatically expires and becomes null and void. It is incumbent upon you to remain informed of any changes to the NWPs. Changes to the NWPs would be announced by Public Notice posted on our website (<http://www.spn.usace.army.mil/Missions/Regulatory.aspx>). Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 3, verifying that you have complied with the terms and conditions of the permit.

This authorization will not be effective until you have obtained a Section 401 water quality certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB). If the RWQCB fails to act on a valid request for certification within two months after receipt of a complete application, the Corps will presume a waiver of water quality certification has been obtained. You shall submit a copy of the certification to the Corps prior to the commencement of work.

General Condition 18 stipulates that project authorization under a NWP does not allow for the incidental take of any federally-listed species in the absence of a biological opinion (BO) with incidental take provisions. As the principal federal lead agency for this project, Caltrans initiated consultation with the United States Fish and Wildlife Service (USFWS) and /or National Marine Fisheries Service (NMFS) to address project related impacts to list species, pursuant to Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*) and the Essential Fish Habitat (EFH) for various life stages of fish species managed with the Pacific Groundfish Fishery Management Plan, Coastal Pelagics Fishery Management Plan, and Pacific Coast Salmon Fishery Management Plan, pursuant to Magnuson-Stevens Fishery Conservation and Management Act of 1996, as amended (16 U.S.C. § 1801 *et seq.*).

In order to ensure compliance with this NWP authorization, the following special conditions shall be implemented:

1. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, if temporary structures, work, and discharges, including cofferdams, are required.
2. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows.
3. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations.
4. No material is of a type, or is placed in any location, or in any manner, that will impair surface water flow into or out of any waters of the United States.
5. No material is placed in a manner that will be eroded by normal or expected high flows.
6. After construction completion, any installed by-pass pipe, cofferdam, or other related construction materials installed below ordinary high water shall be removed in its entirety. Excavated substrate consisting of coarse sand, gravel, and cobble may be used as backfill material for construction purposes; all other material excavated below ordinary high water, including debris, mud, silt, and organic matter, shall be hauled off-site and disposed of at an upland location not subject to Corps' regulatory authority.
7. To remain exempt from the prohibitions of Section 9 of the Endangered Species Act, the non-discretionary Terms and Conditions for incidental take of federally-listed California red-legged frog shall be fully implemented as stipulated in the Biological Opinion entitled, "Biological Opinion for the Proposed State Route 116 et Canyon Creek

Retaining Wall Replacement Project, Sonoma County, California (EA 04-1G420)” (pages 1-33) dated February 21, 2012 (enclosure 4). Project authorization under the NWP is conditional upon compliance with the mandatory terms and conditions associated with incidental take. Failure to comply with the terms and conditions for incidental take, where an ‘incidental take’ of a federally-listed species occurs, would constitute an unauthorized take and non-compliance with the NWP authorization for your project. The USFWS is, however, the authoritative federal agency for determining compliance with the incidental take statement and for initiating appropriate enforcement actions or penalties under the Endangered Species Act.

8. The USFWS concurred with the determination that the project was not likely to adversely affect California freshwater shrimp, marbled murrelet, and northern spotted owl and designated critical habitat for this species. This concurrence was premised, in part, on project work restrictions outlined in enclosure 4. These work restrictions are incorporated as special conditions to the NWP authorization for your project to ensure unauthorized incidental take of species and loss of critical habitat does not occur.
9. To remain exempt from the prohibitions of Section 9 of the Endangered Species Act, the non-discretionary Terms and Conditions for incidental take of federally-listed Central California Coast steelhead shall be fully implemented as stipulated in the Biological Opinion entitled, “California Department of Transportation, Pocket Canyon Creek-Highway 116 Bank Stabilization Project, Sonoma County, California” (pages 1-29) dated December 21, 2011 (enclosure 5). Project authorization under the NWP is conditional upon compliance with the mandatory terms and conditions associated with incidental take. Failure to comply with the terms and conditions for incidental take, where an ‘incidental take’ of a federally-listed species occurs, would constitute an unauthorized take and non-compliance with the NWP authorization for your project. The NMFS is, however, the authoritative federal agency for determining compliance with the incidental take statement and for initiating appropriate enforcement actions or penalties under the Endangered Species Act.
10. A post construction report shall be submitted 45 days after the conclusion of construction activities. The report shall document construction activities and contain as-built drawings (if different from drawings submitted with application) and include before and after photographs.
11. On-site re-vegetation of the project area as outlined in the “*USACE File #2013-00019N, Pocket Canyon Creek, SR 116 PM 13.7, Figures 10 to 12*” shall be implemented post-construction. A report shall be submitted 45 days after re-vegetation has occurred. The report shall document re-vegetation activities and include post-planting photographs.

You may refer any questions on this matter to Paula Gill of my Regulatory staff by telephone at 415-503-6776 or by e-mail at Paula.C.Gill@usace.army.mil. All correspondence should be addressed to the Regulatory Division, referencing the file number at the head of this letter.

The San Francisco District is committed to improving service to our customers. My Regulatory staff seeks to achieve the goals of the Regulatory Program in an efficient and cooperative manner, while preserving and protecting our nation's aquatic resources. If you would like to provide comments on our Regulatory Program, please complete the Customer Service Survey Form available on our website: <http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,



 Jane M. Hicks
Chief, Regulatory Division

Enclosures

Copies Furnished (w/o enclosures):

CA RWQCB, Oakland, CA
U.S. EPA, San Francisco, CA
CA SWRCB, Sacramento, CA
CDFW, Yountville, Ca
USFWS, Sacramento, Ca
NMFS, Santa Rosa, Ca

North Coast Regional Water Quality Control Board

May 21, 2013

In the Matter of

Water Quality Certification

for the

**California Department of Transportation
State Route 116 – Pocket Canyon Creek Project
WDID No. 1B13011WNSO**

APPLICANT: California Department of Transportation
RECEIVING WATER: Lower Russian River
HYDROLOGIC AREA: Russian River Hydrologic Unit, HU 114
COUNTY: Sonoma
FILE NAME: CDOT - HWY 116, Pocket Canyon Creek Project
WDID No. 1B13011WNSO

BY THE EXECUTIVE OFFICER:

1. On January 17, 2013, the North Coast Regional Water Quality Control Board (Regional Water Board) received an application from the California Department of Transportation (Caltrans), requesting Federal Clean Water Act, section 401, Water Quality Certification (Certification) for activities related to the proposed State Route (SR) 116 – Pocket Canyon Creek Project (Project). The proposed Project would cause disturbances to waters of the United States (U.S.) associated with the Lower Russian River Hydrologic Sub-Area of the Russian River Hydrologic Unit (HU114.11). The Regional Water Board provided public notice of the application pursuant to title 23, California Code of Regulations, section 3858, on April 25, 2013, and posted information describing the Project on the Regional Water Board’s website. No comments were received.
2. The proposed project is located on SR 116 at post mile 13.7, in Sonoma County. The purpose of the Project is to prevent the shoulder of SR 116 from collapsing into Pocket Canyon Creek. The shoulder is unstable due to undermining of the existing retaining wall. The scope of work includes:

DAVID M. NOREN, CHAIR | MATTHIAS ST. JOHN, EXECUTIVE OFFICER

5550 Skylane Blvd., Suite A, Santa Rosa, CA 95403 | www.waterboards.ca.gov/northcoast

- Installing a coffer dam and culvert pipe system to dewater a section of Pocket Canyon Creek;
 - Replacing the failed retaining wall with a soldier pile wall;
 - Placing rock slope protection with willow plantings at the base of the wall to prevent erosion and enhance and protect habitat;
 - Installing a diversion on an unnamed tributary to replace an existing culvert with a culvert in kind; and
 - Repairing the road surface.
3. The proposed Project would result in approximately 0.066 acres of permanent and approximately 0.108 acres of temporary impacts to jurisdictional waters. Ten riparian trees would also be permanently impacted. Caltrans would offset the permanent impacts to riparian habitat with both on-site revegetation and purchase of off-site riparian habitat credits at the East Austin Creek Mitigation Bank.
 4. Caltrans would restore impacted areas to pre-construction condition following completion of the construction activities to offset temporary impacts to waters.
 5. The Project would result in no increase of impervious surface and post-construction storm water treatment is not required for the Project.
 6. The proposed Project would be conducted in the summer and fall of 2014 (estimated duration 97 days). Any work performed within State waters outside of this work window shall first be subject to the acceptance of Regional Water Board staff.
 7. The Project would result in less than one acre disturbed soil area. Caltrans shall utilize Best Management Practices (BMPs) to provide erosion and sediment controls and pollution prevention throughout the Project area during construction. All graded areas within the Project affected by the construction activities shall be appropriately stabilized and/or replanted with appropriate native vegetation.
 8. Caltrans has applied to the U.S. Army Corps of Engineers to perform the Project under Reporting Nationwide Permit No. 14 (*linear transportation projects*) pursuant to Clean Water Act, section 404. Caltrans has applied for a California Department of Fish and Wildlife 1602 streambed alteration agreement. Caltrans has also requested a biological assessment and opinion from U.S. Fish and Wildlife Service and U.S. National Marine Fisheries Service regarding potential impacts to threatened and endangered species within the Project site.
 9. On March 2 2012, Caltrans, acting as lead agency, certified a Mitigated Negative Declaration for the proposed Project in order to comply with California Environmental Quality Act (State Clearing House No. 2012012036). The Regional Water Board has considered the environmental documentation, including any proposed changes, and has incorporated any avoidance, minimization, and mitigation measures into the Project as a condition of approval to avoid significant effects to the environment.
 10. Pocket Canyon Creek is within the Lower Russian River Hydrologic Unit Area and watershed. Pocket Canyon Creek drains to the Lower Russian River which is listed on the Clean Water Act section 303(d) list as impaired for sediment and temperature. Roads are a significant source of sediment in the watershed (directly, from surface erosion, and, indirectly, by destabilizing hillsides).

11. The federal antidegradation policy requires that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Resources Control Board (State Water Board) established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. This Certification is consistent with applicable federal and State antidegradation policies, as it does not authorize the discharge of increased concentrations of pollutants or increased volumes of treated wastewater, and does not otherwise authorize degradation of the waters affected by this Project.
12. Requirements to avoid, minimize, and mitigate sediment impacts are incorporated as enforceable conditions in this Certification to ensure compliance with Basin Plan Water Quality Objectives and to protect State waters. Storm water runoff monitoring, sampling, and analysis will be conducted as required by the State Water Board National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from the State of California, Department of Transportation Properties, Facilities and Activities Order No. 99 - 06 - DWQ. The surface water data collected will be utilized to assess the adequacy of BMPs during construction as well as site specific mitigation measures proposed to minimize impacts to the environment, including sediment and temperature impacts.
13. This discharge is also regulated under State Water Board Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification," which requires compliance with all conditions of this certification.

Receiving Waters: Pocket Canyon Creek
Lower Russian River Hydrologic Sub-Area 114.11

Filled and/or
Excavated Areas: Permanent - Streams (Waters of U.S.): 0.066 acres
Temporary - Streams (Waters of U.S.): 0.108 acres

Total Linear Impacts: Permanent - Streams (Waters of U.S.): 60 Linear ft.
Temporary - Streams (Waters of U.S.): 440 Linear ft.

Dredge Volume : None

Fill Volume : 262 cubic yards

Latitude/Longitude: 38.497853N / 122.970378 W

Accordingly, based on its independent review of the record, the Regional Water Board certifies that the Caltrans - State Route 116 - Pocket Canyon Creek Project (WDID No. 1B13011WNSO), as described in the Project application will comply with sections 301, 302, 303, 306 and 307 of the Clean Water Act, and with applicable provisions of state law, provided that the Caltrans complies with the following terms and conditions:

All conditions of this Order apply to Caltrans (and all its employees) and all contractors (and their employees), sub-contractors (and their employees), and any other entity or agency that performs activities or work on the Project (including the off-site mitigation lands) as related to this Water Quality Certification.

1. This certification action is subject to modification or revocation upon administrative or judicial review; including review and amendment pursuant to Water Code section 13330 and title 23, California Code of Regulations, section 3867.
2. This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to title 23, California Code of Regulations, section 3855, subdivision (b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity this certification is conditioned upon total payment of any fee required under title 23, California Code of Regulations, section 3833, and owed by the applicant. \$1610 was submitted by Caltrans on January 17, 2013.
4. Caltrans shall provide a copy of this order and State Water Board Order No. 2003-0017-DWQ (web link referenced below) to the contractor and all subcontractors conducting the work, and require that copies remain in their possession at the work site. Caltrans shall be responsible for work conducted by its contractor or subcontractors.
5. All activities and BMPs shall be implemented according to the submitted application and the conditions in this certification. BMPs for erosion, sediment, and pollutant control shall be implemented and in place at commencement of, during, and after any ground clearing activities, construction activities, or any other Project activities that could result in erosion, sediment, or other pollutant discharges to waters of the State. The BMPs shall be implemented in accordance with the Caltrans Construction Site Best Management Practice Manual (CCSBMPM) and all contractors and subcontractors shall comply with the CCSBMPM. Caltrans shall stage erosion and sediment control materials at the work site. All BMPs shall be installed properly and in accordance with the manufacturer's specifications. If the project Resident Engineer elects to install alternative BMPs for use on the project, Caltrans shall submit a proposal to Regional Water Board staff for review and concurrence.
6. Caltrans shall prioritize the use of wildlife-friendly biodegradable (not photo-degradable) erosion control products wherever feasible. Caltrans shall not use or allow the use of erosion control products that contain synthetic netting for permanent erosion control (i.e. erosion control materials to be left in place for two years or after the completion date of the project). If Caltrans finds that erosion control netting or products have entrapped or harmed wildlife, personnel shall remove the netting or product and replace it with wildlife-friendly biodegradable products. Caltrans shall not use or allow the use of erosion control products that contain synthetic materials within waters of the United States or waters of the State at any time. Caltrans shall request approval from the Regional Water Board if an exception from this requirement is needed for a specific location.
7. Herbicides and pesticides shall not be used within the Project. If Caltrans has a compelling case as to why herbicides and pesticides should be used, a proposal for their use shall first be submitted to the Executive Officer of the Regional Water Board for review and consideration. The proposal shall include a strategy for BMP implementation to prevent discharge of pesticides to State waters.

8. Work in flowing or standing surface waters, unless otherwise proposed in the Project description and approved by the Regional Water Board, is prohibited. If construction dewatering of groundwater is found to be necessary, Caltrans shall use a method of water disposal other than disposal to surface waters (such as land disposal) or Caltrans shall apply for coverage under the Low Threat Discharge Permit or an individual National Pollutant Discharge Elimination System Permit and receive notification of coverage to discharge to surface waters, prior to the discharge.
9. Caltrans is prohibited from discharging waste to waters of the State, unless explicitly authorized by this Order. For example, no debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or concrete washings, welding slag, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature, other than that authorized by this Order, shall be allowed to enter into waters of the State. In addition, none of the materials listed above shall be placed within 150 linear feet of waters of the State or where the materials may be washed by rainfall into waters of the State.
10. Caltrans shall submit a dewatering and/or diversion plan that appropriately describes the dewatered or diverted areas and how those areas will be handled during construction. The diversion/dewatering plan shall be submitted no later than 30 days prior to conducting the proposed activity. Information submitted shall include the area or work to be diverted or dewatered and method of the proposed activity. All diversion or dewatering activities shall be designed to minimize the impact to waters of the State and maintain natural flows upstream and downstream. All dewatering or diversion structures shall be installed in a manner that does not cause sedimentation, siltation or erosion upstream or downstream. All dewatering or diversion structures shall be removed immediately upon completion of Project activities. This Certification does not authorize Caltrans to draft surface waters.
11. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall be outside of waters of the U.S. and the State. Fueling, lubrication, maintenance, storage and staging of vehicles and equipment shall not result in a discharge or a threatened discharge to any waters of the State or the U.S. At no time shall Caltrans use any vehicle or equipment which leaks any substance that may impact water quality.
12. Caltrans and their contractor are not authorized to discharge wastewater (e.g., water that has contacted uncured concrete or cement, or asphalt) to surface waters, ground waters, or land. Wastewater may only be disposed of to a sanitary waste water collection system/facility (with authorization from the facility's owner or operator) or a properly-licensed disposal or reuse facility. If Caltrans or their contractor proposes an alternate disposal method, Caltrans or their contractor shall first obtain authorization from the Regional Water Board. Plans to reuse or recycle wastewater require written approval from Regional Water Board staff.
13. If, at any time, an unauthorized discharge to surface water (including wetlands, rivers or streams) occurs, or any water quality problem arises, the associated project activities shall cease immediately until adequate BMPs are implemented. The Regional Water Board shall be notified promptly and in no case more than 24 hours after the unauthorized discharge or water quality problem arises.
14. Caltrans shall provide analysis and verification that placing non-hazardous waste or inert materials (which may include discarded product or recycled materials) will not

- result in degradation of water quality, human health, or the environment. All project-generated waste shall be handled, transported, and disposed in strict compliance with all applicable State and Federal laws and regulations. When operations are complete, any excess material or debris shall be removed from the work area and disposed of properly and in accordance with the Special Provisions for the Project and/or the 2006 Standard Specification 7-1.13, *Disposal of Material Outside the Highway Right of Way*. Within 30 days of disposing of materials off-site Caltrans shall submit to the Regional Water Board the satisfactory evidence provided to the Caltrans Engineer by the Contractor referenced in Standard Specification 7-1.13. In accordance with State and Federal laws and regulations, Caltrans is liable and responsible for the proper disposal of waste generated by their Project.
15. All imported fill material shall be clean and free of pollutants. All fill material shall be imported from a source that has the appropriate environmental clearances and permits. The reuse of low-level contaminated solids as fill on-site shall be performed in accordance with all State and Federal policies and established guidelines and must be submitted to the Regional Water Board for review and concurrence.
 16. Caltrans shall perform on-site revegetation and off-site mitigation in accordance with the application and *EA 04-1G420 Pocket Canyon Creek, Sonoma County, California Onsite and offsite Riparian Vegetation Planting Plan*, dated April 16, 2013. Restoration actions shall include revegetation of temporarily impacted areas. Restoration planting shall occur in the first full planting season (November to April) subsequent to the year construction is complete and erosion control is established.
 17. Caltrans shall incorporate willow plantings within the rock slope protection (RSP) at the base of the soldier pile wall as shown in *EA 04-1G420 Pocket Canyon Creek, Sonoma County, California Onsite and offsite Riparian Vegetation Planting Plan*, dated April 16, 2013. The Caltrans Resident Engineer, Landscape Architect, or other appropriate Caltrans staff person with expert knowledge of the required willow planting design, shall be onsite to direct the installation of the RSP and willow plantings. If the willows are planted when the *in situ* soil is not sufficiently wet to sustain willow plantings into the wet season, then Caltrans shall irrigate the willow plantings to ensure establishment and survival through the duration of the dry season.
 18. Caltrans shall submit proof of purchase of approximately 0.2 acres (8,661 square feet) of riparian habitat creation mitigation credits from East Austin Creek Conservation Bank before project construction may begin.
 19. Caltrans shall notify Regional Water Board staff within five working days upon completion of on-site restoration activities. Caltrans shall monitor and report to the Regional Water Board the progress of on-site revegetation in accordance with the application and *EA 04-1G420 Pocket Canyon Creek, Sonoma County, California Onsite and offsite Riparian Vegetation Planting Plan*, dated April 16, 2013.
 20. In the event of any violation or threatened violation of the conditions of this Order, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this Order. In response to a suspected violation of any condition of this certification, the State Water Board

may require the holder of any federal permit or license subject to this Order to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In response to any violation of the conditions of this Order, the Regional Water Board may add to or modify the conditions of this Order as appropriate to ensure compliance.

21. The Regional Water Board may add to or modify the conditions of this Order, as appropriate, to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act.
22. Except as may be modified by any preceding conditions, all certification actions are contingent on: a) Completion of all proposed revegetation, avoidance, minimization, and mitigation measures, in strict compliance with Caltrans' project description and CEQA documentation, as approved herein; b) Project construction in accordance with the project described in the application and the findings above; and c) Compliance with all applicable water quality requirements and water quality control plans including the requirements of the Water Quality Control Plan for the North Coast Region (Basin Plan), and amendments thereto. Any change in the design or implementation of the Project that would have a significant or material effect on the findings, conclusions, or conditions of this Order must be submitted to the Executive Officer of the Regional Water Board for prior review, consideration, and written concurrence. If the Regional Water Board is not notified of a significant alteration to the Project, it will be considered a violation of this Order, and Caltrans may be subject to Regional Water Board enforcement actions.
23. The authorization of this certification for any dredge and fill activities expires five years from the date of issuance. Conditions and monitoring requirements outlined in this Order are not subject to the expiration date outlined above, and remain in full effect and are enforceable.
24. Please contact our staff Environmental Specialist / Caltrans Liaison Brendan Thompson at (707) 576-2699 or Brendan.Thompson@waterboards.ca.gov if you have any questions.

Original Signed By

Matthias St. John
Executive Officer

130521_PocketCanyonCreek_401Cert

Web link: State Water Resources Control Board Order No. 2003-0017 - DWQ, General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification can be found at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0017.pdf

Original to: Samer Shaath, PM Caltrans District 6, 1352 W. Olive Ave., P.O. Box
12616, Fresno, CA 93778

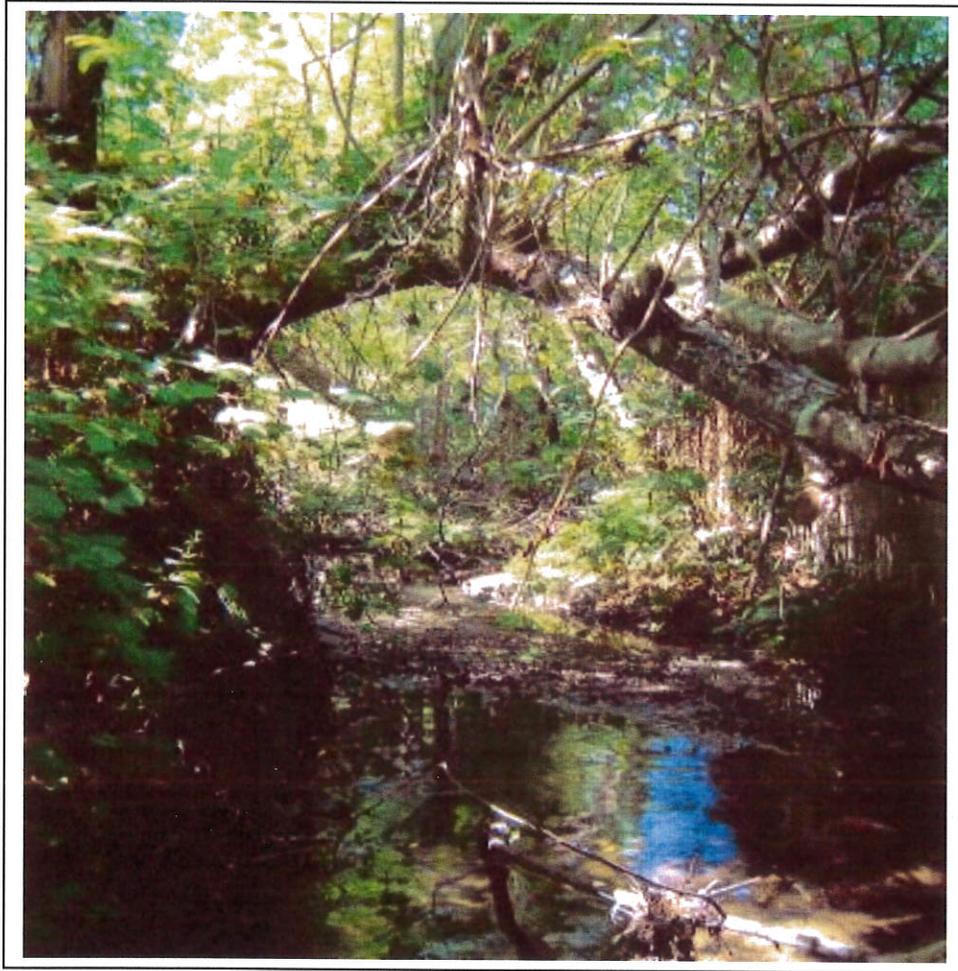
Copies to: Cyrus Vafai, PE, Branch Chief – Water Quality Permits, Office of Water
Quality, 14th Floor, MS 8F, Caltrans, 111 Grand Ave., Oakland, CA
94612

Electronic
Copies to: U.S. Army Corps of Engineers, Regulatory Functions - San Francisco
District

U.S. Fish and Wildlife Service – Sacramento Office

NOAA National Marine Fisheries Service – Southwest Region

Mitigation Monitoring Plan (MMP) for Soldier Pile Wall Project



12/15/2015.
Annual Report yr. 1
19-1
Fix Doyle on
STEVE - confirm

Pocket Canyon Creek, Sonoma County, California

Onsite and Offsite Riparian Vegetation Planting Plan

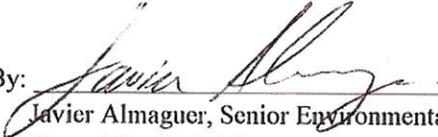
04-SON-116- PM 13.76

EA 04-1G420

Soldier Pile Wall Riparian Revegetation
EA 04-1G420

Prepared By: 
Sean Anayah, Environmental Planner (N/S)
Northern San Joaquin Valley Environmental Management
(209) 942-6011

Date: 4/16/2013

Approved By: 
Javier Almaguer, Senior Environmental Planner
Central Region Biology
(559) 445-6456

Date: 4/16/2013

Project Description:

The California Department of Transportation (Caltrans) proposes to repair and restore a segment of State Route (SR) 116 by replacing an existing culvert and a retaining wall with a soldier pile wall, and repairing road surface pavement. This segment of SR 116 is a narrow, winding, low speed, two-lane conventional highway. Work will occur within a section of Pocket Canyon Creek which drains into the Russian River. Impacts to riparian habitat are anticipated in the section of Pocket Canyon Creek within the proposed project area.

Proposed Mitigation Measures:

Ten riparian trees (see table below) within the project impact area will be permanently affected as a result of the construction of the proposed project. Per the 1602 Streambed Alteration Agreement, the California Department of Fish and Wildlife (CDFW) is requiring onsite and offsite replanting for riparian habitat that is permanently impacted by the proposed project. Mitigation shall be based on all trees regardless of diameter at breast height (DBH). To replace the riparian habitat that was removed, Caltrans shall plant a palette of native plant species onsite, while offsite, Caltrans shall mitigate the anticipated 2,887 square (sq) feet (ft) of permanent riparian habitat impacts at a 3:1 acreage ratio (8,661 sq ft).

Onsite: The onsite mitigation will occur in Caltrans right-of-way (ROW) and consist of three California bay (*Umbellularia californica*), 23 red willows (*Salix laevigata*), and 15 red alders (*Alnus rubra*). To ensure success criteria of at least 80% at the end of five years, there will be a three year plant establishment period, as well as, a concurrent monitoring period lasting five years. The first year of the plant establishment period will be the responsibility of the construction contractor. Negotiations are occurring to have the Gold Ridge Resource Conservation District maintain and monitor the onsite replacement plantings for the remaining four years required by CDFW including the two years of the plant establishment period.

Offsite: The offsite mitigation will be met through the purchase of riparian habitat credits from the East Austin Creek Mitigation Bank which is located near the City of Guerneville and the Soldier Pile Wall project. This mitigation bank is within the service area of the project and it occurs within the Russian River watershed.

Summary:

- Total Trees that will be impacted by the proposed project = 10
- Total Trees to be planted onsite = 41
- Offsite location = Credits at East Austin Creek Mitigation Bank

Table of Impacted Trees

Tree #	Common Name	DBH	Remove (R) or Trim (T)
1	California bay laurel	Main Trunk: 2"	R
2	red willow	Main Trunk: 10"	R
3	red alder	Main Trunk: 6"	R
4	red alder	Main Trunk: 5"	R
5	red alder	Main Trunk: 10"	R
6	red alder	Branch 1: 5" Branch 2: 6"	T
7	red willow	Main Trunk: 14"	R
8	California bay laurel	Main Trunk: 2"	R
9	Oak sp.	Main Trunk: 3"	R
10	Red alder	Main Trunk: 8"	R

1. Goals

The Soldier Pile Wall Project mitigation is designed to replant 2,887 sq ft of impacted riparian habitat onsite as well as preserve 8,661 sq ft of riparian habitat offsite at the East Austin Creek Mitigation Bank.

This monitoring plan is designed to assess the mitigation site's habitat development from the time of construction until the project has met or exceeded the success criteria outlined in this plan. The quantitative and qualitative success criteria include percent survival, plant vigor and health. The onsite mitigation will be deemed successful if 80% survival of plants is reached at the end of five years.

Eighty percent survival of the 41 trees replanted will be 33 surviving trees at the end of the five year monitoring period. The success criteria constitutes the means by which the mitigation site's performance will be evaluated.

2. Performance (Success) Criteria

The goals of the onsite mitigation will be considered successful if 80% survival of trees is obtained at the end of five years.

3. Planting of Trees

The trees will be planted at the designated onsite mitigation site which is identified on the design planting plans.

All plantings shall be derived from locally available genotypes if available at the time of plant installation, and installed at the onset of the rainy season.

4. Establishing Photography Stations

During the first year, the Caltrans biologist will establish permanent stations from which to photograph the mitigation site during each subsequent outing. The stations should be located as to gain the best overall view of each stand. The locations of each photography station will be indicated on a map of the site for future reference. A baseline photograph will be taken after initial plantings then during each monitoring period thereafter.

5. Monitoring Period

Monitoring of the mitigation site is required by the CDFW and is mandated by NEPA and CEQA.

This monitoring plan is to be applied to the Soldier Pile Wall project, which is to be implemented as compensation for impacts to the riparian habitat along SR 116 in Sonoma County.

Monitoring will occur annually in July or August for a period of five years to ensure that the success criteria are being met. A manual count of each tree will be done.

Photographs of the mitigation site will be taken yearly from the previously established stations in order to ascertain the overall condition of the mitigation stand.

An annual data sheet will be developed to record the following data:

- Tree #: An identification number will be given to each tree planted
- Vigor: An estimate will be made for the overall health of the plant, based on the best professional judgement of the observer. The monitor will record vigor as good (G), fair (F), poor (P), or dead (D). Vigor of planted trees should be compared to the surrounding trees outside the mitigation area.

6. Equipment

- Map of overall site location, plot locations, and photo point locations
- Data sheets
- Clipboard, pen, or pencil
- Diameter at Breast Height tape (DBH)
- Wooden stake
- Flagging, string, or twine
- Digital Camera

7. Annual Report

An annual report shall be prepared by the Caltrans biologist and submitted by December 15 of each year to CDFW. The report will discuss any corrective measures that were taken during that monitoring year. The report will evaluate and summarize the data for the current sampling session compared to the previous one. The report will specify if the goals are being achieved. A discussion of the potential problems and recommended corrective actions will also be presented. The first report will be submitted after the mitigation area has experienced one full growing season.

A copy of the annual report will be sent to:

California Department of Fish and Game
Region 3 Bay Delta 7329 Silverado Trail
Napa, CA 94558
Attn: Sandy Brunson
Attn: Melissa Escaron

8. Completion of Mitigation

At the end of 5 years, Caltrans will notify CDFW for the final inspection and to verify that the success criteria has been met and that the mitigation site is functioning.

9. Contingency Measures

The results of the monitoring program will be reviewed annually by the Caltrans biologist. If the site is failing, the Caltrans biologist will re-evaluate the site with the assistance of CDFW and the landscape architect to come up with remedial actions to ensure the success criteria will be met.

After reviewing annual reports, CDFW may also have suggestions for adjustments to the monitoring program. CDFW suggestions will be reviewed, and if appropriate will be incorporated into the following years monitoring program. The key is to anticipate that the monitoring program may need occasional adjustments to remain accurate, complete, and feasible.

The results of monitoring will be conveyed to the Caltrans landscape architect, resident engineer, and district biologist to allow them to factor the information into their ongoing maintenance program. For example, if the results of the monitoring indicate that the trees are not yet able to survive without irrigation, it would be recommended that irrigation be continued beyond the three year plant establishment period.

Attachment A:

Service Area of East Austin Creek Mitigation Bank

Attachment B:

Onsite Riparian Revegetation Plan



State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



July 14, 2014

Mr. Robert Navarro
California Department of Transportation
2015 East Shields Avenue, Suite 100
Fresno, CA 93726

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-2014-0044-R3
POCKET CANYON CREEK RETAINING WALL, STATE ROUTE 116, SONOMA COUNTY

Dear Mr. Navarro:

Enclosed is the final Streambed Alteration Agreement (“Agreement”) for the Pocket Canyon Creek Retaining Wall Project (“Project”). Before the Department may issue an Agreement, it must comply with the California Environmental Quality Act (“CEQA”). In this case, the Department, acting as a responsible agency, filed a notice of determination (“NOD”) on July 14, 2014 based on information contained in the Negative Declaration the lead agency prepared for the Project.

Under CEQA, filing a NOD starts a 30-day period within which a party may challenge the filing agency’s approval of the project. You may begin your project before the 30-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 Melissa Escaron, Senior Environmental Scientist (Specialist), at (925)786-3045 or melissa.escaron@wildlife.ca.gov.

Sincerely,

Craig J. Weightman
Environmental Program Manager
Bay Delta Region

cc: Elyse Levy – elyse.levy@dot.ca.gov
Lieutenant Jones
Warden Esquivel

Conserving California's Wildlife Since 1870

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
BAY DELTA REGION
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558
(707) 944-5500
WWW.WILDLIFE.CA.GOV



STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2014-0044-R3
Pocket Canyon Creek

CALIFORNIA DEPARTMENT OF TRANSPORTATION
POCKET CANYON CREEK RETAINING WALL

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and California Department of Transportation (Permittee) or as represented Robert Navarro.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified CDFW on February 7, 2014, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, CDFW 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 along State Route 116 at post mile 13.7, just east of the town of Guerneville, County of Sonoma, State of California.

PROJECT DESCRIPTION

The proposed slope stabilization project shall restore a segment of State Route 116 by replacing a failed culvert and replacing a retaining wall with a new 130-foot soldier pile wall. Additionally the eastbound lane will be widened to the new soldier pile wall to provide a standard 12-foot lane and a 4-foot shoulder.

A coffer dam will be created using gravel bags and a culvert to divert water around the work area. Clearing and grubbing will be necessary to establish access, but no vegetation within the creek bed will be removed for installation of the temporary coffer dam. Work within the creek bed shall consist of shoveling, dewatering with pumps, and exclusionary measures for aquatic life. The total length of the temporary coffer dam will be approximately 185 feet.

A temporary access ramp will be constructed to provide construction access. The failed retaining wall and sediment shall be removed prior to construction of the new soldier pile wall. A cast-in-drilled-hole pile foundation will extend approximately 40 feet deep to support the new soldier pile wall. I-beams will be inserted into the ground and concrete facing will extend approximately 5 feet below the creek bed. Rock slope protection (RSP) will be placed at the base, approximately 5 feet below grade, and will extend 60 feet along the new 130-foot wall. An existing 36-inch diameter culvert running perpendicular to and under the highway will be replaced in-kind and the new retaining wall will serve as a headwall for the downstream end of the pipe. The culvert will empty onto a new RSP dissipater.

A private driveway on the northwest side of SR 116 may be used for construction staging. Construction of the new soldier pile wall is expected to take between 50 and 90 days and will likely involve an excavator, drilling equipment such as a crane with auger, and a bobcat loader.

Approximately 2,887 square feet of permanent riparian impacts, and 4,704 square feet of temporary riparian impacts will be incurred by construction of the proposed Project.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include:

- California red-legged frog habitat (CRLF)
- Foothill yellow-legged frog habitat
- Central California Coast steelhead habitat
- Central California Coast coho salmon habitat
- California freshwater shrimp habitat
- Nesting birds

The adverse effects the project could have on the fish or wildlife resources identified above include:

- Temporary loss of habitat for sensitive species
- Disruption of bird nesting
- Water quality degradation
- Short-term release of contaminants

- Injury or mortality to sensitive amphibian species
- Injury or mortality to sensitive salmonid species

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 CDFW 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 CDFW 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, CDFW shall contact Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that CDFW personnel may, with notification of the Resident Engineer, enter the project site at any time to verify compliance with the Agreement.

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. These conditions apply only to CDFW 1602 jurisdiction.

- 2.1 Permittee shall conduct all work within CDFW jurisdiction between July 1 and October 31.
- 2.2 At least 30-days prior to commencing project activities covered by this Agreement, the Permittee shall submit to CDFW, for review and

approval, the qualifications for a number of biologists (Qualified Biologist) that shall oversee the implementation of the conditions in this Agreement. At a minimum, the Qualified Biologists shall have a combination of academic training and professional experience in biological sciences and related resource management activities. The Qualified Biologists shall communicate to the Resident Engineer when any activity is not in compliance with this Agreement and the Resident Engineer shall immediately stop the activity that is not in compliance with this Agreement.

- 2.3 To protect nesting birds, no project activities shall occur from February 15 through August 31 unless nesting bird surveys have been completed by a Qualified Biologist. To prevent nest abandonment, a Qualified Biologist shall survey within 500 feet of the proposed Project for nesting birds. If nests are found within the Project footprint or 500 feet from the Project footprint then a Qualified Biologist shall establish a 50-foot buffer radius for nests of non-raptor bird species or a 300-foot buffer radius for raptor nests. A Qualified Biologist shall monitor the nesting birds and shall increase the buffer, through the Resident Engineer, if it is determined the birds are showing signs of unusual or distressed behavior that may be the result of Project activities. To prevent encroachment, the established buffer(s) shall be clearly marked by high visibility material. Surveys shall be conducted during periods of peak activity (early morning, dusk) and shall be of sufficient duration to observe movement patterns. Identified nests shall be reported to CDFW. The buffer area shall be fenced or flagged off from work activities and avoided until the young have fledged, as determined by a Qualified Biologist. During work, should birds indicate unusual or distressed behavior that could be indicative of future nest abandonment, a Qualified Biologist shall stop work immediately, through the Resident Engineer, and consult CDFW on how to proceed.
- 2.4 An education session shall be conducted about species that may be present at the site. The training shall consist of basic identification of CRLF, steelhead, their basic habits, how they may be encountered in the work area, and procedures to follow when they are encountered. Any personnel joining the work crew later shall receive the same training before beginning work. The penalties for noncompliance of conditions in this Agreement shall be relayed to all project personnel. The education session shall be presented by the Qualified Biologist.
- 2.5 To prevent the animal entrapment steep-walled holes or trenches more than 1-foot deep will be covered at the close of each day by plywood or similar materials. Alternatively, an additional 4-foot high

vertical barrier will be used to further prevent the inadvertent entrapment of animals. If it is not feasible to cover an excavation, one or more escape ramps constructed of earth fill or wooden planks shall be installed. Before such trenches are filled, they shall be thoroughly inspected for the presence of trapped animals.

- 2.6 A Qualified Biologist shall conduct Pre-construction surveys immediately prior to the initiation of any ground disturbing activities within or adjacent to suitable CRLF habitat. These surveys will comprise walking transects while conducting visual encounter surveys within areas that will be subject to staging, vegetation clearing, grubbing, grading, cut and fill, or other ground disturbing activities. All mammal burrows shall be inspected for signs of CRLF usage to the maximum extent practicable.
- 2.7 A Qualified Biologist shall be present onsite to monitor for CRLF during construction activities located within suitable CRLF habitat. Through communication with the Resident Engineer, a Qualified Biologist may stop work if deemed necessary for any reason to protect CRLF and will advise the Resident Engineer on how to proceed accordingly. A Qualified Biologist shall conduct clearance surveys at the beginning of each day within or adjacent to suitable CRLF habitat and regularly throughout the workday when construction is occurring within or adjacent to suitable CRLF. If CRLF are encountered, work within 50 feet of the animal shall cease immediately until the Qualified Biologist determines work can continue without threat to CRLF. At no time shall work occur within 50 feet of a CRLF without a Qualified Biologist present.
- 2.8 Prior to handling and relocation, Qualified Biologist will take precaution to prevent introduction of amphibian diseases in accordance with the Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005). CRLF will be captured by hand, dipnet, or other USFWS-approved methodology, transported by hand, dipnet or temporary holding container, and release as soon as practicable the same day of capture. Handling of CRLF will be minimized to the maximum extent practicable. Holding/transporting containers and dipnets will be thoroughly cleaned and disinfected and will be rinsed with freshwater onsite immediately prior to usage unless doing so would result in the injury or death of the animal due to the time delay. CRLF will be relocated to the nearest suitable habitat outside of the area where actions would not result in harm or harassment.
- 2.9 Permittee shall not excavate creek bed to install the water diversion.

- 2.10 Permittee shall fit all dewatering intakes with a .2-inch wire mesh. The site shall be dewatered as necessary to provide an adequately dry work area. Any muddy or otherwise contaminated water shall be pumped to a settling tank prior to re-entering the creek. Work site dewatering can be accomplished using pumps and or siphons.
- 2.11 Prior to dewatering block nets shall be placed at the upstream and downstream end of the area to be dewatered. Once the nets are in place, a CDFW-approved biologist shall capture and relocate salmonids from the dewatered area until they are confident no fish remain. Fish capture and relocation shall continue once the dewatering process beings in order to ensure fish are not stranded during the drawdown of the dewatered area.
- 2.12 Permittee shall provide a Fish Capture and Relocation Plan to CDFW for review and approval at least 30 days prior to fish relocation activities.
- 2.13 The Resident Engineer and a Qualified Biologist shall be onsite during dewatering and aquatic species relocation activities. Capture and relocation shall be conducted in a manner that minimizes stress and injury to captured animals. Capture methods may include dip nets. All nets shall be made of a soft braded nylon material that is non-abrasive. A relocation site shall be identified and the most direct transportation route shall be determined prior to any capture. The number of animals captured and moved at any one time shall be limited to the number that can be relocated without stress or injury. Prior to handling animals, all hands and equipment shall be wetted down with stream water and shall be free of any materials including hand sanitizers, sunscreen or insect repellent. No animals shall be handled with dry hands or dry equipment. An aeration system shall be used in any live well or other holding facility. Dissolved oxygen levels shall be maintained above 6 parts per million. Water from the local collection site shall be used in live wells or other holding facilities during loading and transport. At no time shall chlorinated tap water be used. Water temperatures within any live well or other holding facility shall be kept at or below water temperature at the collection site. No non-native animals captured shall be returned to the stream or released alive.
- 2.14 Permittee shall comply with all applicable state and federal laws, including the California and Federal Endangered Species Act. This Agreement does not authorize the take of any state or federally endangered listed species. Liability for any take or incidental take of such species remains the responsibility of the Permittee for the

duration of the project. Any unauthorized take of listed species may result in prosecution and nullification of the Agreement.

- 2.15 The perimeter of the work site shall be delineated using high visibility Environmentally Sensitive Area (ESA) fencing and/or flagging to prevent damage to adjacent riparian habitat. No construction activities, within the riparian zone, will be allowed within the habitat protected by the ESA fencing or flagging.
- 2.16 Permittee shall conduct work defined in the above project description, and within the project area, during periods of dry weather. The project area is defined as the bed, bank, channel, and associated riparian habitat. The Permittee shall monitor forecasted precipitation. When $\frac{1}{4}$ inch or more of precipitation is forecasted to occur, the Permittee shall stop work before precipitation commences. No activity of the project may be started if its associated erosion control measures cannot be completed prior to the onset of precipitation. After any storm event, the Permittee shall inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sediment problems and take corrective action as needed. Seventy-two hour weather forecasts from National Weather Service shall be consulted and work shall not start back up until runoff ceases and there is less than a 30% forecast for precipitation for the following 24-hour period.
- 2.17 Permittee shall utilize erosion control measures throughout all phases of operation where sediment runoff from exposed slopes threatens to enter waterways. At no time shall silt laden runoff be allowed to enter the stream or directed to where it may enter the stream. Erosion control installations shall be monitored for effectiveness and shall be repaired or replaced as recommended by a Qualified Biologist or Water Quality Monitor to the Resident Engineer. As needed to prevent sediment transport, Permittee shall deploy soil stabilizer such as hydroseeding, netting, erosion control mats, mulch, fiber rolls, silt fences, check dams, and flow velocity dissipation devices. Permittee shall stabilize and equip construction site entrances and exits with tire washing capability. Materials containing monofilament or plastic shall not be used. Erosion and sediment control measures shall be installed prior to unseasonable rain storms.
- 2.18 To the extent practicable, Permittee shall leave the root masses of removed trees and shrubs in place. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.

- 2.19 Permittee shall install rock slope protection (RSP) material sized between 25 and 75 pounds, with diameter ranging from .75 to 1 foot. RSP shall be planted with native riparian vegetation found at the Project site.
- 2.20 Concrete shall be excluded from surface water for a period of 30-days after it is poured/sprayed. During that time the concrete shall be kept moist and runoff from the concrete shall not be allowed to enter any water body. Commercial sealants may be applied to the concrete surface where difficulty in excluding flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is cured. If groundwater comes into contact with fresh concrete, it shall be prevented from flowing towards surface water.
- 2.21 Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the creek channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the creek shall be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.
- 2.22 Refueling of mobile construction equipment and vehicles shall not occur within 50 feet of any water body, or anywhere that spilled fuel could drain to a water body. Refueling of stationary equipment requiring breakdown and setup to move will remain in place. All equipment shall be refueled with appropriate drip pans, absorbent pads, and water quality Best Management Practices. Equipment and vehicles operating in the project area shall be checked and maintained daily to prevent leaks of fuels, lubricants, or other liquids.

3. Compensatory Measures

To compensate for adverse impacts to fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

- 3.1 Permittee shall submit an Onsite Restoration Plan for temporary impacts at least 3 months prior to the start of construction. The Onsite Restoration plan shall include a plant palette of native species to be used, success criteria, a monitoring and reporting schedule, and corrective actions to be taken if mitigation measures do not meet the approved success criteria. All plantings shall be derived from locally available genotypes, if available at the time of plant

installation. The Permittee shall monitor the survival and vigor of onsite plantings for a period of 5 years to ensure attainment of 80% survivorship. Permittee shall control invasive species as needed to ensure attainment of 80% survivorship after 5 years.

- 3.2 Prior to ground disturbance, Permittee shall submit, for review and written approval, a detailed Habitat Mitigation Plan (HMP) for plant and tree mitigation to be implemented at East Austin Creek Conservation Bank in Sonoma County. The HMP shall mitigate the anticipated 2887 square feet of permanent riparian habitat impacts at a minimum of a 2:1 acreage ratio. Permittee shall implement mitigation on the Devils Creek Mitigation Area within East Austin Creek Conservation Bank. Mitigation shall be based on all trees regardless of diameter at breast height. Offsite mitigation may include a combination of habitat restoration, creation, enhancement, and/or preservation of habitat that will support a similar riparian plant community found at the project site.

CONTACT INFORMATION

Any communication that Permittee or CDFW 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 CDFW specifies by written notice to the other.

To Permittee:

California Department of Transportation
Robert Navarro
2015 East Shields Ave, Suite 100
Fresno, CA 93726
Robert.navarro@dot.ca.gov

To CDFW:

California Department of Fish and Wildlife
Bay Delta Region
7329 Silverado Trail
Napa, California 94558
Attn: Lake and Streambed Alteration Program – Melissa Escaron
Notification #1600-2014-0044-R3
Fax (707) 944-5553
Melissa.escaron@wildlife.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 CDFW'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

CDFW 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 CDFW 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 CDFW 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 CDFW to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes CDFW 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 CDFW'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

CDFW may amend the Agreement at any time during its term if CDFW 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 CDFW and Permittee. To request an amendment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in CDFW'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 CDFW 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 CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in CDFW'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 CDFW a completed CDFW "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). CDFW 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 CDFW's signature, which shall be: 1) after Permittee's signature; 2) after CDFW 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.wildlife.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on December 31, 2018, 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.

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.

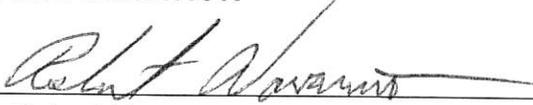
AUTHORIZATION

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 CDFW in accordance with FGC section 1602.

CONCURRENCE

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

**FOR CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

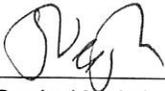


Mr. Robert Navarro

6/26/2014

Date

FOR DEPARTMENT OF FISH AND WILDLIFE



Craig Weightman
Environmental Program Manager

7/14/14

Date

Prepared by: Melissa Escaron
Staff Environmental Scientist

Date Prepared: May 2, 2014
Date Sent: June 5, 2014

FOR DEPARTMENT USE ONLY				
Date Received	Amount Received	Amount Due	Date Complete	Notification No.
2/7/14	\$ 4912.25	\$ 0		1600-2014-0044-3



VE# 082-303929

Bill Lockyer
Treasurer

STATE OF CALIFORNIA

DEPARTMENT OF FISH AND GAME

Escaron
H. Jones
with Esquivel



NOTIFICATION OF LAKE OR STREAMBED ALTERATION

Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.

Fish & Wildlife

1. APPLICANT PROPOSING PROJECT

Name	Robert Navarro			FEB 07 2014	
Business/Agency	California Department of Transportation				
Street Address	2015 East Shields Avenue, Suite 100			Napa	
City, State, Zip	Fresno, CA 93726				
Telephone	(559) 243-3468	Fax	(559) 243-3426		
Email	Robert.Navarro@dot.ca.gov				

2. CONTACT PERSON (Complete only if different from applicant)

Name	Elyse Levy				
Street Address	1976 East Dr. Martin Luther King Jr. Blvd				
City, State, Zip	Stockton, CA, 95205				
Telephone	(209) 932-2371	Fax	(209) 948-7782		
Email	Elyse.Levy@dot.ca.gov				

3. PROPERTY OWNER (Complete only if different from applicant)

Name					
Street Address					
City, State, Zip					
Telephone		Fax			
Email					

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name		Pocket Canyon Creek Retaining Wall		
B. Agreement Term Requested		<input checked="" type="checkbox"/> Regular (5 years or less) <input type="checkbox"/> Long-term (greater than 5 years)		
C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (year)	Ending (year)	Start Date (month/day)	End Date (month/day)	
2014	2018	07/10	10/15	90.00

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.

A.	<input checked="" type="checkbox"/> Standard (Most construction projects, excluding the categories listed below)
B.	<input type="checkbox"/> Gravel/Sand/Rock Extraction (Attachment A) Mine I.D. Number: _____
C.	<input type="checkbox"/> Timber Harvesting (Attachment B) THP Number: _____
D.	<input checked="" type="checkbox"/> Water Diversion/Extraction/Impoundment (Attachment C) SWRCB Number: _____ Permit Pending _____
E.	<input type="checkbox"/> Routine Maintenance (Attachment D)
F.	<input type="checkbox"/> DFG Fisheries Restoration Grant Program (FRGP) FRGP Contract Number: _____
G.	<input type="checkbox"/> Master
H.	<input type="checkbox"/> Master Timber Harvesting

6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. *Note: The Department may not process this notification until the correct fee has been received.*

	A. Project	B. Project Cost	C. Project Fee
1	Pocket Canyon Creek Retaining Wall	\$1,714,000.00	\$4,912.25
2			
3			
4			
5			
		D. Base Fee (if applicable)	
		E. TOTAL FEE ENCLOSED	\$4,912.25

7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?

Yes (Provide the information below) No

Applicant: Caltrans Notification Number: went into operation of law Date: 05/01/12

B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?

No Yes (Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.)

Continued on additional page(s)

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

8. PROJECT LOCATION

A. Address or description of project location. <i>(Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway)</i>					
From State Route 101 take exit 481B to State Route 116. The project is located on State Route 116, Post Mile 13.7, just east of the town of Guerneville. See Appendix D for a location map, vicinity map, and pictures of the project site					
<input checked="" type="checkbox"/> Continued on additional page(s)					
B. River, stream, or lake affected by the project.		Pocket Canyon Creek			
C. What water body is the river, stream, or lake tributary to?			Russian River		
D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts?			<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unknown
E. County	Sonoma				
F. USGS 7.5 Minute Quad Map Name		G. Township	H. Range	I. Section	J. ¼ Section
Camp Meeker		8 North	10 West	33	
<input type="checkbox"/> Continued on additional page(s)					
K. Meridian (check one)		<input type="checkbox"/> Humboldt <input checked="" type="checkbox"/> Mt. Diablo <input type="checkbox"/> San Bernardino			
L. Assessor's Parcel Number(s)					
085060ROW					
<input type="checkbox"/> Continued on additional page(s)					
M. Coordinates (If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes)					
Latitude/Longitude	Latitude: 38.295282 N		Longitude: 122.581266 W		
	<input type="checkbox"/> Degrees/Minutes/Seconds		<input checked="" type="checkbox"/> Decimal Degrees	<input type="checkbox"/> Decimal Minutes	
UTM	Easting: N/A	Northing: N/A		<input type="checkbox"/> Zone 10 <input type="checkbox"/> Zone 11	
Datum used for Latitude/Longitude or UTM		<input type="checkbox"/> NAD 27 <input checked="" type="checkbox"/> NAD 83 or WGS 84			

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

9. PROJECT CATEGORY AND WORK TYPE (Check each box that applies)

PROJECT CATEGORY	NEW CONSTRUCTION	REPLACE EXISTING STRUCTURE	REPAIR/MAINTAIN EXISTING STRUCTURE
Bank stabilization – bioengineering/recontouring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bank stabilization – rip-rap/retaining wall/gabion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boat dock/pier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boat ramp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channel clearing/vegetation management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Culvert	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Debris basin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diversion structure – weir or pump intake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filling of wetland, river, stream, or lake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geotechnical survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Habitat enhancement – revegetation/mitigation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Levee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low water crossing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road/trail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment removal – pond, stream, or marina	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Storm drain outfall structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporary stream crossing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utility crossing : Horizontal Directional Drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jack/bore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open trench	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

10. PROJECT DESCRIPTION

- A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.
- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
 - Specify the type and volume of materials that will be used.
 - If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

The proposed project shall preserve and restore a segment of SR 116 by replacing an existing culvert with a culvert in kind, a retaining wall with a soldier pile wall, and repairing road surface pavement. This segment of SR 116 is a narrow, winding, low speed, two-lane conventional highway. Work will occur within Pocket Canyon Creek which drains into the Russian River. There are several major construction activities which Caltrans anticipates shall cause impacts to waters of the U.S.:

- Construction work requires dewatering of a section of Pocket Canyon Creek, therefore a diversion system shall be installed within the creek, which will include the installation of a coffer dam and a culvert pipe. The coffer dam installation shall provide a dry working environment, and creek water shall be conveyed outside of the work area through the use of a pipe. The diversion system may result in short-term sedimentation in the creek downstream of the project during construction. Construction work within the creek bed shall consist of shoveling, dewatering with pumps, and exclusionary measures for fish and other aquatic life. Clearing and grubbing of riparian vegetation with an excavator will be needed to establish access, however no vegetation will be removed within the creek bed. Gravel filled bags and a pipe will be placed in the bed of the creek using the coffer dam and a downstream berm to divert water. The diversion system will be ~ 185' long.
- Along the roadway of this segment of SR 116 some existing pavement shall be repaired, exposing sub-grade sediments near the project vicinity and construction site.
- Project description continued on 10(A)
- See continuation sheet 10(B) for a more detailed description of each construction activity
- Also see continuation sheet 10(C) for the draft aerial overlay
- Also see Appendix D for project location map, vicinity map, and project area photos
- Also see Appendix E for draft project plans

Continued on additional page(s) +

B. Specify the equipment and machinery that will be used to complete the project.

Excavator, dozer, crane or boom truck, paver, roller, and semi truck

Continued on additional page(s)

C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B).

Yes No (Skip to box 11)

D. Will the proposed project require work in the wetted portion of the channel?

Yes (Enclose a plan to divert water around work site)
 No

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

See continuation sheet - 11(A)

Continued on additional page(s)

B. Will the project affect any vegetation? Yes (Complete the tables below) No

Vegetation Type	Temporary Impact	Permanent Impact
See continuation sheet - 11(B) & Table 1	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____
	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
See continuation sheet - Table 1, Table 3		
See continuation sheet 11(B) Photographs		

Continued on additional page(s)

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

Yes (List each species and/or describe the habitat below) No Unknown
See continuation sheet - 11 (C)

Continued on additional page(s)

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

See continuation sheet - 11 (D)

Continued on additional page(s)

E. Has a biological study been completed for the project site?

Yes (Enclose the biological study) No

Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.

F. Has a hydrological study been completed for the project or project site?

Yes (Enclose the hydrological study) No

Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

12. MEASURES TO PROTECT FISH, WILDLIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

An ESA fence shall be installed at the outer edge of the work area to clearly delineate where encroachment is prohibited. A WPCP and erosion BMP's shall be implemented to minimize erosion. Structural Best Management Practices include dikes along the shoulder directing highway stormwater runoff to overside drains, paved spillways that prevent the stormwater from scouring and eroding the embankment, and crushed rock to accommodate the concentrated flows. Temporary erosion and sediment control measures shall include silt fences and gravel bag berms. Permanent erosion and sediment control measures includes rock slope protection, compost, rolled erosion control netting, hydroseed, hydromulch, straw, and fiber rolls. See attached Page 12 (EC-1) of Appendix E: Draft Plans.

Continued on additional page(s)

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

No special status plants were observed within the project area. Therefore, no impacts to special status plants are anticipated.

Plastic monofilament netting (erosion control matting) or similar material will not be used in the work site because California red-legged frogs can become entangled and trapped in it. Instead, Caltrans will use alternative materials such as coconut coir matting or pacified hydro seeding compounds.

See Appendix J: Natural Environmental Study (Chapter 4, Page 43-79), for detailed information on avoidance and/or minimization measures to protect fish, and wildlife.

Continued on additional page(s)

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

No special status plants were observed within the project area. Therefore, no impacts to special status plants are anticipated. With implementation of Avoidance and Minimization measures, compensatory mitigation for impacts to fish and wildlife is not required.

Mitigation for impacts to riparian habitat shall be completed through on-site and off-site replacement planting. Plans for mitigation shall be submitted and approved by the CDFG prior to construction of the project. See continuation sheet - 12(C) Table 3

Continued on additional page(s)

13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

A. <u>404 Dredge and Fill permit - Army Corps of Engineers</u>	<input type="checkbox"/> Applied	<input checked="" type="checkbox"/> Issued
B. <u>401 Water Quality Certification - Regional Water Quality Control Board</u>	<input type="checkbox"/> Applied	<input checked="" type="checkbox"/> Issued
C. _____	<input type="checkbox"/> Applied	<input type="checkbox"/> Issued

D. Unknown whether local, state, or federal permit is needed for the project. (Check each box that applies)

Continued on additional page(s)

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

14. ENVIRONMENTAL REVIEW

A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?

- Yes (Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each)
 No (Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared)

- | | | |
|---|--|---|
| <input type="checkbox"/> Notice of Exemption | <input checked="" type="checkbox"/> Mitigated Negative Declaration | <input checked="" type="checkbox"/> NEPA document (type): <u>CE</u> |
| <input checked="" type="checkbox"/> Initial Study | <input type="checkbox"/> Environmental Impact Report | <input type="checkbox"/> CESA document (type): _____ |
| <input type="checkbox"/> Negative Declaration | <input type="checkbox"/> Notice of Determination (Enclose) | <input type="checkbox"/> ESA document (type): _____ |
| <input type="checkbox"/> THP/ NTMP | <input type="checkbox"/> Mitigation, Monitoring, Reporting Plan | |

B. State Clearinghouse Number (if applicable) 2012012036

C. Has a CEQA lead agency been determined? Yes (Complete boxes D, E, and F) No (Skip to box 14.G)

D. CEQA Lead Agency California Department of Transportation

E. Contact Person	Elyse Levy	F. Telephone Number	(209) 932-2371
-------------------	------------	---------------------	----------------

G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.

N/A

Continued on additional page(s)

H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?

- Yes (Enclose proof of payment) No (Briefly explain below the reason a filing fee has not been paid)

See Appendix F: Fish and Game Filing Fee Proof of Payment

Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.

15. SITE INSPECTION

Check one box only.

In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.

I request the Department to first contact (insert name) _____ at (insert telephone number) _____ to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

16. DIGITAL FORMAT

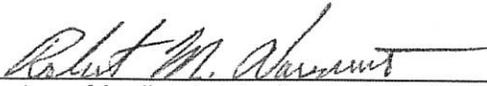
Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

Yes (Please enclose the information via digital media with the completed notification form)

No

17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.



Signature of Applicant or Applicant's Authorized Representative

02/05/14

Date

Robert M. Navarro

Print Name

FINAL HYDRAULIC REPORT

Route 116 Retaining Wall Replacement At PM 13.76 Next to Pocket Creek

Located on State Route 116 in Sonoma County

JOB:

Retaining Wall Repair Project ID: 04-14000190

LOCATION:

04-SON-116-PM 13.76

PREPARED BY (Signature)



Ginger Lu, PE# 71324
Structure Hydraulics & Scour Mitigation
June 28, 2012

This report has been prepared under my direction as the professional engineer in responsible charge of the work, in accordance with the provisions of the Professional Engineers Act of the State of California.

Hydrology/Hydraulics Report

General:

Structure Design proposes 130-ft solid pile retaining wall to replace the existing wall from the Wall Station 10+00 to 11+30 (GP_Pocket_Creek_RW.pfd) for the storm damage located near Post Mile (PM) 13.76 on State Route 116 next to the town of Guerneville in Sonoma County (Figure 1).



Figure 1: Terrain Map of Rte 116 PM 13.76

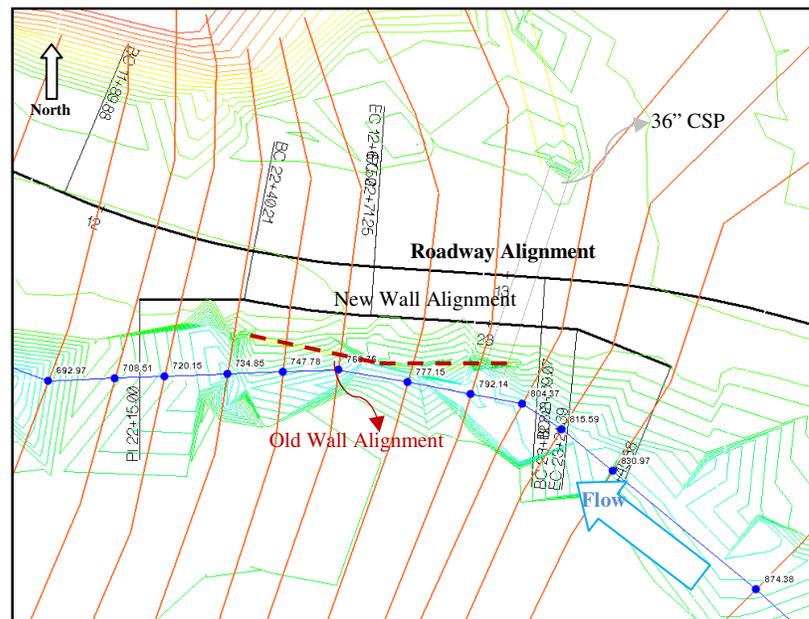


Figure 2: A plan view of the affected area (Output of the WMS Model)

The solid pile wall will be consisted of 36" center-to-center drilled hole and 8' spacing prestressed concrete piles with concrete lagging and 12" shotcrete facing. The new wall alignment (Figure 2) will be set back 6' as the closest distance from the face of the existing wall. The top of the wall will

be tied into Cast-In-Place (CIP) Overhang (Figure 3), which yields minimal 6' wide shoulder lane with concrete barrier Type732 on the top. The active 36" CSP culvert is designed to "rest" in the hole of the new wall so that the pipe can tolerate lateral earth movement and extend 1' beyond the wall face. The new wall will be anchored 25' below the finished grade, and Rock Slope Protection (RSP) on the embankment slope for the wall is proposed to attenuate local velocity at the wall face.

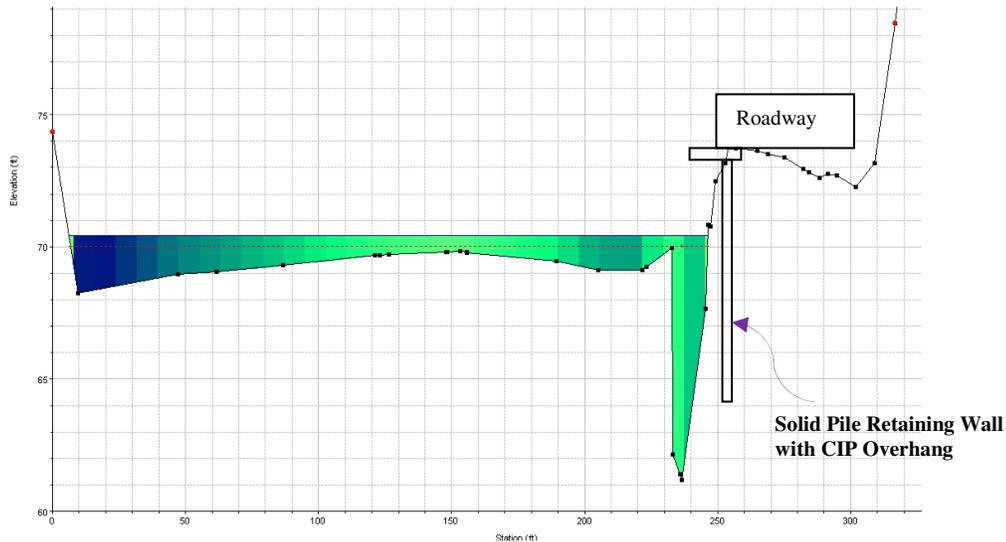


Figure 3: A cross sectional plot of the area, looking downstream

The design details of the wall from GP04_1G420_Wall_Profile.pdf are listed in Table 1.

Retaining Wall Station, ft	Design Elevation at the Top of Wall, ft	Design Elevation at the Bottom of Wall, ft	Design Elevation at the Pile Tip, ft
10+00	73.7±	73.7±	48.7±
10+11	73.4±	67.0±	42.0±
10+25.21	73.0±	67.0±	42.0±
10+56.25	72.5±	63.1±	38.1±
10+92.35	72.5±	63.5±	38.5±
11+06.39	72.3±	67.0±	42.0±
11+30	72.2±	72.2±	47.2±

Storm damages on the existing retaining wall at PM 13.76 on State Route 116 were first observed in 2010. On May 12, 2012, a field visit was made, and it was noted the top 3' to 4' sediment/fill material behind the existing wall for the roadway shoulder has washed away, and the wall has many severe vertical cracks. Since no as-built plan was found for the existing wall, the wall dimension was determined at the field, and it was approximately 7' tall and 65' long and founded on a spread footing. The headwall is separated from the road creating roughly 2' wide and 20' long gap along the south shoulder lane. Three culvert pipes were visible; one (36" CSP) on east draining the property across the road was hanging ~1.5' behind the wall, and the other abandoned two were still attached to the wall. No vertical scour hole behind the two edges of the wall was observed but there was a long shallow depression (~6" deep) along the spread footing.

This evaluation is in **vertical datum NAVD 88** and makes reference to:

- Design details: GP_Pocket_Creek_RW.pdf dated 6/13/2012, Wall_Details_(sketch).pdf dated 6/13/2012, GP 04_1G420_Wall_Profile.pdf dated 2/6/2012 and 04_1G420_Design_Xsections .pdf dated 2/3/2012, As_built.pdf dated 1/31/2012 for the 36” CSP culvert.
- Conference calls/informal discussions, Project Development Meetings, Structure Hydraulics’ field notes for 5/12/2012 field trip, and Highway Damage Assessment Report.
- PI North surveys received on 5/29/2011 and 6/15/2012. 1/3 Arc Sec data (equivalent of 10-meter DEM, old but free raster) downloaded from Nation Elevation Dataset (NED, USGS).
- Foundation Report dated 6/12/2012 from Geotech-West.

Basin:

The Pocket Creek (Pocket Canyon Creek) watershed as part of the Lower Russian River Valley is located in the Mendocino Range within west-central Sonoma County. From the headwater at 800-ft Elevation, Pocket Creek flows north westerly and pours into Russian River near Guerneville.

Using the Watershed Modeling System software (WMS 8.4), this drainage area of the Pocket Creek near the project site was mapped to be 4.44 square miles (mi²) with average precipitation of 49.5 inches, and the channel bed slope was estimated to be an average of 0.006 ft/ft. This rolling hill is made of mostly forest land with scattering vineyard/residential communities.

Discharge:

Using WMS with 1/3 Arc Sec data from NED, the drainage basin of Pocket Creek at the job site is delineated. No in-stream mining or logging activity is found on the record. Because the creek is a natural, ungaged, and small drainage basin located in rural setting without storage basins upstream, Regional Regression Method is chosen to approximate the 50-year and 100-year flood event, and the discharges are tabulated in Table 2.

<i>Table 2, Pocket Creek,</i>		
Drainage Area = 4.44 mi ² , Channel slope = 0.006 ft/ft		
<i>Flood Frequency</i>	<i>50-year</i>	<i>100-year</i>
<i>Flow Rate, cfs</i>	1327	1400

Stage/Velocity:

Pocket Creek is a natural somewhat winding stream with dense vegetation and lots local drainage points. The affected site is located on north bank of Pocket Creek, a rather narrow section of the creek, and the channel capacity of the section is around 30% of 100-year flood event. According to a local resident, the storm water at any given large storm events overflows the south bank of the creek.

Using a composite of the detailed survey by PI North with NED (1988 NAVD), cross-sections of the channel are cut in WMS 8.4 and exported into hydraulic analysis software - HEC-RAS (4.1.0). A roughness coefficient of 0.04 and boundary condition of normal depth (S = .006) are applied to

produce the following hydraulic results in Table 3 for the existing and proposed condition. Changes in the channel geometry according to 04_1G420_Design_Xsections.pdf were input into the models to complete the proposed condition.

Table 3: Water Surface Elevation (WSE) & Averaged Velocity (AV)								
Drainage Area = 4.44 mi ² , Channel slope = 0.006								
<i>River Station (RS), ft</i>	100-year (Q₁₀₀ = 1,400 cfs)				50-year (Q₅₀ = 1,327 cfs)			
	<i>Water Surface Elevation, ft</i>		<i>Average Velocity, ft/s</i>		<i>Water Surface Elevation, ft</i>		<i>Average Velocity, ft/s</i>	
	<i>Existing</i>	<i>Proposed</i>	<i>Existing</i>	<i>Proposed</i>	<i>Existing</i>	<i>Proposed</i>	<i>Existing</i>	<i>Proposed</i>
830.97	70.82	70.62	3.14	3.59	70.77	70.57	3.08	3.53
815.59	70.72	70.5	3.42	3.77	70.67	70.44	3.35	3.72
804.37	70.7	70.49	3.14	3.1	70.65	70.44	3.07	3.03
792.14	70.62	70.45	3.4	3.11	70.57	70.39	3.33	3.04
777.15	70.55	70.38	3.4	3.2	70.5	70.33	3.32	3.14
760.76	70.28	70.27	4.6	3.51	70.23	70.22	4.52	3.44
747.78	70.18	70.17	4.24	3.77	70.13	70.11	4.17	3.7
734.85	70.04	70.07	4.38	3.88	69.99	70.01	4.31	3.82
720.15	70.01	70.03	3.57	3.38	69.96	69.98	3.49	3.3
708.51	69.96	69.96	3.55	3.55	69.91	69.91	3.47	3.47

All design specifications in Table 1 are designated by the wall stationing and the highway stationing is used for potential excavation details. The wall stationing (WS) shown is on a different alignment, and the river stationing (RS) is mapped along the river by WMS 8.4. Because the hydraulic results are produced by HEC-RAS in RS, RS is paired with WS and HS in Table 4.

Table 4: Station Conversion						
<i>WS (Wall Station), ft</i>	10+00	10+11	10+26	10+51	10+90	11+30
<i>HS (Highway Station), ft</i>	12+15	12+23	12+38	12+65	13+04	13+42
<i>RS (River Station), ft</i>	708.51	720.15	734.85	760.76	792.14	830.38

Streambed/Drift:

In February of 2010, Geotech West drilled two borings, one next to the storm damaged shoulder lane of the westbound direction and the other on the opposite side of the road. The subsurface soil next to the existing wall was composed of moderately soft and intensely weathered sedimentary rock. This soil material is considered to be highly erodible. The strata on the other side of the road showed 5' soft clayey silt over 15' of clay, sand and gravel mix layer underlain with moderate soft fractured sandstone.

The May 2012 field visit confirmed the presence of alluvial silty-clayey sand, gravel, rocks with fairly dense shrub coverage in the overbank area of the low-flow channel. Several sections of the channel were obstructed by tree/shrub debris (8' wide x 6' tall). Considering dense shrub coverage, debris potential is expected to be high.

Though there is no historic cross section available or as-built plans for the affected area, the channel profile plot from the models suggest that the entire main channel along the wall might already have subsided 1'.

Summary & Recommendation:

<i>Table 5: Recommended Hydraulic Summary for the Proposed Retaining Wall</i>					
<i>Retaining Wall Station (ft)</i>	<i>WSE (ft)</i>	<i>Elev. (ft) @ Wall Top</i>	<i>Scour # (ft)</i>	<i>Finished Ground Elev. (ft)</i>	<i>Scour Elev. (ft)</i>
11+30	70.62	72.6	n/a	72.7	n/a
11+15	70.5	72.5	3.0	68.6	65.6
11+05	70.49	72.5	5.0	66.5	61.5
10+90	70.45	72.5	5.0	63.3	58.3
10+67	70.38	72.4	5.0	63.1	58.1
10+51	70.27	72.3	5.0	63.1	58.1
10+36	70.17	72.2	5.0	65.1	60.1
10+26	70.07	72.1	5.0	67.0	62.0
10+11	70.03	72.0	3.0	68.4	65.4
10+00	69.96	72.0	n/a	72.0	n/a

- The top of the retaining wall usually should be at least 2’ higher than the 100-year WSE to keep the water waves from overtopping of the wall and eroding downward from the top. With the CIP overhang design on the top of the wall, the flood water cannot penetrate the overhang and removing material from the top, and hence the wall height will no longer be a concern.
- Accounting for vertical vortex against an obstacle by water, scour elevation is an elevation of a scour hole located below river thalweg. When scour potential reaches pile tip, wall section can be overturned without lateral soil support causing wall failure.
 - a. Combining with relatively shallow channel slope, moderately dense vegetation coverage, small channel capacity, and undifferentiated thalweg for the main channel, the risk of thalweg migration and local scour is not significant.

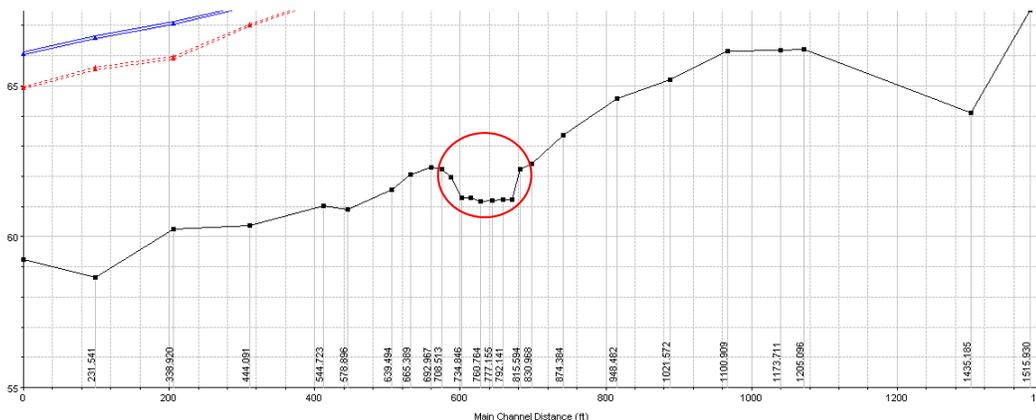


Figure 4: Pocket Creek Main Channel Profile Plot

- b. 1’ drop in elevation from RS804 (WS11+05) to RS734 (WS10+26) shown in the channel profile plot (Figure 4) suggests that channel degradation is possibly caused by the plunging effect of the 36” CSP outflow, and the total scour number is advised to be

**Emergency Roadway Repair
Sonoma County
04-SON-116-PM 13.76
Project ID: 04-14000190**

maximally 5' for the above specified area. Scour elevations listed in Table 5 is available for reference. The design elevations at the bottom of the wall in Table 1 are within the desired limit except WS 11+06.39, where the wall face needs to be 0.5' deeper or the finished ground needs to be 0.5' higher.

- The existing 36" CSP culvert draining surface runoff from the property across the highway may need to be replaced if the quality of the pipe is in question. The final recommendation of the pipe replacement will be determined by a District representative during construction.

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. GORDON DANKE
Senior Bridge Engineer
Structures Design

Date: May 30, 2014

Attention: Pete Norboe

File: 04-SON-116- PM 13.8
EA 04-1J3201
EFIS 0414000190
Landslide (Washout) Repair

From: 
V. KHATAOKHOTAN
Transportation Engineer
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services


HOOSHMAND NIKOUI
Chief, Branch A
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject : Foundation Report for Soldier Pile Wall

1. INTRODUCTION

As per your request Memo dated February 14, 2012, we are providing Office of Structure Design with foundation recommendations for the design of the proposed soldier pile wall for permanent repair of the landslide (washout) at the above referenced project. The project is located on Route 116 at PM 13.8, Sonoma County, (see Exhibit A, location map).

1.1 History

In January 2010, a small slide, about 44ft wide by 9ft deep, has occurred causing the existing retaining wall (Cantilever Concrete Wall) to overturn towards the Pocket Creek. A portion of this retaining wall acted as a headwall to an existing 36 inch CSP. This CSP pipe is carrying water from the property (12245 Pocket Canyon Highway) on the opposite side (North) of the Route 116 and discharging it into the Pocket Creek. The rotational failure of the retaining wall has caused the separation of the pipe from the headwall. Because of this, the water from the 36 inch pipe is discharging behind the fallen concrete wall.

We believe that scouring is the main cause of the rotational failure of the existing retaining wall. The scouring at the toe of the wall undermined the foundation of the wall, and reduced the rotational resistance of the wall. The wall initially rotated enough to cause the separation of the existing 36 inch CSP. The water discharged through CSP pipe into the backfill increased the active pressure behind the wall and resulted in total collapse of the wall.

MR. GORDON DANKE

Attn: Pete Norboe

May 30, 2014

Page 2

In order to repair this landslide, we have recommended that the existing wall to be removed and replaced with a soldier pile wall with concrete lagging. Due to the shortage of time it was decided to use a temporary measure to protect the road under a Director Order and initiate a project to replace the existing wall and permanently repair the landslide (washout).

Under a Director's Order, a geosynthetic reinforced embankment (wrapped face) with lightweight fill was recommended and designed by the Office of Geotechnical Design West (OGDW) and constructed in March 2010 (see Exhibit B). This temporary geosynthetic reinforced embankment has performed well to date. For more information regarding the temporary repair, refer to the attached memo (Hooshmand Nikoui to Kim Le) dated February 25, 2010 (refer to Attachment A).

2. PROJECT PURPOSE AND NEED

The need for this project is to permanently repair the landslide (washout) and replace the existing failed cantilever concrete wall with soldier pile wall. According to the plans and X-Sections, Attachment B, the entire existing failed wall along Pocket Creek will be replaced with a new retaining wall. Rock slope protection will be placed at the base of the new wall, along the creek bank to avoid future scouring. The eastbound lane will be widened to 12 feet standard and 4 feet wide shoulder within the limits of the new retaining wall.

This Foundation Report (FR) provides recommendations for a permanent retaining wall. Recommendations contained in this report are based on the submitted layout plan and cross section plans, field survey, subsurface exploration, laboratory test results and foundation analysis.

3. SCOPE OF WORK

The following tasks were performed for the preparation of this Foundation Report:

- Review of as-built plans;
- Field geotechnical exploration, including drilling 2 borings;
- Review of previously prepared memos by this office;
- Laboratory testing results on selected samples;
- Foundation design analysis; and
- Preparation of this Foundation Report.

4. SITE GEOLOGY AND SEISMICITY

4.1 Regional Geology

MR. GORDON DANKE

Attn: Pete Norboe

May 30, 2014

Page 3

The failed wall site is located in the coastal and or the central Belt of the Franciscan Complex of the Coast Range province. The material behind the wall appears to be composed of embankment/fill material derived from weathered shale and sandstone. The fill materials are underlain by sandstone of late Eocene to Late Cretaceous (Memo dated February 10, 2010 by Rifaat Nashed). The sandstone is mostly massive, brown and orange weathering, green to gray feldspathic lithic wacke, and contains detrital biotite and muscovite in places. Locally, includes disrupted thin beds of sandstone and dark gray shale and slate.

4.2 Site Geology

The Geologic Map of Santa Rosa Quadrangle shows the proposed project location, culvert head wall, lies on Franciscan Complex mélange. The Franciscan complex is a 'Block-in matrix' formation, with harder blocks of all sizes randomly distributed in a soft, sheared matrix. Rocks in the Franciscan complex include sheared argillite, serpentine, and greywacke sandstone as shown in Exhibit C.

4.3 Seismicity

The site is located about 10.5 miles from San Andreas Fault. Caltrans ARS program online was used to estimate spectral acceleration curves as shown in Exhibit D. Table 1 below lists the faults within near proximity to the project site, their maximum credible earthquake, and expected peak ground acceleration.

FAULT	Distance from project	Maximum Credible Earthquake	Peak Ground Acceleration
San Andreas	10.5 miles	7.9	0.5 g

4.4 Liquefaction

Liquefaction potential is considered very low.

5. SUBSURFACE INVESTIGATION

The subsurface investigation was conducted in February of 2010. Two power borings with SPT sampling were performed for this culvert wall. The borings were advanced to a depth of about 30ft and 40ft below ground surface. The 30ft deep boring, R10-001, was drilled in the shoulder of westbound direction, and the 40ft deep boring, R10-002, drilled in the eastbound lane of the

MR. GORDON DANKE

Attn: Pete Norboe

May 30, 2014

Page 4

Highway 116. All foundation soil classifications were based on Caltrans "Soil and Rock Logging, Classification, and Presentation Manual".

The subsurface soil encountered in R10-001 was entirely of moderately soft weathered sedimentary rock. The formation encountered was intensely weathered. On the other hand, Boring R10-002 showed that the top 5ft of soil below the pavement section consist of very soft clayey silt over soft to stiff silty clay layer mixed with some sand and gravel to depth of about 15ft. Underlying the clay layer was an approximate 4ft thick medium dense sand layer. Underlying the sand layer, the boring encountered moderately soft sandstone layer to the bottom of boring. The sandstone layer encountered was intensely weathered and fractured. It should be mentioned that under the Director's Order, temporary repair (as mentioned above), a major portion of the soft clay below the roadway was removed and replaced with lightweight geosynthetic reinforcement in March 2010. For a detailed subsurface profile, please refer to LOTB sheet.

6. GEOTECHNICAL TESTING

6.1 In-Situ Testing

Laboratory testing was performed on selected samples of the subsurface materials obtained from the subsurface investigation. Tests were performed to determine the engineering properties of the subsurface materials for use in the foundation analysis. The tests performed included: mechanical analysis (Sieve and Hydrometer), Atterberg Limits (Liquid Limit, Plastic Limit and Plasticity Index), and Unconfined Compression Test. All tests were performed in general, in accordance with American Society for Testing and Materials (ASTM) standards or California Test Methods (CTM).

7. CORROSION EVALUATION

Corrosion studies were conducted in accordance with the requirements of California Test Method No. 643. The Department considers the site to be corrosive to foundation elements if one or more of the following conditions exist for the representative soil samples taken at the site:

Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm, or the pH is 5.5 or less.

The following tables provide the corrosion test summary:

MR. GORDON DANKE
 Attn: Pete Norboe
 May 30, 2014
 Page 5

Table 2 -----Summary of Corrosion Test for Soldier pile wall

<i>Boring</i>	<i>SIC Number</i>	<i>Sample Depth (ft)</i>	<i>Resistivity (Ohm-Cm)</i>	<i>pH</i>	<i>Chloride Content (ppm)</i>	<i>Sulfate Content (ppm)</i>
R-12-003	CVK-0001	3 to 6	5638	6.79	N/A	N/A

Based on the test results from the Materials Engineering Testing Services (METS) of Caltrans, the foundation soils at the proposed soldier pile wall are considered non-corrosive.

8. FOUNDATION RECOMMENDATIONS

Based on the site condition and the results of our field investigation, we recommend that a soldier pile wall be constructed at this location. This wall will cover the entire unstable area and replaces the entire existing retaining wall. It is our understanding that pressure treated timber lagging is proposed for the proposed soldier pile wall. To protect against the wall scouring, the concrete lagging will be installed between the soldier beams for an additional 3 feet below the creek bed. According to plan and X-Sections provided, the proposed soldier pile wall will be about 95 ft long (Station 12+11 to Station 13+06) and will be about 12 feet maximum in height.

The temporary Geosynthetic Reinforced Embankment (wrapped face) needs to be removed completely before drilling for drilling the CIDH piles. The removed lightweight fill (excluding the geosynthetic elements) may be used as backfill behind the proposed soldier pile wall.

Lateral Earth Pressures

For active pressure against the wall, use the following:

- Between 0 to 15ft depth (dredge line):

Internal friction angle $\phi=30$ degrees
 Cohesion $c=500$ psf
 Soil unit weight $\gamma =120$ pcf

MR. GORDON DANKE

Attn: Pete Norboe

May 30, 2014

Page 6

- For earth pressure distribution, use a triangular pressure distribution
- A rectangular pressure diagram from top of the wall to the depth of 10ft, for traffic surcharge equivalent to about 2ft of fill
- The wall shall be capable of resisting an additional seismic uniform pressure estimated to be equal to 2H psf.

For passive pressure against the soldier piles (below 15ft depth), use the following:

Internal friction angle $\phi=36$ degrees

Cohesion $c=100$ psf

Soil unit weight $\gamma=125$ pcf

Friction factor $=3/4 \phi=27$ degrees

Use an Isolation factor of 3.

Vertical Capacity of Soldier Piles

The ultimate vertical compression and tension capacities of piles may be calculated using the following parameters:

- Use ultimate unit pile shaft friction of 1.26 ksf per unit surface area of the pile length below the dredge line of the wall.
- Use 60 percent of the compression shaft resistance values mentioned above to calculate the ultimate tension (uplift) resistance of the pile.

The above recommendations are based on parameters established by our field exploration and engineering judgments.

Note: Consult with District Hydraulic Section to verify the scour depth for the wall.

9. CONSTRUCTION CONSIDERATIONS AND REQUIREMENTS

The following construction considerations and requirements should be included in the design and construction specifications for the proposed wall:

- Groundwater was not measured during the drilling operation, because drilling was done by rotary wash method and groundwater can't be measured by this method. But groundwater is assumed to be present in the shallow depth, thus may cause minor caving to depth of about 15ft. During drilling operation for the proposed soldier beam piles, we believe that minor

MR. GORDON DANKE

Attn: Pete Norboe

May 30, 2014

Page 7

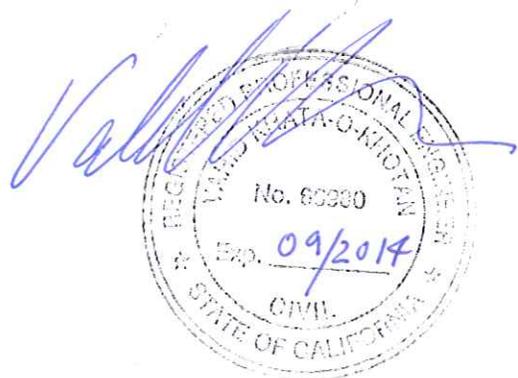
caving of the drilled holes will likely to occur. Thus, use of casing for these depths are encouraged.

- Since the temporarily built reinforced slope has to be removed prior to drilling for CIDH piles, the top 5 or 6 ft of lagging need to be formed.
- The contractor may encounter difficulties during drilling for the soldier beam pile below 15ft elevation. This is likely due to the presence of intensely weathered moderately soft rock (sandstone), proper drilling equipments should be considered for drilling through the type of rock present.
- Installation of the CIDH piles should be performed in accordance with Section 49-3 of the 2010 Caltrans Standard Specifications.
- The drilling and concrete placement for CIDH pile construction shall be staggered. No open holes shall be adjacent.
- For ease of construction, the area between the concrete piles in the first stage of the work could be shotcreted and backfilled last. The contractor might have an easier access to do the work and have a less impact and disturbance on the creek environment.
- To prevent overspray from the shotcrete operation, a protective tarp is recommended at some distance beyond the perimeter of the wall at the edge of the creek to minimize overspray impact.

Should you have any questions, please call Vahid Khata-O-Khotan at (510) 622-1729 or Hooshmand Nikoui, Brach Chief at (510)286-4811.

c: TPokrywka, HNikoui, TNguyen, HBinning, KLe/Ng/SKakihara, WKhalife, Daily File, Project File

VKhata-o-khotan/mm



"Caltrans improves mobility across California"



Exhibit A.
 04-1G4200
 04-SON-116 PM 13.7
 Project Location



Exhibit B.

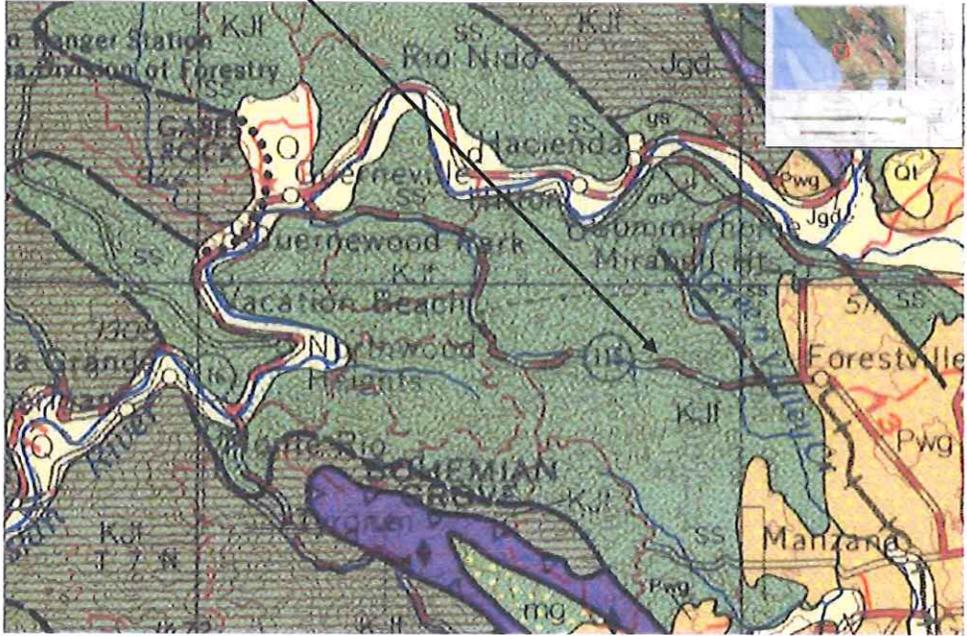
04-1G4200

04-SON-116 PM 13.7

Geosynthetic Reinforced Embankment

Project

Location



Franciscan Complex* (*ss-sandstone, shale, conglomerate; ch-chert; gs-greenstone; mg-metagraywacke*)



Serpentinized ultramafic rocks*



Metamorphic rocks of uncertain age.
ls - limestone and marble
(*Biotite schist and quartzite*)

* Horizontal pattern denotes melange terrane

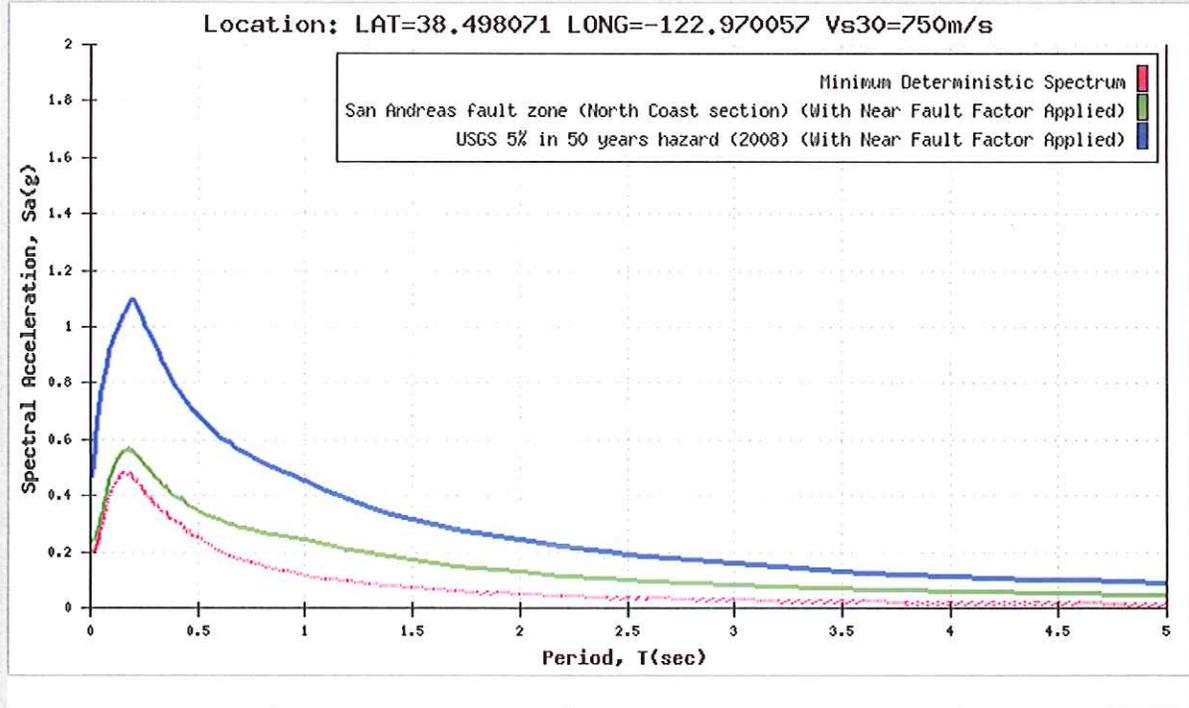
Exhibit C.

04-1G4200

04-SON-116 PM 13.7

Geologic map

CALCULATED SPECTRA



Spectral Acceleration Curve

Exhibit D.

04-1G4200

04-SON-116 PM 13.7

Seismic Acceleration Curve

Attachment A

Memorandum

*Flex your power!
Be energy efficient!*

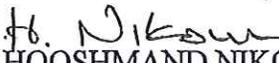
To: MR. KIM LE
District Office Chief
Office of Maintenance Services

Date:

February 25, 2010

Attention: Steve Kakihara

File: 04-SON-116 PM 13.76
04- 930322 Storm Damage
Culvert Head Wall/
Retaining Wall Failure
Along Pocket Creek

From: 
HOOSHMAND NIKOUI
Chief, Branch A
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: Director Order- Winterization of the Washout Area – Geosynthetic Reinforced Embankment

This memo presents recommendations for temporary stabilization of the washout area (winterization) for the above referenced storm damage project. We have investigated the washout that has caused the culvert headwall/retaining wall to overturn along the eastbound direction of Hwy 116 (Pocket Creek Hwy) and provide you with our recommendation memo dated February 04, 2010. Our recommendation was to construct sheetpile wall and RSP. However, after we conducted foundation exploration we concluded (based on the boring information) that sheetpile wall would not be a feasible solution due to the existent of shallow hard bedrock which sheetpiles would not be able to penetrate in order to provide adequate passive resistance.

After field and conference call meetings (most project team member involved) on February 18 and 24, respectively, we recommended that the best solution be to temporarily stabilizing the washout area under force account and use soldier pile wall with combination of concrete and timber laggings through PS&E process.

Temporary Slide Repair – Winterization Recommendation

The following steps are recommended:

Step 1- Close EB lane place K-Rails

Step 2- Excavate the slide debris between the existing wall and the scarp of the slide to a maximum depth of 1 foot in order to create a smooth working platform. Also, remove all

MR. KIM LE

ATTN: Steve Kakihara

February 25, 2010

Page 2

plants and vegetation behind the existing wall.

Step 3- Construct the Geosynthetic Reinforced Embankment (wrapped face) as shown on the attached Exhibit A. Geosynthetic reinforcement should be installed at 12-inch vertical spacing. The long-term design strength (LTDS) of the geosynthetic reinforcement should not be less than 1000lb/ft. The embedment of geosynthetic reinforcement is the distance from the face to the scarp of the slide (3 ft to 6 ft). We have estimated the following:

Geosynthetic Reinforced Embankment

- L = 40' length of the Geosynthetic Reinforcement Wrapped Wall
- D = 3' to 6' Embedment Depth
- Long-term design strength (LTDS) = 1000 lb/ft
- 12" wrapped vertical spacing
- H = 3' to 5' Height of Geosynthetic Reinforcement Wrapped Wall

Backfill Material Alternatives

- Lightweight Fill (wet unit weight = 55 pcf)
- Crushed Rock 6" maximum size
- Imported Borrow PI < 20

Estimated Cost of Geosynthetic Reinforced Embankment

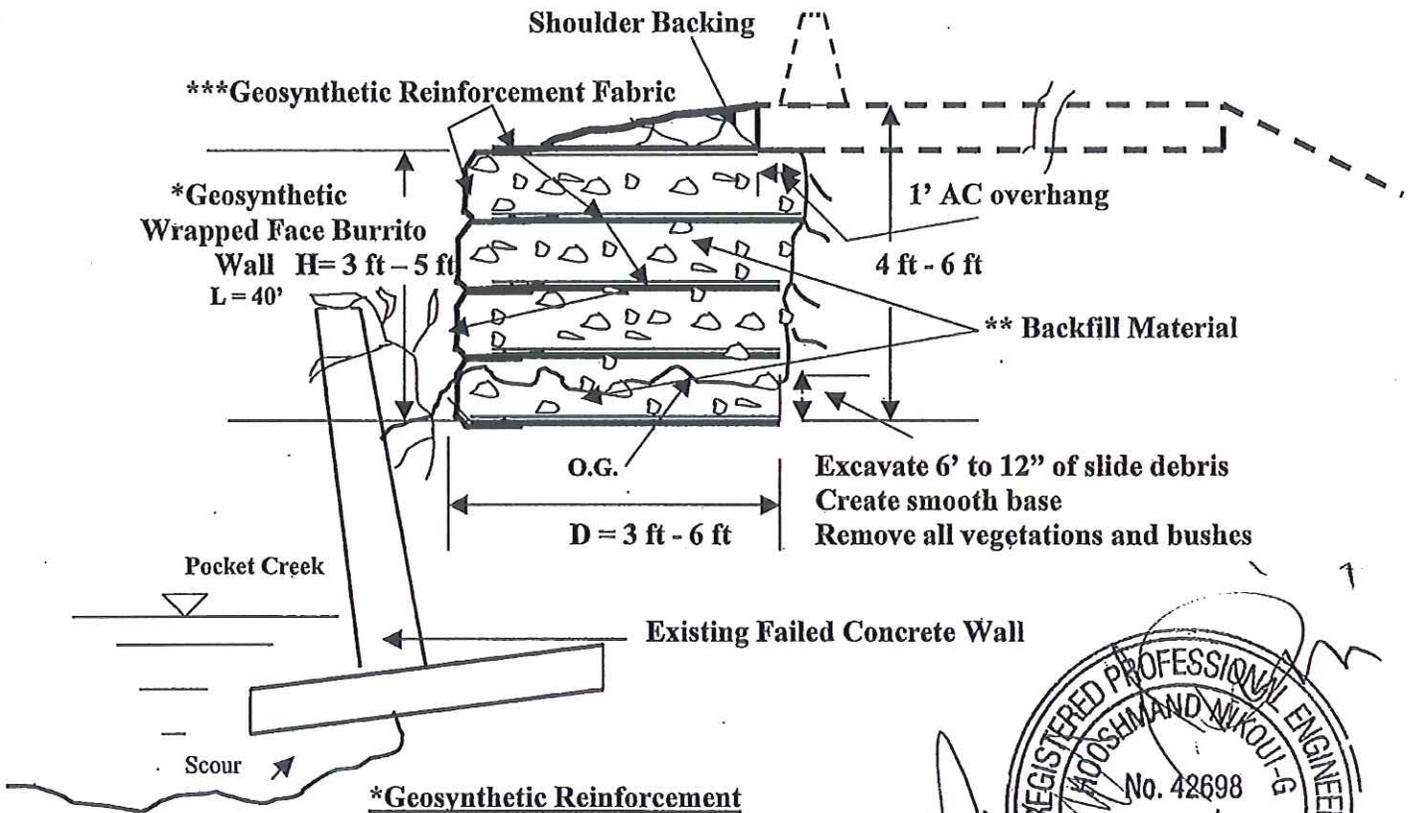
A conservative estimate would be \$35/ft² of wrapped facing. Assume L = 40' H (avg.) = 4' then Area = 160 ft² and Cost = \$5,600 say \$6,000.00 The other cost should be determine by others.

If you have any questions or need additional information, please call me at 510-286-4811.

Attachments

c: TPokrywka, HNikoui, KLe/Ng/Kakihara, Gdanke/Pnorbe, Gwilcox/Rnashed, CCashin/CMorton, Rnavarro, Jcook/Tsong, Wkhalife, Fmonemzadeh, Jlam, jChan, Rduncan, Dha,Kchandler, jKracke, Project Files, Daily Files

HN:hn

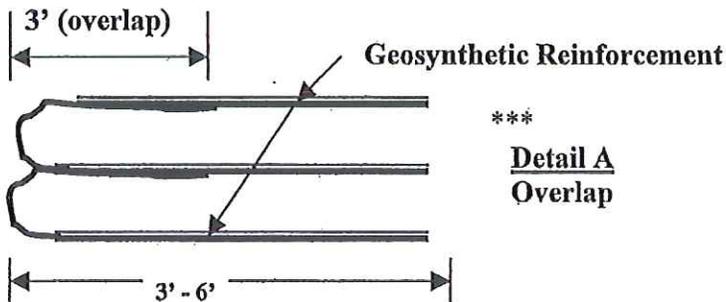
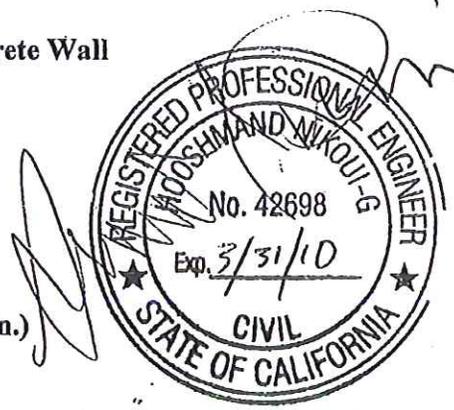


***Geosynthetic Reinforcement**

- L = 40' Length of the Wall
- D = 3' to 6' Embedment
- 1000 lb/ft Ultimate Tensile Strength (min.)
- 12" Wrapped Vertical Spacing (max.)

**** Backfill Material can be either:**

- Lightweight Fill (wet unit weight = 55 pcf)- Preferred
- Crushed Rock 6" Maximum size
- Imported Borrow PI < 20



By: H. Nikoui, P.E.
02/24/10

EXHIBIT A
Winterization of Washout
Son-116 PM 13.76

Attachment B

Dist	County	ROUTE	TOTAL MILES	DATE
04	SON	116	13.7	

REGISTERED CIVIL ENGINEER DATE

TRAFFIC APPROVAL DATE

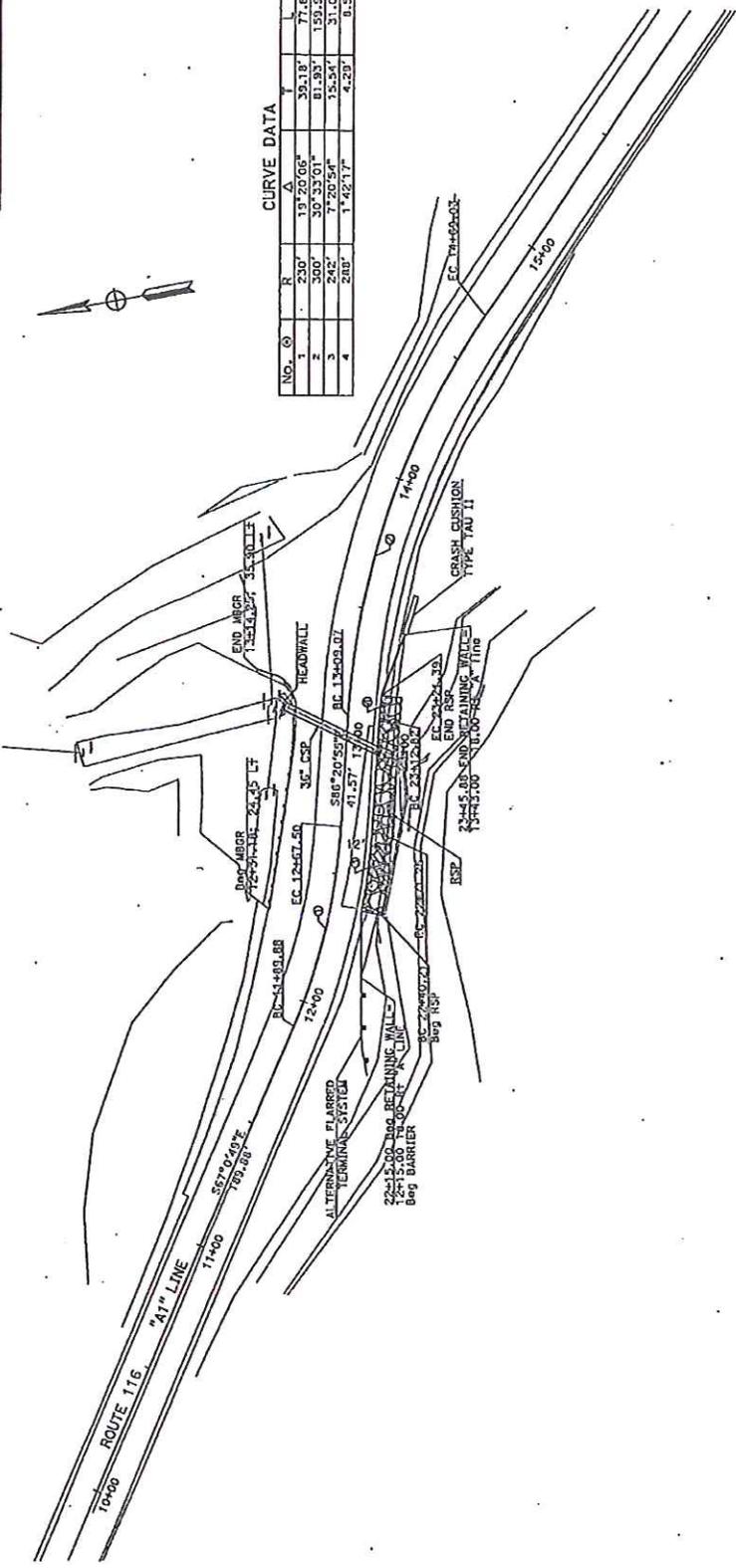
DATE OF APPROVAL FOR THE DISTRICT OFFICE

DATE OF APPROVAL FOR THE DISTRICT OFFICE

DATE OF APPROVAL FOR THE DISTRICT OFFICE



NOTE: FOR ACCURATE RIGHT OF WAY AND ACCESS DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



CURVE DATA

NO.	Δ	R	Δ	L
1	18° 06'	230'	35.18'	77.65'
2	30° 29' 00"	500'	30.29'	131.80'
3	242° 37' 20.54"	242'	15.32'	31.30'
4	1° 42' 11"	200'	4.20'	8.57'



LAYOUT
L-1

SCALE: 1"=20'

DATE PLOTTED: 12-13-2010
FILE PLOTTED: 12-13-2010
PROJECT NUMBER & PHASE: 0000000001
UNIT: 0000
RELATIVE BORDER SCALE: 1" = 100'
BORDER LAST REVISED: 7/2/2010
BORDER FILE: 20100704.dwg

DESIGNED BY	THANH NGUYEN
CHECKED BY	HA/REET BINH
DATE REVISED	
REVIEWED BY	MIT NITHAYAN

DATE	COUNTY	ROUTE	POST MILES	SHEET TOTAL
04	San	116	XX	XX
REGISTERED CIVIL ENGINEER DATE				
PLANS APPROVAL DATE				
BY: [Signature]				
FOR: [Signature]				
ON BEHALF OF THE STATE OF CALIFORNIA				
COUNTY OF SAN DIEGO				



DATE PLOTTED: 13-SEP-2012
 TIME PLOTTED: 14:23
 04-27-11

TYPICAL CROSS SECTION

X-1

NO SCALE

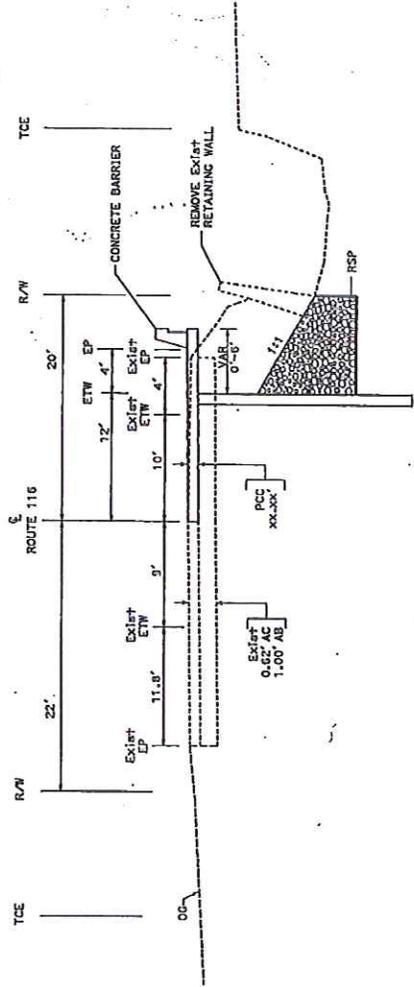
PROJECT NUMBER & PHASE

UNIT 1420

RELATIVE HORIZONTAL SCALE
 IS IN INCHES

UPGRADE: 04133306
 SHEET FILE: 04133306001.dwg

BORDER LAST REVISED 7/27/2010



ROUTE 116
 STA 12+15 TO STA 12+77

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	THOMAS HAYDEN	CHECKED BY	HARVEY BINKINS	DATE REVISION	REVISION BY	ANDREW LN
06-DESIGN							

DATE	COUNTY	ROUTE	POST MILES	SHEET TOTAL
04	Son	116	XX	XX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

BY ROUTE 116 PROJECT NO. 0419420

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

BY ROUTE 116 PROJECT NO. 0419420



TYPICAL CROSS SECTIONS
X-2

NO SCALE

PROJECT NUMBER & PHASE 0419420

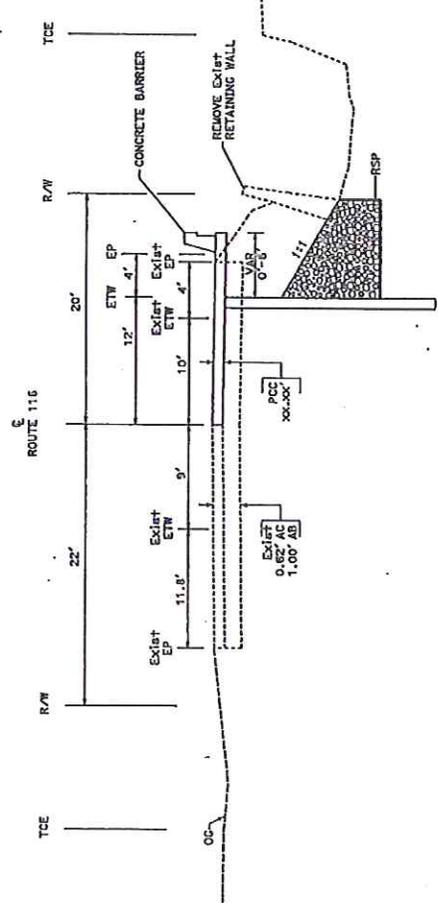
UNIT 1459

RELATIVE HORIZONTAL SCALE 1" = 10'

DATE 7/2/2010

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

00-DESIGN	FUNCTIONAL SUPERVISOR	TRANSPORTATION	DATE REVISION	DATE REVISION	DATE REVISION
00-DESIGN	TRANSPORTATION	TRANSPORTATION	DATE REVISION	DATE REVISION	DATE REVISION
00-DESIGN	TRANSPORTATION	TRANSPORTATION	DATE REVISION	DATE REVISION	DATE REVISION



ROUTE 116
STN 12+77 TO STA 13+43

DATE PLOTTED 04-13-2010 10:11:11 AM

From: [Nijhawan, Amit@DOT](mailto:Nijhawan.Amit@DOT)
To: [Childress, James J@DOT](mailto:Childress.JamesJ@DOT)
Cc: [Ramirez, Arthur A@DOT](mailto:Ramirez.ArthurA@DOT); [Hanif, Shakila@DOT](mailto:Hanif.Shakila@DOT)
Subject: FW: EA 04-3J160-Son-116-PM 13.7-Request for quote on non-potable water
Date: Friday, April 24, 2015 12:42:54 PM

James,

Contractor can get the water from Sweetwater Springs Water District. See email below..

Thanks

Amit Nijhawan, PE
Design 1, Branch M
Ph. (559) 243-3811
Fax. (559) 243-3840

From: Julie Kenny [mailto:sws@monitor.net]
Sent: Friday, April 24, 2015 11:52 AM
To: Nijhawan, Amit@DOT
Cc: AAAKevin
Subject: RE: EA 04-3J160-Son-116-PM 13.7-Request for quote on non-potable water

Amit,

I spoke with a Field Supervisor (Jack) who advised that you would likely be borrowing our hydrant meter for this project. Assuming that water is used in a one-month timeframe the approximate cost to use our hydrant meter would be:

Base Rate (\$50/month)	\$ 50.00
Water Usage Charge (\$4/unit)	<u>\$278.08</u>
(52,000 gals/748 gals/unit = 69.52 units)	

TOTAL COST*: **\$328.08**

*** In addition to the water/base rate charges, the contractor would be required to post a \$900 hydrant meter deposit with us, refunded when the meter is returned at the end of the project. Actual costs will depend on the length of time you have the meter and the actual water used according the hydrant meter read.**

The contractor would work with our Field Manager, Kevin Gilman, to pick up the hydrant meter and arrange a location to pull water.

Sincerely,

Julie Kenny
Administrative Manager
Sweetwater Springs Water District
(707) 869-4000

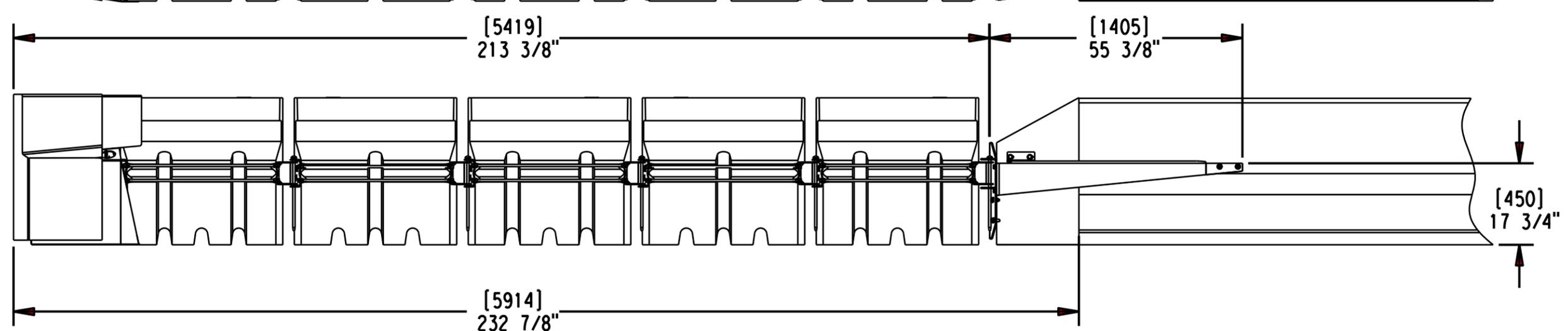
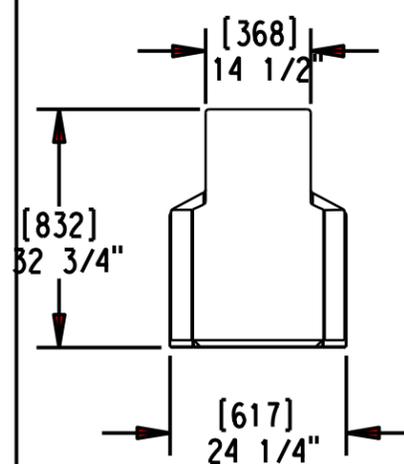
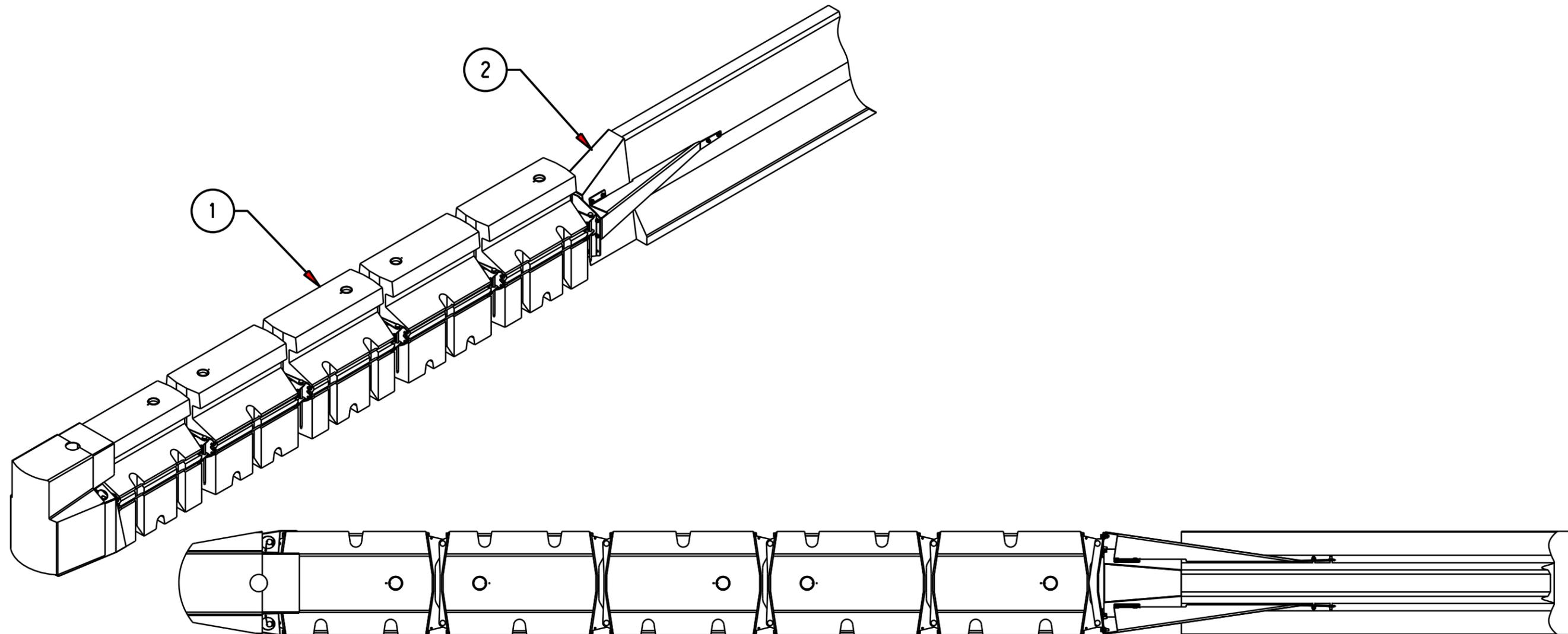
From: Nijhawan, Amit@DOT [<mailto:amit.nijhawan@dot.ca.gov>]
Sent: Friday, April 24, 2015 9:59 AM
To: sws@monitor.net
Cc: Childress, James J@DOT; Ramirez, Arthur A@DOT
Subject: EA 04-3J160-Son-116-PM 13.7-Request for quote on non-potable water

Hello Julie,

Per our conversation on phone this morning, please provide a quote for non-potable water for a project on Rte 116 at Pocket Creek. This project will require total estimated non-potable water of 52,500 gallon. Your prompt response will be appreciated.

Thanks

Amit Nijhawan, PE
Design 1, Branch M
Ph. (559) 243-3811
Fax. (559) 243-3840

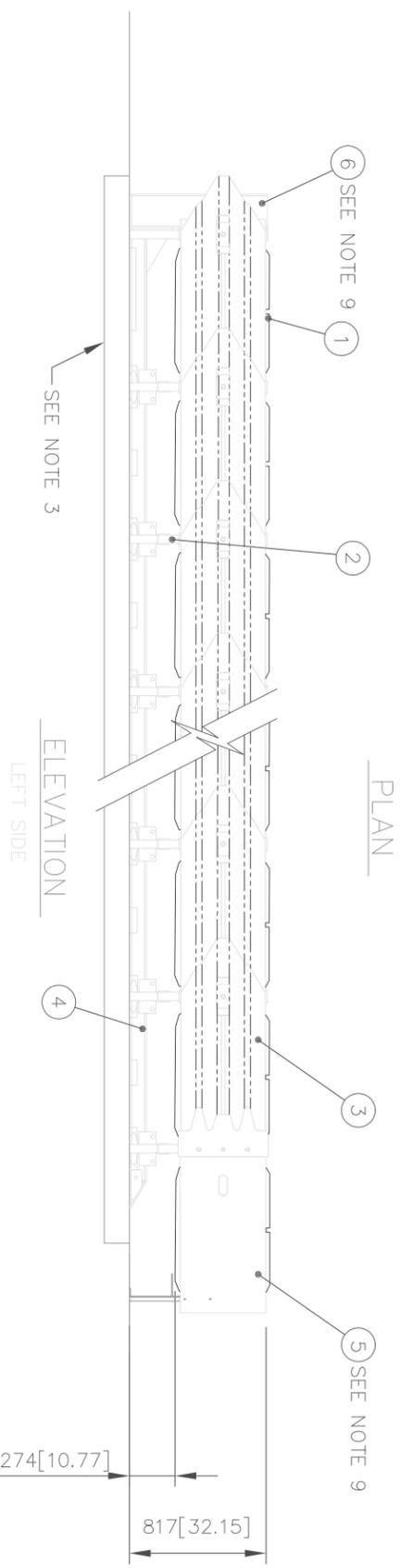
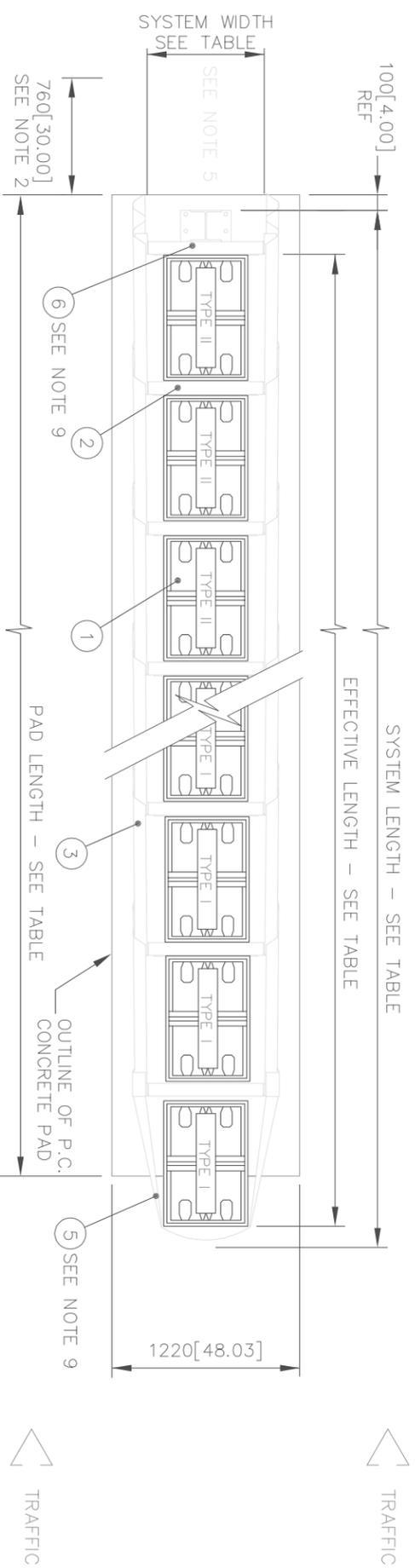


NOTE:
THICKNESS OF WELD TO BE EQUAL TO THE THINNER OF 2 PIECES BEING JOINED. WELD TO BE ALL AROUND UNLESS OTHERWISE SPECIFIED

© 2005 Barrier Systems Inc.						
The information hereon is proprietary to Barrier Systems Inc. shall not be disclosed, duplicated or used otherwise without the express written approval of Barrier Systems Inc.						
REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM

SCALE: 1:25			Standard Tolerance		
DRAWN BY: 6/06/05			Angular +/- 1/2 Deg.		
DATE: 6/06/05			Fractional +/- 1/16		
INIT.: CMB			Dec. XXX +/- .010		
GAD			Dec. .XX +/- .030		
TITLE: AB350 70km SYSTEM, PCB, TL-2					

MODEL	DRAWING NUMBER	REV
	AB070 PSB	



BAYS	MODEL#	WIDTH	DEPTH	SYSTEM LENGTH	EFFECTIVE LENGTH	PAD LENGTH	MAX DESIGN SPEED	# OF CARTRIDGES
		ft-in	ft-in	m	m	ft-in	km/h [MPH]	TYPE I
1	QZ2403*	762[30]	914[36]	4.00 [13'-1"]	3.56 [11'-8"]	4.57 [15'-0"]	70 [44]	3
2	QZ2404*	QZ3003*	QZ3603*	4.90 [16'-1"]	4.47 [14'-8"]	4.57 [15'-0"]	80 [50]	3
3	QZ2405*	QZ3004*	QZ3604*	5.82 [19'-1"]	5.38 [17'-8"]	5.49 [18'-0"]	90 [56]	2
4	QZ2406*	QZ3006*	QZ3606*	6.74 [22'-1"]	6.30 [20'-8"]	6.40 [21'-0"]	100 [62]	4
5	QZ2407*	QZ3007*	QZ3607*	7.65 [25'-1"]	7.21 [23'-8"]	7.32 [24'-0"]	110 [65]	4
6	QZ2408*	QZ3008*	QZ3608*	8.56 [28'-1"]	8.13 [26'-8"]	8.23 [27'-0"]	110 [68]	5
7	QZ2409*	QZ3009*	QZ3609*	9.48 [31'-1"]	9.04 [29'-8"]	9.14 [30'-0"]	115 [71]	6

* G = GREY or Y = YELLOW

- NOTES:
- IN COMPLIANCE WITH THE AASHTO 2002 ROADSIDE DESIGN GUIDE, MANUFACTURER RECOMMENDS REMOVAL OF ALL CURBS AND ISLANDS TO ENSURE PROPER IMPACT PERFORMANCE.
 - PROVISION SHALL BE MADE FOR REAR FENDER PANELS TO SLIDE REARWARD UPON IMPACT 760 [30.00] MIN.
 - CAUTION: THE QUADGUARD C.Z. MUST BE CORRECTLY ANCHORED FOR PROPER IMPACT PERFORMANCE.
ATTACH SYSTEM USING ONE OF THE FOLLOWING:
 a) 7" STUDS MAY BE USED TO ATTACH SYSTEM TO 28 MPa[4000 PSI] MIN. P.C. CONCRETE PER THE FOLLOWING MINIMUMS:
 a) 150[6.00] NON REINFORCED ROADWAY OR PAD
 b) 200[8.00] REINFORCED PORTABLE PAD PER THE REFERENCE DETAIL c) 180[7.00] DECK STRUCTURE
 d) 18" THREADED RODS MAY BE USED TO INSTALL SYSTEM ON ASPHALT.**
 **REFER TO THE QUADGUARD C.Z. MP-3 ANCHORING SYSTEM INSTALLATION INSTRUCTIONS FOR SPECIFICATIONS.
 - SEE THE "QUADGUARD SYSTEM PRODUCT MANUAL", FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. INFORMATION AND COPIES OF ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DEPARTMENT AT (888) 323-6374.
 - WHERE NECESSARY, THE CUSTOMER SHALL SUPPLY A TRANSITION FROM THE QUADGUARD SYSTEM TO THE OBJECT BEING SHIELDED.
 - UNITS OF MEASUREMENT ARE MILLIMETERS [INCHES] UNLESS OTHERWISE NOTED.
 - THE NUMBER OF BAYS INDICATED IN THE TABLE IS BASED ON CALCULATED VALUES TO ENSURE ADEQUATE SYSTEM CAPACITY TO DISSIPATE THE LONGITUDINAL IMPACT ENERGY OF A 2000 kg VEHICLE TRAVELING AT THE SPEED INDICATED.
 - THE SIX BAY SYSTEM HAS BEEN FULLY TESTED AT 100 km/h UNDER THE FULL 8 TEST MATRIX OF NCHRP 350 TL-3. SYSTEMS LONGER THAN SIX BAYS SHALL ALSO BE CAPABLE OF MEETING THE OCCUPANT RISK CRITERIA AS RECOMMENDED IN NCHRP 350 FOR VEHICLES WEIGHING 2000 kg IMPACTING HEAD ON AT THE SPEED INDICATED IN THE TABLE.
 - NOSE ASSEMBLY NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.

REFERENCES

- QUADGUARD CARTRIDGE
- DIAPHRAGM
- FENDER PANEL
- MONORAIL
- NOSE ASSEMBLY
- C.Z. BACKUP

Revisions	Date	Rev.	By	Ckd. App.
ITEM 5 "DOT" WAS IN WRONG PLACE	7/25/00	N	STT	KM
REVISED TO SHOW NOSE BELT	5/14/99	L	DLS	BB
ADDED NOTES 8 AND 9.	12/3/99	M	DK	DO

DESIGNED:	DATE:
S. TRACESER	06/14/96
CHECKED:	DATE:
JVM/MHO	03/01/96
APPROVED:	DATE:
J. MACHADO	06/17/96
DATE:	06/17/96
CAD FILE:	QSCZCVR-U.dwg

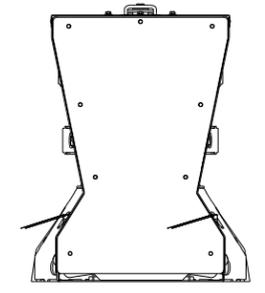
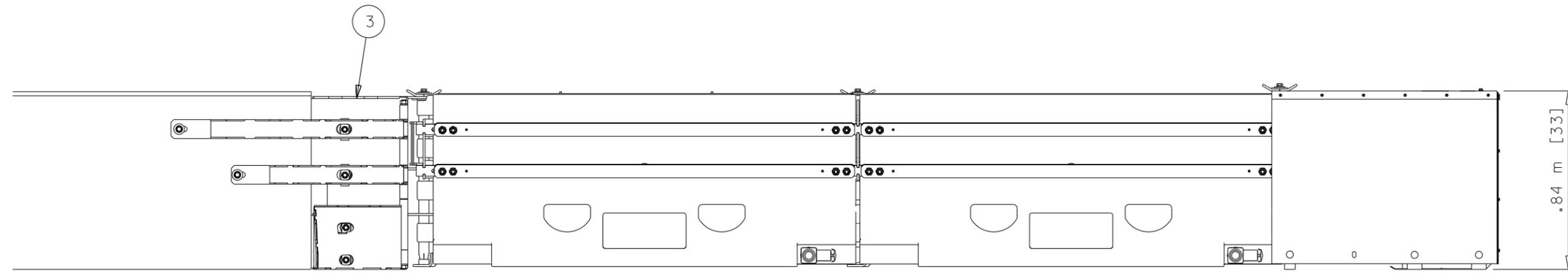
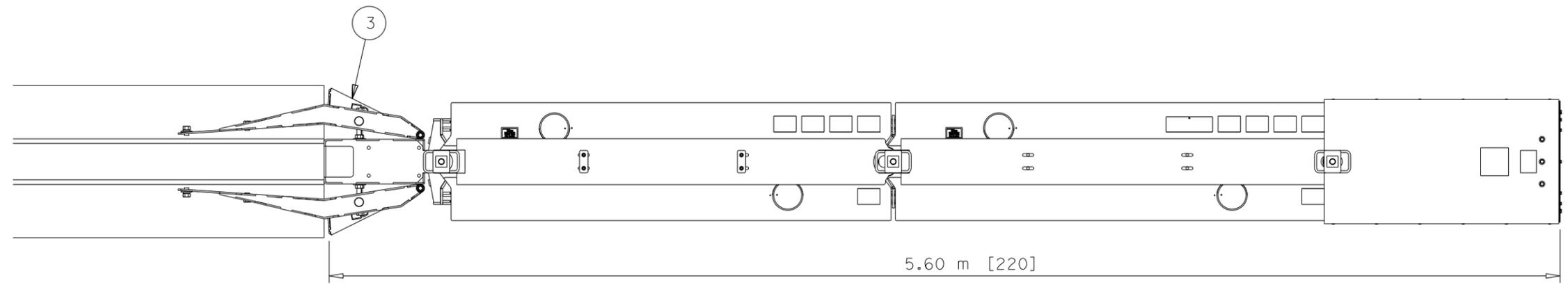
ENERGY ABSORPTION SYSTEMS
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® C.Z. SYSTEM
FOR CONSTRUCTION ZONES

SCALE 1=40 DWG. QSCZCVR-U SHEET 1 OF 1 REV N

PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	617871B	BAY ASSY,ACZ-350,TL-2	1
** 2	NOSE	NOSE ASSY,*,ACZ-350	1
3	617872B	TRANSITION ASSY,UNIV,PCMB,ACZ-350	1
** 4	TRANS ADAPTER	TRANSITION ADAPTER ASSY,*,ACZ-350	1

** VARIES DEPENDING ON SITE



- NOTES:
1. THE DICTED ACZ-350 WITH TRANSITION IS A NARROW, NON-REDIRECTIVE, GATING CRASH CUSHION. IT HAS BEEN CRASH TESTED FOLLOWING THE GUIDELINES IN NCHRP 350 TL-2 (70 km/h). IT'S IMPACT PERFORMANCE IS SIMILAR TO A SAND-FILLED INERTIAL BARREL ARRAY. AS A CONSEQUENCE, CARE MUST BE USED IN IT'S APPLICATION IN THE FIELD. THE ACZ-350 CAN BE USED TO PROTECT PORTABLE (UNANCHORED) OR PERMANENT (ANCHORED) CONCRETE BARRIER AT SITES WHERE THE CHANCE OF HIGH ANGLE, HIGH SPEED IMPACTS IS LOW. WHEN THESE TYPES OF ANGLED IMPACTS MAY OCCUR, A REDIRECTIVE CRASH CUSHION, SUCH AS THE QUADGUARD SYSTEM, SHOULD BE CONSIDERED.
 2. SEE THE ACZ-350 MANUAL FOR A DESCRIPTION OF ITS IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS BEFORE PLACING A SYSTEM AT A GIVEN SITE. IMFORMATION AND ADDITIONAL COPIES OF THE ABOVE MANUAL ARE AVAILABLE BY CALLING CUSTOMER SERVICE DPARTMENT AT (312) 467-6750 OR (888) 323-6374.

R E F E R E N C E S

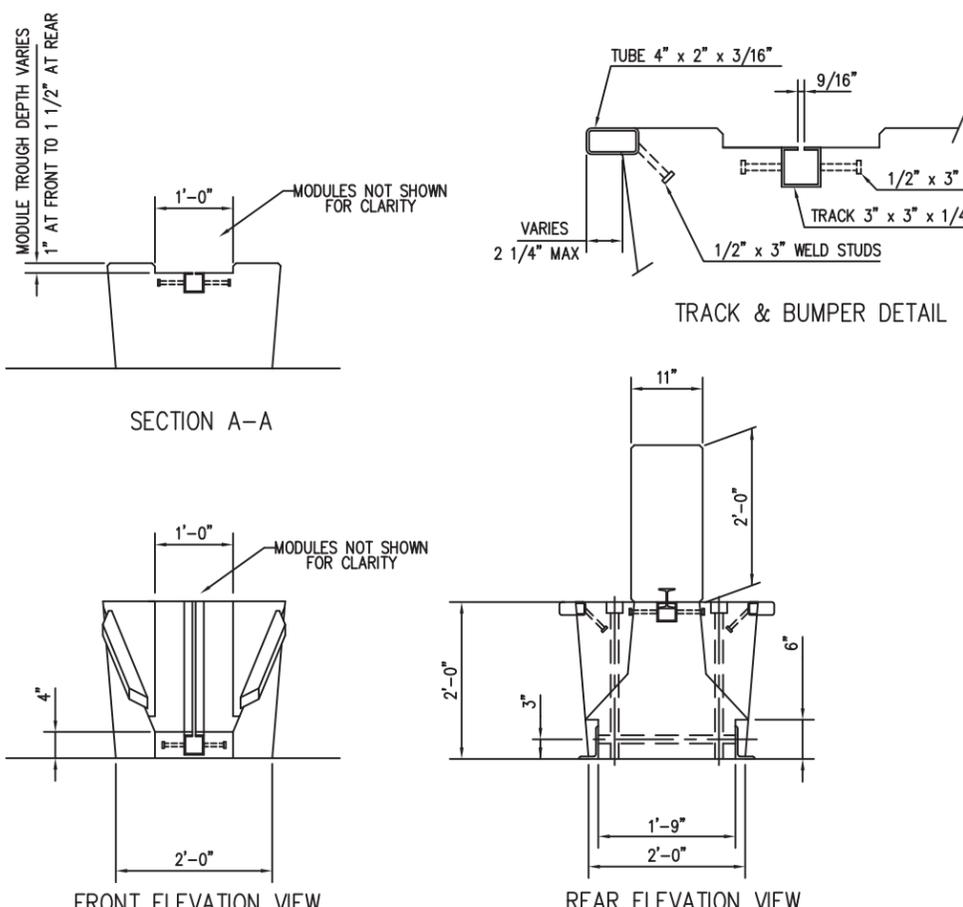
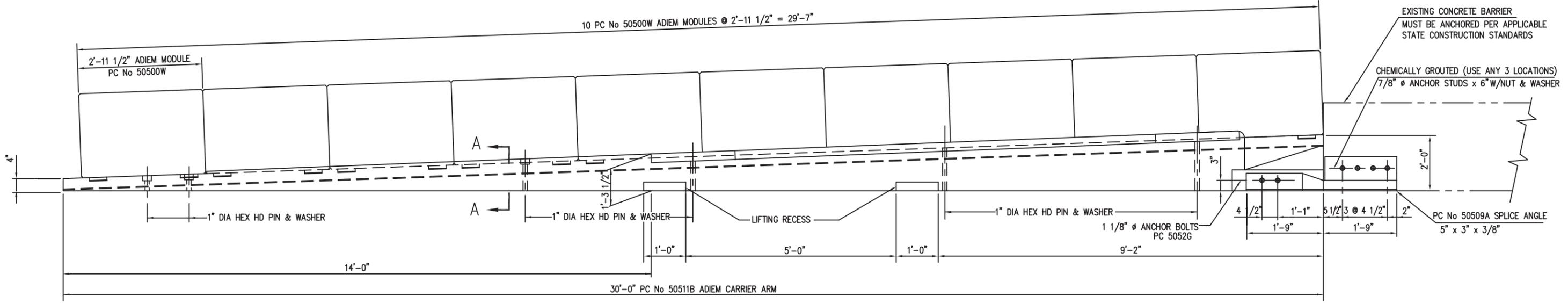
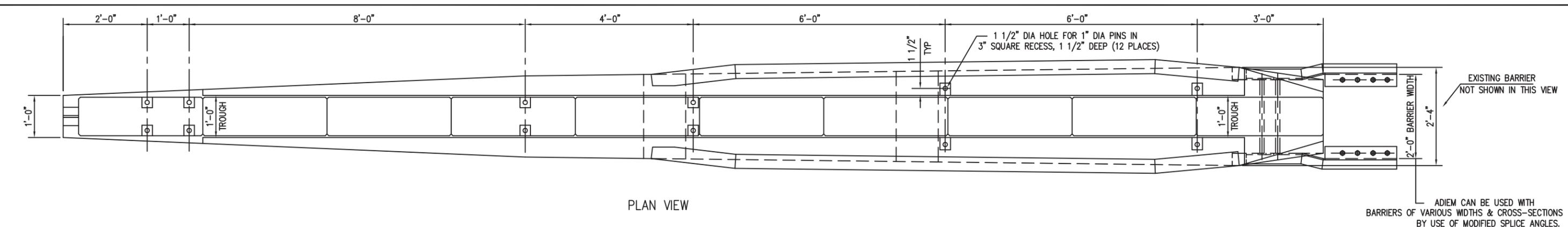
BAY ASSEMBLY: 617871
 NOSE ASSEMBLY: 611517
 TRANSITION ASSY: 617872
 TRANSITION ADAPTER: _____

DRAWN:	D. Hayes Jr	DATE:	11/2/2010
DESIGNED:	S. Thompson	DATE:	7/26/2010
CHECKED:	K. Mortensen	DATE:	11/18/2010
APPROVED:	S. Trageser	DATE:	11/19/2010

Contract No. 04-1J3204
 146
 ACZ-350 SYS TL-2.idw

ACZ-350TM SYSTEM, TL-2

Revision	Date	Rev	By	Chk.	App.



BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION	REMARKS
50500W	10	MODULES x 2'-11 1/2"	
50511B	1	BASE x 30'-0"	
50508A	1	SPLICE ANGLE x 3'-6" RT	
50509A	1	SPLICE ANGLE x 3'-6" LT	
6549W	1	GARNA-THANE COATING (1 GAL)	
5052G	2	1 1/8" ϕ x 25" HEX HD BOLT	
4963G	4	1 1/8" WASHER	
3976G	2	1 1/8" HEX NUT	
4616G	6	7/8" ϕ STUD x 6" (FULL THD)	
3725G	6	7/8" WASHER	
3735G	6	7/8" HEX NUT	
★ 5206B	1	ADHESIVE HY150 CARTRIDGE	
3900G	12	1" WASHER	

- ADIEM INSTALLATION INSTRUCTIONS**
- The ADIEM base is to be placed on a smooth surface (the same horizontal plane as the concrete barrier) and parallel to the mainline or ramp traveled lane(s).
 - Install anchor rods for ADIEM base by driving in soil or soft asphalt or driving in pre-drilled holes for hard asphalt or concrete (no epoxy required). The base should not be moved after the holes are drilled. The holes should be drilled using, at a minimum, a 35# hammer and minimum 36 inch long drill bit. (A 50# hammer is recommended.)
 - Attach connection brackets to base with two (2) 1 1/8" X 25" hex head bolts provided. Then field drill holes in the existing barrier and attach connection brackets to it with chemically grouted hardware provided.
 - Oil the ADIEM base track. Slide the modules onto the base. Be careful not to damage edges of the modules while sliding onto the base.
 - If the modules are scuffed or nicked, apply GARNA-THANE coating to the affected area.
 - Recommended tools and equipment:

OPTIONAL ANCHOR ITEMS

PRODUCT CODE	DESCRIPTION
5205B	ADHESIVE DISPENSER
5207B	MIXER HIT HY150 (NOZZLE)
5208B	FILLER HIT HY150 (FILLER TUBE)
5209B	BIT TE-C+ 11/16-18 (11/16" ϕ BIT)

- ★ EACH CARTRIDGE INCLUDES 1 EACH : MIXER HY 150 CARTRIDGE (NOZZLE)
: FILLER HIT HY 150 (FILLER TUBE)

- NOTES:**
- ANCHOR PINS ARE 1" DIA HEX HD, POINTED, GALV RODS (A307)
 - PORTLAND CEMENT CONCRETE (PCC)
 - ASPHALTIC CONCRETE (ACP)
 - BASE AND/OR COMPACTED SOIL (BASE)
 - ADIEM INSTALLATION NOT RECOMMENDED ON LOOSE SOIL.

This drawing and the information shown thereon is the sole property of TRINITY INDUSTRIES, INC. Neither the drawing nor such information is to be used for any purpose other than that for which it was specifically furnished by TRINITY INDUSTRIES, INC., nor is any reproduction authorized without written permission.

- ALTERNATE ADIEM INSTALLATION INSTRUCTIONS**
- At a holding site, the modules are slid into the ADIEM base after oiling the base track. Be careful not to damage the edges of the modules while sliding them onto the base.
 - If the modules are scuffed or nicked, apply GARNA-THANE coating to the affected area.
 - The unit is then delivered to the job site. The unit is to be placed on a smooth surface (the same horizontal slope as the concrete barrier) and parallel to the mainline or ramp traveled lane (s).
 - The front module should be removed so the remaining modules can be shifted for easy access for drilling the anchor rod holes.
 - Install anchor rods for ADIEM base by driving in soil or soft asphalt or driving in predrilled holes for hard asphalt or concrete (no epoxy required). The base should not be moved after the holes are drilled. The holes should be drilled using, at a minimum, a 35# hammer and a minimum 36 inch long drilling bit. (A 50# hammer is recommended.)
 - Attach connection brackets to base with two (2) 1 1/8" X 25" hex head bolts provided. Then field drill holes in the existing barrier and attach connection brackets to it with chemically grouted hardware provided.

REV.	CHK'D	BY	DATE	REMARKS
6	B.T.	L.H.	12/10/03	REPLACED GROUT WITH HILTI, UPDATED DWG
5		L.H.	03/12/03	DELETED NOTE #7, REVISED NOTE #3
4	D.D.	L.H.	12/17/99	REVISED COATING, CHANGED TITLE BLOCK
3		BT	3-14-97	DELETED PC 5484, ADDED PC 5052, CHG QTY PC 3976
2		BT	2-14-97	GENERAL UPDATES

ERECTION DETAILS

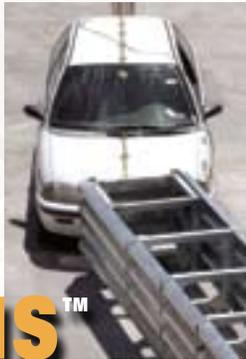
TRINITY INDUSTRIES, INC.
HIGHWAY SAFETY PRODUCTS
2525 STEMMONS FREEWAY, DALLAS, TX 75207

DRAWN	B.TAKACH
CHECKED	D.D.
APPROVED	
DATE	3/19/96
ENG. FILE #	SS349-01E
SHT.No.	E1 OF 1
DRAWING NO.	SS 349
REV.	6



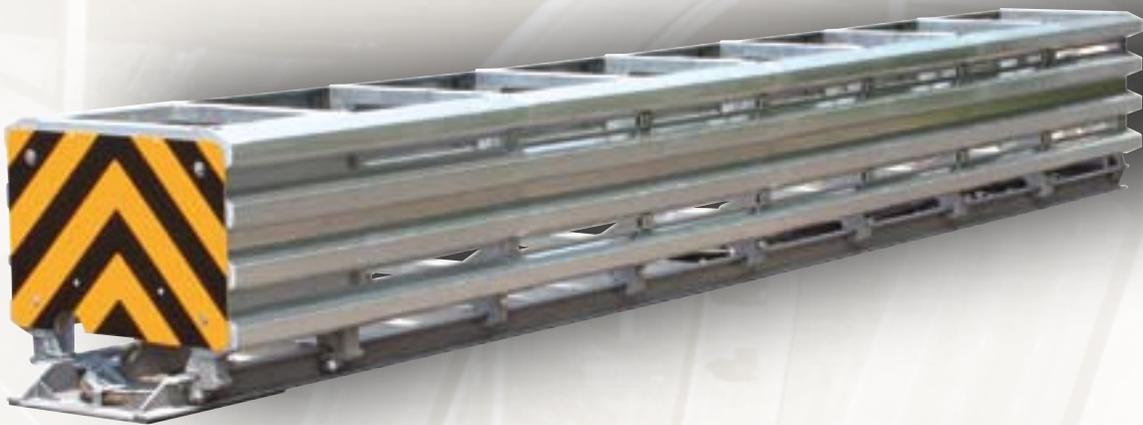
SCI Products Inc.

**The World's Only
Speed-Dependent
Crash Attenuators.**



SMART CUSHION INNOVATIONS™

NCHRP 350 Approved



Marketed and Distributed by

Work Area Protection

Contract No. 04-1J3204

148

SMART CUSHION INNOVATIONS™

The World's Only Speed-Dependent Crash Attenuators



The Smart Cushion Innovations (SCI) crash attenuator is a revolutionary, speed-dependent product that varies stopping resistance during an impact. The Smart Cushion Innovations (SCI) crash attenuator allows lighter and slower-moving vehicles to have longer ridedown distances and lower ridedown G forces.

Unlike fixed-resistance attenuators, the Smart Cushion Innovations (SCI) attenuator does not reach maximum stopping resistance unless a vehicle is traveling at the maximum design speed. This fully redirective, non-gating, bi-directional, impact attenuator was designed for maximum safety and reusability, as well as outstanding durability before, during and after an impact.

The SCI is the only attenuator with a reverse-tapered design to eliminate side panel stress during a collapse. It also has an extremely low angle of exit on side impacts ($<1^\circ$) to keep vehicles from rebounding back into traffic and causing secondary accidents. This is the lowest angle of exit for any redirective attenuator on the market.



How It Works

The hydraulic porting of the attenuator ensures that the proper resistance is used to stop the vehicle before it reaches the end of the cushion's usable length.

The SCI was specifically designed for durability and resetability to enable resets to be performed in less than one hour. After a frontal impact, an experienced crew can perform the two-stage reset in less than 45 minutes. Side impacts within NCHRP 350 specifications should not damage the attenuator.

After an impact, the cushion requires a dual-stage pull-out with the replacement of two 1/4" shear bolts. The crash attenuator requires a minimal inventory of spare parts because of the new side panels' durability and the normal requirement of only two shear bolts on the frontal impact reset. Minimal damage means quick resetting and reduced worker exposure to traffic, as well as lower costs for traffic control, replacement parts and labor.



Ready To Install

SCI attenuators come fully assembled for a pick-and-set install. A typical installation can be performed in less than 1-1/2 hours. The units require no backstops for permanent or temporary construction applications.

NCHRP 350 Test Results

All NCHRP 350 tests were performed on the same unit in four consecutive days. All tests showed outstanding results for ridedown G forces and low angle of exit. There were no replacement parts required prior to the next test except for shear bolts.

"It's a very easy installation. We set the SCI impact attenuator with a truck-mounted crane, drove into the concrete surfacing and then did some epoxy work. The installation went real well and took about an hour. It would normally take longer for a different type of system. SCI manufactures a quality product and I'm sure they save many



Repair Costs

Based on NCHRP 350 Test results, the **SCI100GM** required the following parts and labor:

NCHRP 350 TEST LEVEL III REPAIR RESULTS	Part Names	Cost	Repair Hrs.	Cost	Total Cost
#3-31 2000 kg vehicle 0 degree frontal impact at 102 km/h	2 – Shear Bolts	\$1	2 man hours	\$80	\$81
#3-32 820 kg vehicle 15 degree frontal impact at 101 km/h	2 - Shear Bolts	\$1	2 man hours	\$80	\$81
#3-33 2000 kg vehicle 15 degree frontal impact at 101 km/h	2 - Shear Bolts	\$1	2 man hours	\$80	\$81
#3-37 2000 kg vehicle 20 degree side impact at 99 km/h	0	\$0	0	\$0	\$0
#3-39 2000 kg vehicle 20 degree rev. side impact at 99 km/h	0	\$0	0	\$0	\$0

Test Levels Available

The **SCI70GM** is our Test Level 2 (45 MPH) attenuator and the **SCI100GM** is our Test Level 3 (62 MPH) attenuator. Both attenuators can protect a wide range of hazards including bridges, median barriers and highway signs.

reusability.

The first speed-dependent, variable-resistance attenuator that can ramp resistance up or down to provide the smoothest ride down of any system on the market.



*"The **SCI100GM** unit has experienced three hits in a very short period. The first was well above the NCHRP 350 criteria. The crash used every bit of the capacity the unit has and I believe the driver survived because of the performance of the unit in extreme circumstances. The next two hits were within the NCHRP 350 criteria and the unit functioned as designed with very little repair cost. As we gain experience in resetting units, the job can be accomplished in less than 30 minutes for a majority of hits. Damage to the unit for the last two hits was limited to the shear pins and the chevron plate."*

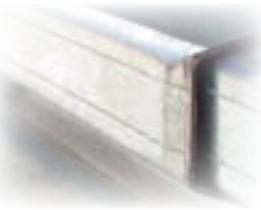
Don Jones, Trafficade Services Inc., Phoenix, Arizona

Features



Support Gussets.

Gussets located behind the panels reduce gap formation and deformation to prevent snagging on reverse side impacts.



Stronger Side Panel.

Our panels are over 90% stronger than curved profiles. The profile allows the edges to be beveled, reducing the potential for snagging and damage on reverse-direction impacts. The panel also smoothly redirects vehicles on side impacts. The side panel is fabricated from 10-gauge, 60-ksi, minimum-yield steel with a G90 galvanized coating.



Cable & Cylinder System.

This system allows longer ridedown distances for smaller vehicles, as well as smoother ridedown with lower G forces for all vehicles. The cylinder's hydraulic porting assures a controlled ridedown by applying the necessary resistance required based on the speed of the vehicle.



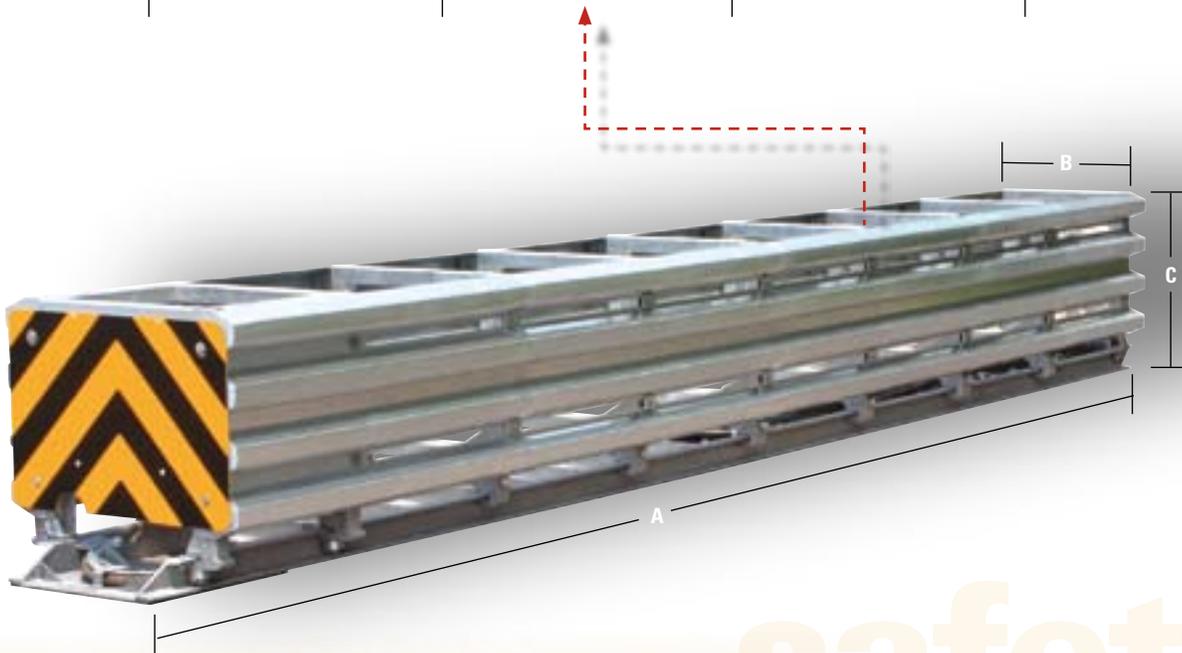
Side Guide Design.

This new design withstands side impacts with no damage. It also allows individual replacement of the support frames.



Front Rollers.

The roller guide design on the front sled produces a smooth, aligned collapse by reducing friction and binding.



SCI Dimensions	Test Level 2	Test Level 3
A	13' 6"	21' 6"
B	24"	24"
C	34"	34"
Weight	2470 lbs.	3450 lbs.

Weights are for attenuators only

safety.



SMART CUSHION INNOVATIONS™

Highlights

Safety Benefits

- ▶ Variable resistance (speed-dependent), not fixed resistance, provides consistent deceleration during ridedown.
- ▶ Longer ridedown distances and lower sustained G forces for lighter or slower-moving vehicles.
- ▶ Low angle of exit on side impacts (<1°) to keep vehicle from deflecting back into traffic.
- ▶ Quick and easy resetting for reduced worker exposure to traffic.
- ▶ Reduced out-of-service time to maximize highway safety.



Cost Benefits

- ▶ Minimal replacement parts requirement reduces spare parts inventory and parts costs.
- ▶ Quick, easy resetting reduces labor and traffic control costs.
- ▶ The new, reverse-tapered design eliminates side panel stress on frontal impacts to reduce damage and system fatigue from multiple impacts.
- ▶ Life cycle cost benefits increase dramatically as impacts occur.



About Work Area Protection Corporation

Work Area Protection Corporation is the international leader in traffic control devices and work zone safety products. Since 1969, we have been meeting customer needs and exceeding quality standards with a wide range of highway and construction safety products. We back those products with knowledgeable, personalized customer service and strong distributor support.

Part No.	Description	Weight
Attenuators		
9400	SCI100GM Attenuator 24" wide w/Concrete Anchors Test Level 3	3500 lbs.
9450	SCI100GM Attenuator 24" wide w/Asphalt Anchors Test Level 3	3575 lbs.
9451	SCI70GM Attenuator 24" wide w/Concrete Anchors Test Level 2	2500 lbs.
9452	SCI70GM Attenuator 24" wide w/Asphalt Anchors Test Level 2	2550 lbs.
Anchor Kits		
9401	Concrete Anchor Kit for SCI100GM	
9402	Asphalt Anchor Kit for SCI100GM	
9453	Concrete Anchor Kit for SCI70GM	
9454	Asphalt Anchor Kit for SCI70GM	
Accessories		
9406	Shear Bolt	
9424	Delineator Panel Yellow Test Level 3	
9456	Delineator Panel Yellow Test Level 2	
9439	Epoxy 22 oz. Cartridge Required for Attenuator Part No. 9400=4/9450=12/9451=3/9452=9	
9440	Nozzle Epoxy Mixing – 1 nozzle required per cartridge	
9444	Spare Parts Kit Test Level 3	
9458	Spare Parts Kit Test Level 2	
Transitions		
9431	Transition 24" Jersey Barrier - Right (viewed from front)	 Transition 24" Jersey Barrier
9432	Transition 24" Jersey Barrier - Left (viewed from front)	
9433	Transition 24" Concrete - Left & Right	

Call for other transition design availability

Transition 24" Concrete

Disclaimer

This product is only intended for use as a redirective impact attenuator. Installations must be performed strictly according to manufacturer's specifications. Improper installation, modification, or unintended use may create a hazardous condition that can cause personal injury, property damage or death. Any modification or unintended use of this product shall immediately void all manufacturers' warranties. SCI Products Inc. disclaims all liability for injuries to persons or property resulting from any modifications to, unintended use of or installation of this product other than in strict accordance with the manufacturer's specifications.

Designs are subject to change without notice.

SMART CUSHION INNOVATIONS is a trademark of SCI Products Inc.

US Patent No. 6,962,459

US Patent No. 7,018,130

US Patent No. 7,070,031

Other Patents Pending

Variable Message Boards • Attenuators • ITS Products • Channelizers • Advance Warners



Work Area Protection Corp.

P.O. Box 4087 • 2500 Production Drive • St. Charles, IL 60174-9081
 Phone: 630.377.9100 • Orders: 800.327.4417 • Fax: 630.377.9270
 Web: www.workareaprotection.com

Member ATSSA

Distributed by:

Contract No. 04-1J3204

153

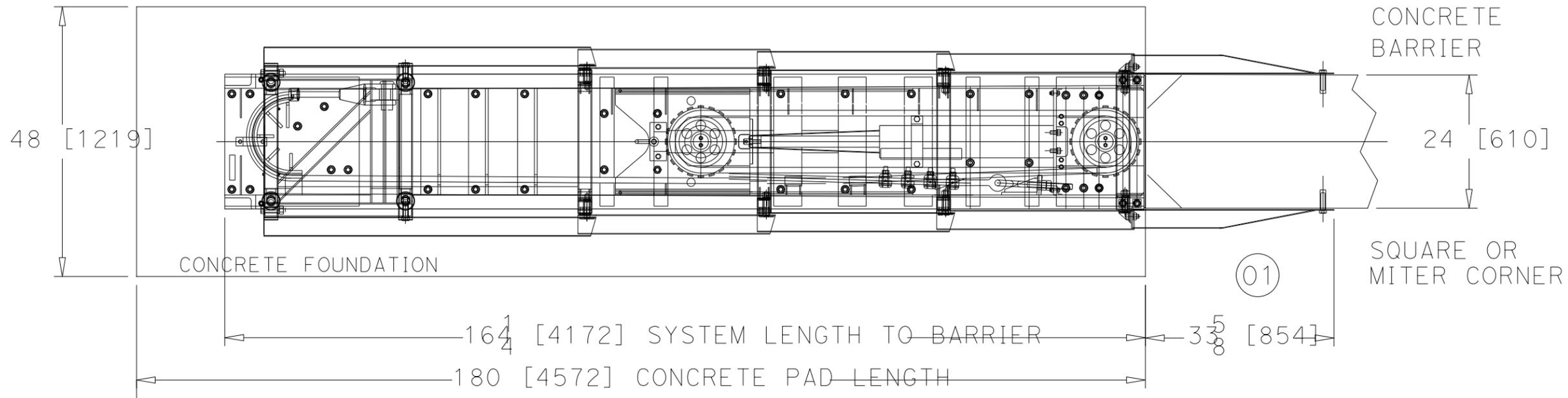
©2006 SCI Products Inc.

WAP 0606 ATT

Parts List:
01 - Transition 24" Concrete Block Right & Left

SMART CUSHION - TEST LEVEL II
SCI70GM

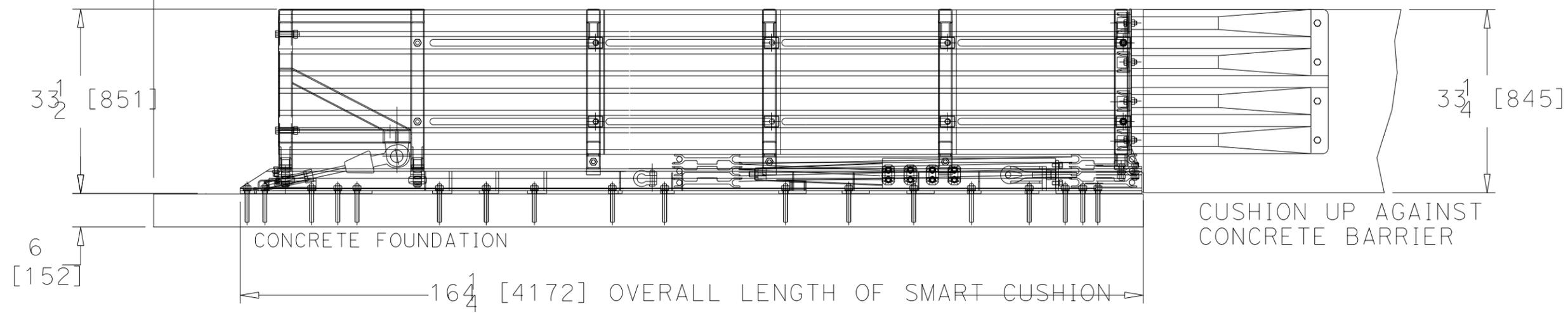
CONCRETE BLOCK, 24 INCH TRANSITION
ET-06-04
ONE OR BOTH SIDES AS REQUIRED



LEVEL II PLAN VIEW

SMART CUSHION - TEST LEVEL II
SCI70GM

CONCRETE BLOCK, 24 INCH TRANSITION
ET-06-04
ONE OR BOTH SIDES AS REQUIRED



LEVEL II ELEVATION

Contract No. 04-1J3204
154

REV.	#	0	4	3	5
DRAWING NO.	FILE:	DRAWN:	CHECKED:	DATE:	SHEET
PROJECT	END TREATMENT w/COMPLETE SYSTEM	LEVEL II SYSTEM COMP			CONCRETE BLOCK TRANSIT
CLIENT					CONCRETE BLOCK TRANSIT
COMMERCIAL TOLERANCES APPLY TO STOCK SIZES					TOLERANCES
					ANGLES
					ALL DIMENSIONS ARE INCHES UNLESS OTHERWISE NOTED
REVISIONS	DESCRIPTION	DATE	BY		
<p>635 HUNTERS ROAD, HARRISBURG, PA 17110-1635 717-234-8518 THIS DRAWING IS THE PROPERTY OF SCI PRODUCTS, INC. AND SHALL BE RETURNED UPON DEMAND. NO PART OF THIS DRAWING IS TO BE COPIED, REPRODUCED, OR TRANSMITTED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF SCI PRODUCTS, INC. NOR SHALL IT BE USED FOR ANY OTHER PROJECTS WITHOUT THE EXPRESS WRITTEN CONSENT OF SCI PRODUCTS, INC.</p>					