INFORMATION HANDOUT

For Contract No. 01-402814
At 01-Men-101-50.1/84.6

Identified by
Project ID 0114000126

PERMITS

United States Army Corps of Engineers

Non-Reporting Nationwide 404

WATER QUALITY

California Regional Water Quality Control Board

North Coast Region, WDID No. 1B0092WNME
with Amendment, dated May 4, 2016

AGREEMENTS

California Department of Fish and Wildlife

Notification No. 1600-2010-0296-R1
with Extension dated February 12, 2016

California Department of Fish and Wildlife

Notification No. 1600-2010-0296-R1

National Marine Fisheries Services

Tracking No. SWR 2012-9354

MATERIALS INFORMATION

Geotechnical Recommendation, PM 76.62

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

15 July 2016

Regulatory Division

Subject: File Number 2016-00060

Mr. Frank Demling
California Department of Transportation
1656 Union Street
Eureka, California 95501

Dear Mr. Demling:

This correspondence is in reference to your submittal of February 2, 2016, concerning Department of the Army (DA) authorization for the Highway 101 Mendocino County Culvert Rehabilitation Project. The project includes repair, upgrade, or replace existing drainage facilities at 29 locations along 34.11 miles of Route 101 between the towns of Willits and Leggett, in Mendocino County.

The proposed project includes construction of headwalls and inlet and outlet flared end sections, placing rock slope protection, rock energy dissipaters, and gabions, excavating inlet and outlet grades, grading ditches, clearing ditch vegetation, culvert repair and replacement, and constructing access roads and landings. Proposed actions also include the establishment of staging areas in upland areas, installation of temporary culverts to divert flow during construction, reconstructing embankments, and other activities. The facilities vary from simple overside drains that allow road run off to exit the highway, to large culverts that pass substantial bed-load in annual flowing watersheds.

Work within U.S. Army Corps of Engineers' (Corps) jurisdiction would include repair to 10 culvert locations identified as follows:

SITE LOCATIONS:

Culvert 5. PM 54.20: **450 mm (18 -inch) Corrugated Steel Pipe (CSP)** Remove portion of existing cross culvert, plug and abandon remaining portion of existing cross culvert, remove existing Drainage Inlet (DI) and place new Type G1 DI in turnout; install new 24 in APC cross-culvert at shallower grade and place Rock Slope Protection (RSP) at outlet.

Culvert 6. PM 57.54: **450 mm (18-inch) CSP** Place 16-inch Alternative Pipe Liner (APL).

Culvert 7. PM 57.58: **450 mm (18-inch) CSP** Place 16-inch APL.

Culvert 8. PM 57.63: **450 mm (18-inch) CSP** Place 16-inch APL.

Culvert 9. PM 58.59: **750 mm (30-inch) CSP** Extend existing culvert by placing a 6 feet 30-inch CSP at outlet end, place 28-inch APL, remove existing downdrain, place RSP at outlet..

Culvert 10. PM 58.82: **4200 mm (14 ft) x 2200 mm (86-inch) Concrete Arch** Remove concrete weir, invert pave double RCB, invert pave concrete apron at outlet.

Culvert 12. PM 66.50: **3200 mm (10.5 ft) x 2100 mm (7 ft) Double RCB** Install cable railing on inlet and outlet side, install Rock Fish Weir on outlet side, place RSP on inlet side.

Culvert 18. PM 79.79: **450 mm (18-inch) CSP** Abandon portion of existing 18-inch CSP, remove portion of existing 18-inch CSP and replace with a new 24-inch APC, remove existing headwall and replace with new straight concrete headwall.

Culvert 19. PM 79.88: **450 mm (18-inch) CSP** Remove existing CSP and replace with a new 24-inch APC, place a straight concrete headwall at the inlet.

Culvert 20. PM 81.30: **600 mm (24-inch) CSP** Remove existing 24-inch CSP and replace with a new 24-inch APC, remove existing flared end section and place a new straight concrete headwall at inlet.

Work will result in temporary impacts to 0.441 acre and permanent impacts to 0.0055 acre of waters of the U.S.

All work shall be completed in accordance with the plans and drawings titled "USACE File #2016-00060N, EA40281 Highway 101 Mendocino County Culvert Rehabilitation Project, Mendocino County," sheets 1 to 11, and dated July 15, 2016, 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 Jurisdictional Determination (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. While this preliminary jurisdictional determination was conducted pursuant to Regulatory Guidance Letter No. 08-02, *Jurisdictional Determinations*, it may be subject to future revision if new information or a change in field conditions becomes subsequently apparent. The basis for this preliminary jurisdictional determination is fully explained in the enclosed *Preliminary Jurisdictional Determination Form*, which has been signed and dated by this office. You are requested to sign and date this form and return it to this office within two weeks of receipt. Please see the enclosed Preliminary JD map titled, "Waters of the United States, Preliminary Jurisdictional Determination, EA 2A441 Highway 101 Mendocino County Culvert Rehabilitation Project, Mendocino County, California" and dated "July 15, 2016" (enclosure 2, Sheets 1 to 8).

Based on a review of the information in your submittal and the current condition of the site, as verified during a field investigation on February 24, 2016, the project qualifies for authorization under Department of the Army Nationwide Permit (NWP) 14 Linear Transportation, 77 Fed. Reg. 10,184 (Feb. 21, 2012) (enclosure 3), pursuant to Section 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 (http://www.spn.usace.army.mil/Portals/68/docs/regulatory/Nationwide/NWP_Gen_Cond.pdf), and the San Francisco District regional conditions cited on our website (http://www.spn.usace.army.mil/Portals/68/docs/regulatory/Nationwide/Reg_Cond.pdf). 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 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/Public-Notices.aspx). Upon completion of the project and all associated

mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 4, verifying that you have complied with the terms and conditions of the permit.

You shall comply with all terms and conditions set forth by "Water Quality Certification Number 1B10092WNME for California Department of Transportation Highway 101, Mendocino County Culvert Rehabilitation Project" issued by the North Coast Regional Water Quality Control Board on April 2, 2012 (enclosure 5). You shall consider such conditions to be an integral part of the NWP authorization for your project.

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 National Marine Fisheries Service (NMFS) to address project related impacts to listed species, pursuant to Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.). By letter of March 27, 2013, NMFS issued a BO (81420-2012-9354) cited in enclosure 6, with an incidental take statement for Southern Oregon Northern California Coast (SONCC) coho salmon Evolutionary Significant Unit (ESU), the threatened North Coast (NC) steelhead Distinct Population Segment (DPS), and the California Coastal (CC) Chinook salmon ESU.

General Condition 20 stipulates that any project affecting a historic property may not commence construction until the provisions of 33 C.F.R. pt. 325, Appendix C, have been satisfied. As the Federal lead agency for this project, Caltrans determined on January 25, 2016, that no historic properties are present at the Highway 101, Mendocino County Culvert Rehabilitation Project.

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

1. 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 Species shall be fully implemented as stipulated in the Biological Opinions entitled, "Reinitiation for the Repair of 11 Culverts Beneath State Route 101 in Mendocino County, California." (pages 24- 27) dated March 27, 2013 (enclosure 6). 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 a 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 (the Act).

2. Incidents where any individuals of fish listed by NOAA Fisheries under the Endangered Species Act appear to be injured or killed as a result of discharges of dredged or fill material into waters of the United States or structures or work in navigable waters of the United States authorized by this NWP shall be reported to NOAA Fisheries, Office of Protected Resources at (301) 713-1401 and the Regulatory Office of the San Francisco District of the U.S. Army Corps of Engineers at (415) 503-6795. The finder should leave the plant or animal alone, make note of any circumstances likely causing the death or injury, note the location and number of individuals involved and, if possible, take photographs. Adult animals should not be disturbed unless circumstances arise where they are obviously injured or killed by discharge exposure, or some unnatural cause. The finder may be asked to carry out instructions provided by NOAA Fisheries, Office of Protected Resources, to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.

You may refer any questions on this matter to Patricia K. Goodman of my Regulatory staff by telephone at 415-503-6776 or by e-mail at patricia.k.goodman@usace.army.mil. All correspondence should be addressed to the Regulatory Division, South Branch, 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://www.spn.usace.army.mil/Missions/Regulatory.aspx

Sincerely,

Digitally signed by COSTA.HOLLY.N.1249736780
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=COSTA.HOLLY.N.1249736780
Date: 2016.07.15 18:07:45 -07'00'

Holly N. Costa
Acting Chief, Regulatory Division

Enclosures

Copy Furnished (w/ encl 1 only):
CA NCRWQCB, Santa Rosa, CA
NMFS, Santa Rosa, CA

Nationwide Permit 14 - *Linear Transportation Projects*

Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project. This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 31.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Enclosure 4

Permittee: Mr. Frank Demling, California Department of Transportation

File Number: SPN 2016-00060

Certification of Compliance
for
Nationwide Permit

"I hereby certify that the work authorized by the above referenced File Number and all required mitigation have been completed in accordance with the terms and conditions of this Nationwide Permit authorization."

_____ _____
(Permittee) (Date)

Return to:

Patricia K. Goodman
U.S. Army, Corps of Engineers
San Francisco District
Regulatory Division, CESPN-R-S
1455 Market Street
San Francisco, CA 94103-1398

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

North Coast Regional Water Quality Control Board

May 4, 2016

California Department of Transportation
Attn: Mr. Frank Demling
1656 Union Street
Eureka, CA 95501

Dear Mr. Demling:

Subject: Amendment to the Federal Clean Water Act, Section 401, Water Quality Certification for the Mendocino County Culvert Rehabilitation Project

Files: CDOT HWY 101 Mendocino Culvert Rehabilitation Project
ECM PIN CW- 756174, WDID No. 1B10092WNME
Caltrans EA No. 01-40280

On March 3, 2016, we received your email requesting an amendment to the April 2, 2012, Federal Clean Water Act, Section 401, Water Quality Certification (certification) for the Mendocino Culvert Rehabilitation Project (Project).

In response to your request, this letter serves as an amendment to Finding 5, Condition 24, and Condition 29 of the certification, modifying the project description, as outlined below:

Finding 5: All project activities will only be conducted between May 15 and October 15 and are anticipated to take 80 days to complete. Work within waters of the U.S will only be conducted between June 15 and October 15. Caltrans' contractor will be required to implement Best Management Practices (BMPs) for construction and post-construction phases of the project to provide erosion and sediment control and pollution prevention throughout the project area. All graded areas within the project affected by the construction activities will be appropriately stabilized and BMPs will be implemented to ensure erosion and potential pollution is minimized and controlled.

Condition 24: Caltrans shall perform on-site and off-site mitigation actions in accordance with the Mitigation and Monitoring Plan Summary, dated April 2010. Compensatory mitigation for permanent impacts consists of enhancing 0.063 acre of riparian woodland along Long Valley Creek and 0.044 acre of upland buffer. On-site impacts to 0.042 acres wetlands shall be restored immediately after construction. As-built plans shall be developed for all the mitigation sites (temporary and permanent) within 30-days following their construction. In addition, Caltrans shall construct weirs and improve fish passage and enhance fish habitat condition and connectivity within Ten Mile Creek adjacent to the crossing at Highway 101(PM 66.50). The off-site mitigation actions and fish passage project shall be completed by November 2017; annual mitigation reports are due annually on December 31, with the first report due December 31, 2018.

Condition 29: The authorization of this certification for any dredge and fill activities expires on November 30, 2017. 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.

I hereby issue an amendment to the project description in Finding 5, Condition 24, and Condition 29 of the certification for the Mendocino Culvert Rehabilitation Project (WDID No. 1B10092WNME) certifying that the remainder of the Water Quality Certification sections of the April 2, 2012, Order are still valid.

If you have any questions or comments, please contact Brandon Stevens at (707) 576-2377 or at Brandon.Stevens@waterboards.ca.gov.

Sincerely,

Fred Blatt
for
Fred Blatt
2016.05.04
15:38:56 -07'00'
Water Boards

Matthias St. John
Executive Officer

160504_BDS_dp_MEN101_Culvert_Replacement_401Amend

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

North Coast Regional Water Quality Control Board

April 2, 2012

In the Matter of

Water Quality Certification

for the

California Department of Transportation
Highway 101, Mendocino County Culvert Rehabilitation Project
WDID No. 1B10092WNME

APPLICANT:	California Department of Transportation
RECEIVING WATER:	Wetlands and intermittent, ephemeral and perennial streams
HYDROLOGIC AREA:	Eel River Hydrologic Unit No.111.00
COUNTY:	Mendocino
FILE NAME:	CDOT - HWY 101 Mendocino Culvert Rehabilitation Project WDID No. 1B10092WNME

BY THE EXECUTIVE OFFICER:

1. On September 7, 2010, 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 (CWA), section 401, Water Quality Certification for activities related to proposed Highway 101, Mendocino County Culvert Rehabilitation Project (Project). Additional information was received August 16, 2010 and project design change information was submitted on September 19, 2011, and November 15, 2011. The proposed project will cause disturbances to waters of the United States (U.S.) and waters of the State associated with intermittent and ephemeral drainages, wetlands, streams and riparian areas that are located within the Eel River Hydrologic Unit No.111.00 (Outlet Creek Hydrologic Sub-Area No.111.61, Laytonville Hydrologic Sub-Area No.111.33, Benbow Hydrologic Sub-Area No.111.32). The Regional Water Board provided public notice of the application pursuant to title 23, California Code of Regulations,

section 3858 on November 30, 2011, and posted information describing the project on the Regional Water Board's website. No comments were received.

2. Caltrans is proposing to rehabilitate culverts at 28 locations along U.S. Highway 101 between Post Mile (PM) 50.18 and PM 84.52, between Willits and Leggett in Mendocino County, California. The proposed project includes construction of headwalls and inlet and outlet flared end sections, placing rock slope protection, rock energy dissipaters, and gabions, excavating inlet and outlet grades, grading ditches, clearing ditch vegetation, culvert repair and replacement, and constructing access roads and landings. Proposed actions also include the establishment of staging areas in upland areas, installation of temporary culverts to divert flow during construction, reconstructing embankments, and other activities.

3. Caltrans has determined that the total project permanent impacts to ephemeral drainages, intermittent streams, and perennial streams identified as other waters of the U.S. will be approximately 0.0133 acres (89 linear feet). The temporary project impacts to ephemeral drainages, intermittent streams, and perennial streams, and wetlands identified as other waters of the U.S. will be approximately 0.5598 acres (274 linear feet).

4. To mitigate the project's temporary impacts, Caltrans proposes that all areas temporarily disturbed during construction will be contoured to match preconstruction topography and grades, if appropriate, and planted and seeded to promote the restoration of pre-project functions and conditions. Permanently impacted areas are expected to comprise 0.0133 acre of jurisdictional "other waters" and 0.0023 acre of riparian habitat. Compensatory mitigation for permanent impacts on habitat consists of enhancing 0.063 acre of riparian woodland along Long Valley Creek and 0.044 acre of upland buffer. In addition, Caltrans proposes work within Ten Mile Creek adjacent to the crossing at Highway 101(PM 66.50) to construct weirs and improve fish passage and enhance fish habitat condition and connectivity.

5. All project activities will only be conducted between May 15th and October 15th and are anticipated to take 189 days to complete. Work within waters of the U.S will only be conducted between June 15 and October 15). Caltrans' contractor will be required to implement Best Management Practices (BMPs) for construction and post-construction phases of the project to provide erosion and sediment control and pollution prevention throughout the project area. All graded areas within the project affected by the construction activities will be appropriately stabilized and BMPs will be implemented to ensure erosion and potential pollution is minimized and controlled.

6. Caltrans has applied for authorization from the Unites States Army Corps of Engineers to perform the project under their Nationwide Permit No. 14 (linear transportation projects) pursuant to Clean Water Act, section 404. In addition,

Caltrans has applied for a 1602 Lake and Streambed Alteration Agreement from the California Department of Fish and Game. On August 12, 2009, Caltrans, acting as lead agency, certified a Focused Initial Study with Proposed Negative Declaration for the proposed project in order to comply with the California Environmental Quality Act (CEQA) (State Clearing House No. 2009042114). The Regional Water Board has considered the environmental document including any proposed changes, and incorporates any avoidance, minimization, and mitigation measures into the project as a condition of approval to avoid significant affects to the environment.

7. The Eel River watershed is listed on the Clean Water Act section 303(d) list as impaired for sediment and temperature. In December, 2004, the U.S. EPA established sediment and temperature total maximum daily loads (TMDLs) for the Upper Main Eel River and tributaries. Additionally, in December, 1999, the U.S. EPA established sediment and temperature TMDLs for the South Fork Eel River and tributaries. Roads are a significant source of sediment in the watershed (directly, from surface erosion, and, indirectly, by triggering landslides. In addition, activities that impact stream bed, banks, and floodplains and reduce riparian vegetation are identified as sources contributing to increased stream temperatures. Such projects may involve removal of vegetation and/or channel alteration, and also have potential to increase sediment loads. A focus on measures to reduce sediment discharges to surface waters from roads in the watershed, and measures to avoid, minimize, and mitigate impacts on riparian zones is essential for achieving TMDL, Basin Plan, and CEQA compliance

8. Pursuant to Regional Water Board Resolution R1-2004-0087, *Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters within the North Coast Region* (Sediment TMDL Implementation Policy), the Executive Officer is directed to "rely on the use of all available authorities, including existing regulatory standards, and permitting and enforcement tools to more effectively and efficaciously pursue compliance with sediment-related standards by all dischargers of sediment waste."

9. Pursuant to Regional Water Board Resolution R1-2012-0013, *Implementation of the Water Quality Objective for Temperature in the North Coast Region* (Temperature Implementation Policy), Regional Water Board staff are directed to address factors that contribute to elevated water temperatures when issuing 401 certifications or WDRs (permits) for individual projects. Any permit should be consistent with the assumptions and requirements of temperature shade load allocations in areas subject to existing temperature TMDLs, including EPA- established temperature TMDLs, as appropriate. If applicable, any permit or order should implement similar shade controls in areas listed as impaired for temperature but lacking a TMDL and region-wide as appropriate and necessary to prevent future impairments and to comply with the intrastate temperature objective.

10. The federal antidegradation policy requires that state water quality standards include an antidegradation policy consistent with the federal policy. The 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 Order 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.

11. This discharge is also regulated under 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," which requires compliance with all conditions of this certification.

Receiving Waters:	Wetlands and intermittent, ephemeral and perennial streams Eel River Hydrologic Unit No.111.00 Outlet Creek Hydrologic Sub-Area No.111.61 Laytonville Hydrologic Sub-Area No.111.33 Benbow Hydrologic Sub-Area No.111.32
Filled and/or Excavated Areas:	Permanent – streams (Waters of U.S.): 0.0133 acre Permanent – riparian (Waters of State): 0.0023 acre Temporary – streams (Waters of U.S.): 0.518 acre Temporary – wetlands (Waters of U.S.): 0.042 acre
Total Linear Impacts:	Permanent – streams (Waters of U.S.): 89 linear feet Permanent – riparian (Waters of State): 73 linear feet Temporary – streams (Waters of U.S.): 274 linear feet Temporary – riparian (Waters of State): 73 linear feet
Dredge Volume :	None
Fill Volume :	157 cubic yards
Latitude/Longitude:	39.6472 N / 123.4759 W

Accordingly, based on its independent review of the record, the Regional Water Board certifies that the Caltrans – Highway 101 Mendocino County Culvert Rehabilitation Project (WDID No. 11B10092WNME), as described in the 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.

4. All conditions required by this Order shall be included in the Plans and Specifications prepared by Caltrans for the Contractor. In addition, Caltrans shall require compliance with all conditions included in this Order in the bid contract for this project.

5. Caltrans shall provide a copy of this order and State Water Resources Control Board (SWRCB) 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.

6. The Regional Water Board shall be notified in writing each year at least five working days (working days are Monday – Friday) prior to the commencement of ground disturbing activities, water diversion activities or construction activities with details

regarding the construction schedule, in order to allow Regional Water Board staff to be present on-site during installation and removal activities, and to answer any public inquiries that may arise regarding the project. Caltrans shall provide Regional Water Board staff access to the project site to document compliance with this order.

7. The Resident Engineer (or appropriately authorized agent) shall hold on-site water quality permit compliance meetings (similar to tailgate safety meetings) to discuss permit compliance, including instructions on how to avoid violations and procedures for reporting violations. The meetings shall be held at least every other week, before forecasted storm events, and when a new contractor or subcontractor arrives to begin work at the site. The contractors, subcontractors and their employees, as well as any inspectors or monitors assigned to the project, shall be present at the meetings. Caltrans shall maintain dated sign-in sheets for attendees at these meetings, and shall make them available to the Regional Water Board on request.

8. All activities and best management practices (BMPs) shall be implemented according to the submitted application and the conditions in this certification. BMPs for erosion, sediment, turbidity 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. In addition, BMPs for erosion and sediment control shall be utilized year round, regardless of season or time of year. 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.

9. 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.

10. 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, they may submit a request along with a BMP plan to the Executive Officer of the Regional Water Board for review, consideration, and concurrence.

11. 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 (NPDES) Permit and receive notification of coverage to discharge to surface waters, prior to the discharge.

12. 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.

13. Caltrans shall submit, subject to review and concurrence by the Regional Water Board staff, a dewatering and/or diversion plan that appropriately describe the dewatered or diverted areas and how those areas will be handled during construction. The diversion/dewatering plans 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. The in-channel work will only be conducted between June 15 and October 15. This Order does not authorize Caltrans to draft surface waters.

14. 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.

15. Caltrans shall implement appropriate BMPs to prevent the discharge of equipment fluids to the stream channel. The minimum requirements will include: storing hazardous materials at least 150 linear feet outside of the stream banks; checking equipment for leaks and preventing the use of equipment with leaks; pressure washing or steam cleaning equipment to remove fluid residue on any of its surfaces prior to its entering any stream channel in a manner that does not result in a discharge to waters of the State.

16. 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.

17. 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 request authorization from the Regional Water Board. Plans to reuse or recycle wastewater require written approval from Regional Water Board staff.

18. 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 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.

19. 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.

20. Only clean washed spawning gravel (0.25" – 6") with a cleanliness value of at least 85, using the Cleanness Value Test Method for California Test No. 227 will be placed in the streams. Gravel bag fabric shall be nonwoven polypropylene geotextile (or comparable polymer) and shall conform to the following requirements:

    - Mass per unit area, grams per square meter, min ASTM Designation: D 5261 – 270
    - Grab tensile strength (25-mm grip), kilonewtons, min. ASTM Designation: D4632* 0.89
    - Ultraviolet stability, percent tensile strength retained after 500 hours, ASTM Designation: D4355, xenon arc lamp method 70 or appropriate test method for specific polymer
    - Gravel bags shall be between 600 mm and 800 mm in length, and between 400 mm and 500 mm in width.
    - Yarn used in construction of the gravel bags shall be as recommended by the manufacturer or bag supplier and shall be of a contrasting color. Gravel shall be between 0.5" – 4" in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel-filled bags shall be secured to prevent gravel from escaping. Gravel-filled bags shall be between 13 kg and 22 kg in mass.
    - Caltrans shall request approval from the Regional Water Board if an exception from this requirement is needed for a specific location.

21. In order to demonstrate compliance with receiving water limitations and water quality objectives surface water monitoring shall be conducted. When conducting surface water monitoring Caltrans shall establish discharge, upstream (background) and downstream monitoring locations to demonstrate compliance with applicable water quality objectives. The downstream location shall be no more than 100 feet from the discharge location.

    A. Surface water monitoring shall be conducted whenever a project activity is conducted within waters of the State (including but not limited to stream diversions, pile installation, and cofferdam installation or removal). Measurements and observations shall be collected from each sampling location four times daily.

    B. Surface water monitoring shall be conducted immediately when any project activity has mobilized sediment or other pollutants resulting in a discharge and/or has the potential to alter background conditions within waters of the State (including but not limited to storm water runoff, concrete discharges,

leaks, and spills.). The continuing frequency is contingent upon results of field measurements and applicable water quality objectives.

Surface water monitoring field measurements shall be taken for pH, turbidity and temperature. In addition, visual observations of each location shall be documented daily for each established monitoring location and monitoring event and include the estimate of flow, appearance of the discharge including color, floating or suspended matter or debris, appearance of the receiving water at the point of discharge (occurrence of erosion and scouring, turbidity, solids deposition, unusual aquatic growth, etc), and observations about the receiving water, such as the presence of aquatic life. If a project activity has reached a steady state and is stable then Caltrans may request a temporary reprieve from this condition from the Regional Water Board until an activity or discharge triggers the monitoring again.

22. Whenever, as a result of project activities (in-stream work or a discharge to receiving waters), downstream measurements exceed any water quality objective 100 feet downstream of the source(s) all necessary steps shall be taken to install, repair, and/or modify BMPs to control the source(s). The frequency of surface water monitoring shall increase to hourly and shall continue until measurements demonstrate compliance with water quality objectives for each parameter listed below and measured levels are no longer increasing as a result of project activities. In addition, the overall distance from the source(s) to the downstream extent of the exceedence of water quality objectives shall be measured.

    Monitoring results shall be reported to appropriate Regional Water Board staff person by telephone within 24 hours of taking any measurements that exceed the limits detailed below (only report turbidity if it is higher than 20 NTU).

pH	<6.5 or >8.5 (any changes >0.5 units)
turbidity	20% above natural background

    Monitoring results and upstream and downstream pictures within the working and/or disturbed area and discharge location shall be taken and submitted to the appropriate Regional Water Board staff within 24 hours of the incident. All other monitoring data documenting compliance with water quality objectives shall be reported on a monthly basis and is due to the Regional Water Board by the 15th of the following month.

23. Post Storm Event Reports:

    - Once the project has begun ground-disturbing activities, and subsequent to a qualifying rain event that exceeds 0.5-inches of precipitation, Caltrans shall inspect the project within 24 hours and take photos of all discharge locations, and disturbed areas, including all excess materials disposal areas, in order to

demonstrate that erosion control and revegetation measures are present and have been installed appropriately and are functioning effectively. A brief report containing these photos, corrective actions (if necessary), and any surface water monitoring results collected pursuant to this Order or the Construction General Permit (SWRCB Order 2009-009 DWQ) shall be submitted to the Regional Water Board within 10 days after the end of the qualifying rain event. Inspections are required daily during extended rain events. Once the project site is stable, in a steady state (channel- ground- or vegetation-disturbing activities have ceased), and has demonstrated sufficient and effective erosion and sediment control, Caltrans may request a reprieve from this condition from the Regional Water Board. At least one post-construction inspection is required to demonstrate sufficient and effective erosion and sediment control and compliance with the Basin Plan.

- Rain events are periods of precipitation that that are separated by more than 48-hours of dry weather. Rainfall amounts may be taken from on-site rain gauges, from the nearest California Data Exchange Center station (http://cdec.water.ca.gov), or by a custom method or station approved by Regional Water Board staff.

24. Caltrans shall perform on-site and off-site mitigation actions in accordance with the Mitigation and Monitoring Plan Summary, dated April 2010. Compensatory mitigation for permanent impacts consists of enhancing 0.063 acre of riparian woodland along Long Valley Creek and 0.044 acre of upland buffer. On-site impacts to 0.042 acres wetlands shall be restored immediately after construction. As-built plans shall be developed for all the mitigation sites (temporary and permanent) within 30-days following their construction. In addition, Caltrans shall construct weirs and improve fish passage and enhance fish habitat condition and connectivity within Ten Mile Creek adjacent to the crossing at Highway 101(PM 66.50). The off-site mitigation actions and fish passage project shall be completed by November 2014; annual mitigation reports are due annually on December 31, with the first report due December 31, 2014.

25. 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.

26. 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.

27. This Order is not transferable. In the event of any change in control of ownership of land presently owned or controlled by the Applicant, the Applicant shall notify the successor-in-interest of the existence of this Order by letter and shall forward a copy of the letter to the Regional Water Board. The successor-in-interest must send to the Regional Water Board Executive Officer a written request for transfer of this Order to discharge dredged or fill material under this Order. The request must contain the following:

    a. requesting entity's full legal name
    b. the state of incorporation, if a corporation
    c. address and phone number of contact person
    d. description of any changes to the project or confirmation that the successor-in-interest intends to implement the project as described in this Order.

28. Except as may be modified by any preceding conditions, all certification actions are contingent on: a) the discharge being limited, and all proposed revegetation, avoidance, minimization, and mitigation measures being completed, in strict compliance with Caltrans' project description and CEQA documentation, as approved herein, b) Caltrans shall construct the project 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.

29. The authorization of this certification for any dredge and fill activities expires on April 2, 2017. 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.

30. Please contact our staff Environmental Specialist / Caltrans Liaison Jeremiah Puget of at (707) 576-2835 or jpuget@waterboards.ca.gov if you have any questions.

Catherine Kuhlman
Executive Officer

120402_JJP_CDOT_Hwy101_MendoCountyCulverts_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:	Ms. Sandra Rosas, Caltrans, District 3, 703 B Street, P.O. Box 911 Marysville, CA 95901
Copies to:	Mr. Sean Marquis, Caltrans, District 3, 703 B Street, P.O. Box 911 Marysville, CA 95901
Electronic Copies to:	U.S. Army Corps of Engineers, Regulatory Functions - San Francisco District

State of California
Department of Fish and Wildlife

Memorandum

Date: February 12, 2016

To: Mr. Frank Demling
Project Manager
California Department of Transportation
1656 Union Street
Eureka, California 95501
Frank.demling@dot.ca.gov

From: Mr. Gordon Leppig
Senior Environmental Scientist, Supervisor
California Department of Fish and Wildlife
619 Second Street
Eureka, California 95501

Subject: Extension of Lake or Streambed Alteration
Notification No. 1600-2010-0296-R1
Mendocino County

The California Department of Fish and Wildlife (Department) received your request to extend the Lake or Streambed Alteration Agreement (Agreement) and the extension fee, for the above referenced agreement. The Department hereby grants your request to extend the Agreement expiration date from December 31, 2015 to December 31, 2020. All other conditions in the original Agreement remain in effect.

Copies of the original Agreement, amendments, and this letter must be readily available at project worksites and must be presented when requested by a Department representative or other agency with inspection authority.

If you have any questions regarding this matter, please contact JoAnn Loehr, Staff Environmental Scientist at 707-441-2076 or joann.dunn@wildlife.ca.gov.

ec: Adele.pommerenck@dot.ca.gov
Allison.kunz@dot.ca.gov
Liza.walker@dot.ca.gov

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
NORTHERN REGION
601 LOCUST STREET
REDDING, CA 96001

LAKE OR STREAMBED ALTERATION AGREEMENT
NOTIFICATION NO. 1600-2010-0296-R1
Named and Unnamed Tributaries in the South Fork Eel River Watershed

CALIFORNIA DEPARTMENT OF TRANSPORTATION
HIGHWAY 101 MENDOCINO COUNTY 29 CULVERT REHABILITATION PROJECT

This Lake or Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and Mr. Mr. Frank Demling (Permittee) representing the California Department of Transportation (Caltrans).

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified CDFW on August 18, 2010, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1602, 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 Highway 101 Mendocino County Culvert Rehabilitation Project (Project) includes work at 29 locations on Route 101 between and including Post Miles 50.18 and 84.52 and between the communities of Willits and Leggett in Mendocino County, California. Culverts to be repaired are located on the Willits, Longvale, Laytonville, Cahto Peak, Tan Oak Park, and Leggett US Geological Survey (USGS) 7.5 minute quadrangles.

PROJECT DESCRIPTION

The Project will repair, upgrade, or replace existing drainage facilities at 29 locations on Route 101 between and including Post Miles 50.18 and 84.52 in Mendocino County. Depending on location, proposed work may include construction of headwalls and inlet

or outlet flared end sections, placing rock slope protection and rock energy dissipaters, lining existing culverts with high density polyethylene or cementitious pipe liner, replacing or extending existing culverts, replacing existing downdrains and cable anchorage systems, installing cable railings, and replacing or modifying culvert drainage inlets. At Post Mile 66.50, a rock weir will be constructed downstream of the existing culvert on Tenmile Creek to improve fish passage.

All work shall be in accordance with submitted plans and diagrams and any subsequent revisions approved by the CDFW in writing. Work is limited to the following locations:

Location Number	PM	Culvert Type	Watercourse	Receiving Water
1	50.18	36-inch CSP	Unnamed tributary	Outlet Creek
2	50.41	24-inch CSP	Unnamed tributary	Outlet Creek
3	51.42	36-inch CSP	Unnamed tributary	Outlet Creek
4	52.44	18-inch CSP	Unnamed tributary	Ryan Creek
5	54.20	18-inch CSP	Unnamed tributary	Reeves Creek
6	57.54	18-inch CSP	Unnamed tributary	Outlet Creek
7	57.58	18-inch CSP	Unnamed tributary	Outlet Creek
8	57.63	18-inch CSP	Unnamed tributary	Outlet Creek
9	58.59	30-inch CSP	Unnamed tributary	Outlet Creek
10	58.82	86-inch Concrete Arch	Unnamed tributary	Outlet Creek
11	62.69	Overside Drain	Unnamed tributary	Long Valley Creek
12	66.50	84-inch Double RCB	Tenmile Creek	South Fork Eel River
13	74.70	18-inch CSP	Unnamed tributary	Tenmile Creek
14	75.55	18-inch CSP	Unnamed tributary	Tenmile Creek
15	76.62	18-inch CSP	Unnamed tributary	Tenmile Creek
16	76.78	18-inch CSP	Unnamed tributary	Tenmile Creek
17	78.18	18-inch CSP	Unnamed tributary	Rattlesnake Creek
18	79.79	18-inch CSP	Unnamed tributary	Rattlesnake Creek
19	79.88	18-inch CSP	Unnamed tributary	Rattlesnake Creek
20	81.30	24-inch CSP	Unnamed tributary	Rattlesnake Creek
21	81.56	24-inch CSP	Unnamed tributary	Rattlesnake Creek
22	81.80	26-inch CSP	Unnamed tributary	Rattlesnake Creek
23	81.88	24-inch CSP	Unnamed tributary	Rattlesnake Creek
24	82.63	24-inch CSP	Unnamed tributary	Rattlesnake Creek
25	82.77	24-inch CSP	Unnamed tributary	Rattlesnake Creek
26	82.81	24-inch CSP	Unnamed tributary	Rattlesnake Creek
27	83.18	30-inch CSP	Unnamed tributary	Rattlesnake Creek
28	83.25	78-inch CSP	Mad Creek	Rattlesnake Creek
29	84.52	42-inch CSP	Unnamed tributary	Rattlesnake Creek

CSP = Corrugated Steel Pipe
RCB = Reinforced Concrete Box

PROJECT IMPACTS

Existing fish, wildlife and sensitive habitat resources the Project could substantially adversely affect include: riparian habitat, Baker's Navarretia (*Navarretia leucocephala* subsp. *bakeri*), a special status plant species; yellow warbler (*Dendroica petechia brewsteri*), yellow-breasted chat (*Icteria virens*), and other riparian-dependent bird species; Northern California steelhead (*Oncorhynchus mykiss*), Chinook salmon (*O. tshawytscha*), Central California Coast coho salmon (*O. kisutch*), as well as non-game fishes; western pond turtle (*Emys marmorata*), foothill yellow-legged frog (*Rana boylii*), and other reptiles and amphibians, as well as other aquatic and riparian species.

The adverse effects the Project could have on the fish or wildlife resources identified above include: permanent removal of riparian habitat, disruption of nesting behavior and decreased reproductive success due to construction disturbance; loss of occupied passerine habitat and nests, including eggs and/or nestlings, as a result of vegetation removal; direct mortality of fish, amphibians, and other aquatic species during construction de-watering activities; temporary and permanent impacts to aquatic species due to suspended sediment and the smothering and/or shading of egg masses and benthic invertebrate communities due to sediment deposition.

As reported to date by Caltrans staff, the Project will result in permanent impacts to 0.44 acres of riparian habitat and zero permanent impacts to wetland habitat.

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 enter the Project site at any time, after notifying the Resident Engineer, to verify compliance with the Agreement.

1.5 Permittee's notification (Notification of Lake or Streambed Alteration together with all maps, plans, photographs, drawings, and all other supporting documents submitted with notification to describe the activity) is hereby incorporated by reference into this Agreement. Permittee shall conduct Project activities within the work areas and using the mitigative features described in the notification and supporting documents, unless such Project activities, work areas or mitigative features are modified by the provisions of this Agreement, in which case the activities shall be conducted as described in this 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.

2.1 Except where otherwise stipulated in this Agreement, all work shall be conducted in accordance with the forms, work plans, biological surveys, mitigation plans, maps and drawings submitted with Notification No. 1600-2010-0296, including pertinent additional information submitted to CDFW as late as June 26, 2013.

2.2 This Agreement pertains to 29 encroachments affecting Unnamed tributaries in the watersheds of the South Fork Eel River and Outlet, Ryan, Reeves, Long Valley Tenmile and Rattlesnake Creeks.

PROJECT TIMING

2.3 All work within the bed, bank and channel shall be confined to the period June 15 through October 15 of each year. Work may be conducted in or near the stream during the late season work period October 15 through November 1, provided adherence to all conditions in this Agreement and a) – c) below:

a) The Permittee shall complete any unfinished encroachment work, including erosion control measures, within 24 hours of CDFW directing the Permittee to do so.

b) Prior to any work at a site, the Permittee shall stock-pile erosion control materials at the site. All bare mineral soil exposed in conjunction with crossing construction, deconstruction, maintenance or repair or removal shall be treated for erosion immediately upon completion of work on the crossing, and prior to the onset of precipitation capable of generating runoff.

c) When a 7-day National Weather Service forecast of rain includes a minimum of 5 consecutive days with any chance of precipitation, 3 consecutive days with a 30% or greater chance of precipitation, or 2 consecutive days of 50% or greater chance of precipitation, the Permittee shall finish work underway at encroachment and refrain from starting any new work at encroachment prior to the rain event.

HABITAT AND SPECIES PROTECTION

2.4 Work authorized under this Agreement shall not commence until CDFW has reviewed and approved, in writing, the Permittee's final Mitigation Monitoring Plan.

2.5 Removal of the above-ground portions of existing trees and shrubs shall occur after August 31 and before February 1 to avoid impacts to nesting birds. If vegetation must be removed during the nesting season (February 1 to August 31) nest surveys shall be conducted prior to vegetation clearing (see Measure 2.6).

2.6 If vegetation is proposed for removal during the nesting season (February 1 to August 31), an avian and nest survey protocol (Bird Survey Protocol) and a nest protection and monitoring plan shall be submitted to CDFW for review and approval. CDFW will be allowed up to 30 days to review and approve the Bird Survey Protocol. The Bird Survey Protocol and nest protection and monitoring plan shall include the following: a) list of bird species expected to nest in the area, b) description of life histories, c) survey protocols that are designed and tailored specifically to detect the various species expected to nest in the area, d) proposed nest buffer and nest protection measures, e) project activity disturbance monitoring, and e) reporting protocols.

2.7 The Permittee shall instruct all persons who will be completing any ground disturbing activity at a work site to comply with the conditions set forth in this Agreement and shall inspect each work site before, during, and after completion of any ground-disturbing activity at the work site.

2.8 This Agreement does not authorize the take of any State threatened or endangered species. If the Project could result in the "take" of a state listed threatened or endangered species, the Permittee has the responsibility to obtain from CDFW, a California Endangered Species Act Permit (CESA 2081 Permit). CDFW may formulate a management plan that will avoid or mitigate take.

2.9 Prior to initiating channel- vegetation- or ground-disturbing Project activities, Permittee shall clearly delineate the limits of the work area. Permittee shall restrict all Project activities to the designated work area and shall maintain all fencing, stakes and flags until the completion of Project activities.

2.10 Disturbance or removal of riparian and streamside vegetation shall not exceed the minimum necessary to complete operations. Where feasible, hand tools (chain

saws, etc.) shall be used to trim woody riparian vegetation to the extent necessary to gain access to work sites. Whenever possible, root systems shall be left intact to facilitate more rapid recovery following temporary construction impacts.

2.11 Except where provided for within this Agreement, the removal of riparian vegetation from the streambed or streambanks is prohibited without prior written approval from CDFW.

2.12 For riparian habitat that will be permanently removed or have long-term significant damage as a result of this project, new riparian habitat will be created consisting of the same type and/or species as removed and will be replaced at a minimum 2:1 replacement to take ratio based on affected area. Created riparian habitat shall be monitored post-project for a minimum of five years to ensure rooting and long term success. Dead and/or dying replacement plants shall be replaced.

2.13 Unless otherwise agreed to by CDFW, the Permittee shall ensure that all mitigation areas addressed in Measure 2.12 of this Agreement are protected in perpetuity and allowed to function as riparian habitat.

2.14 Special status plant populations, wetlands, and riparian habitats adjacent to work areas shall be designated as Environmentally Sensitive Areas (ESAs) and shall be protected from disturbance by construction activities.

2.15 ESA fencing shall consist of temporary orange construction fence or other highly visible material that clearly delineates the limits of the work area. Environmentally Sensitive Areas shall be clearly shown on the Project plans and drawings. The Permittee shall ensure that the contractor, subcontractors, and all personnel working on the Project are instructed on the purpose of the ESA fencing and understand the limits of the work area.

2.16 ESA fencing shall be installed as a first order of work and shall remain in place until all construction activities area complete. The placement of ESA fencing shall be inspected and approved by CDFW prior to the initiation of work. Permittee shall provide written notification for inspection a minimum of 5 working days prior to beginning work. If CDFW is unable to conduct a site inspection during this period, the inspection may be conducted by the Environmental Construction Liaison and the results forwarded to CDFW for approval.

TEMPORARY DIVERSIONS AND CONSTRUCTION DEWATERING

2.17 All work within the channel or on the banks shall be performed when the stream is dry or at low flow. If water is present during construction, all work shall be performed in isolation from surface or subsurface flow.

2.18 Where water is present, a temporary stream diversion shall be constructed to isolate the work area from flow. Temporary diversions may be constructed using gravel berms, clean washed spawning gravels, sand bags, K-rail, plastic sheeting, or a combination of these materials upstream from the work area. Flows will then be diverted into a temporary culvert, pipe, or conduit and released downstream from the work area.

2.19 The clear water diversion shall be adequately sized to accommodate the full range of flows that may occur during the diversion period without overtopping into the work area.

2.20 Dewatering shall be done in a manner that prevents the discharge of material that could be deleterious to fish, plants or other aquatic life and maintains adequate flows to downstream reaches during all times natural flow would have supported aquatic life.

2.21 Any turbid water pumped from the work area shall be used for construction purposes (compaction, dust abatement, etc.) or properly disposed of in an upland area where it will not drain to surface waters or wetlands.

2.22 Water that has been in contact with uncured concrete shall be disposed of in a concrete wash-out facility or other impervious container and shall not be discharged to ground or surface waters.

2.23 Temporary culverts, conduits, diversion structures, and all other materials not designed to withstand high flows shall be removed from the floodplain prior to October 15.

2.24 Water drafting is not authorized by this Agreement.

ROCK SLOPE PROTECTION AND ENERGY DISSIPATERS

2.25 Unless otherwise required by this Agreement, rock slope protection (RSP) or rock energy dissipaters shall be provided at culvert outlets as necessary to prevent erosion.

2.26 Rock slope protection and energy dissipater materials shall consist of clean rock appropriate for its intended application and sized and properly installed to resist washout. RSP slopes shall be supported with properly sized boulders "keyed" into

a footing trench with a depth sufficient to properly seat the footing course boulders and prevent instability.

2.27 With the exception of work at Post Mile 66.50, any RSP on the banks of Outlet, Reeves, Tenmile, and Rattlesnake Creeks shall be placed above the ordinary high water mark where it will not encroach on the stream channel.

EROSION AND SEDIMENT CONTROL

2.28 The Project shall at all time feature adequate erosion and sediment control devices to prevent the degradation of water quality.

2.29 All bare mineral soil exposed in conjunction with project related activities shall be treated for erosion prior to the onset of precipitation capable of generating run-off or the end of the yearly work period, whichever comes first. Treatments shall include using native slash or seeding and mulching of all bare mineral soil exposed in conjunction with encroachment work. Only clean straw (such as rice, barley, wheat, or weed-free straw), and seeding with regional native seed or non-native seed that is known not to persist or spread (e.g., barley (*Hordeum vulgare*) or wheat (*Triticum aestivum*) shall be used. No known invasive grass seed shall be used such as annual or perennial ryegrass (*Lolium multiflorum or L. perenne*, which are now referred to as *Festuca perennis*).

2.30 Only wildlife-friendly 100 percent biodegradable erosion control products that will not entrap or harm wildlife shall be used. Erosion control products shall not contain synthetic (e.g., plastic or nylon) netting. Photodegradable synthetic products are not considered biodegradable.

2.31 All equipment used during construction of this Project shall be cleaned (i.e. free of dirt and debris that may harbor noxious weed seeds and plant parts) prior to its arrival on site and before leaving the Project area.

PETROLEUM, CHEMICAL AND OTHER POLLUTANTS

2.32 All construction-related materials and equipment shall be stored in designated staging areas located outside of the floodplain unless approved in writing by CDFW.

2.33 Refueling and vehicle maintenance shall be performed at least 100 feet from streams or other water bodies unless approved in writing by CDFW.

2.34 No equipment or machinery shall be operated within any flowing stream.

2.35 Any equipment or vehicles driven and/or operated within or adjacent to the stream channel shall be checked and maintained daily to prevent leaks of materials that, if introduced to water, could be deleterious to aquatic life, wildlife, or riparian habitat.

2.36 Stationary equipment such as motors, pumps, generators, and welders that contain deleterious materials, located adjacent to the stream channel shall be positioned over drip pans.

2.37 All activities performed in or near a stream shall have absorbent materials designated for spill containment and clean up activities on-site for use in an accidental spill. The Permittee shall immediately notify the California Emergency Management Agency at 1-800-852-7550 and immediately initiate the clean up activities. CDFW shall be notified by the Permittee and consulted regarding clean-up procedures.

2.38 No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, asphalt, paint or other coating material, oil or petroleum products or other organic or earthen material from any construction, or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream or lake.

2.39 To prevent the release of materials that may be toxic to fish and other aquatic species, poured concrete shall be isolated from stream flow and allowed to dry/cure for a minimum of 30 days. As an alternative, the Responsible Party shall monitor the pH of water that has come into contact with the poured concrete. If this water has a pH of 9.0 or greater, the water shall be pumped to tanker truck or to a lined off-channel basin and allowed to evaporate or be transported to an appropriate facility for disposal. During the pH monitoring period, all water that has come in contact with poured concrete shall be isolated and not allowed to flow downstream or otherwise come in contact with fish and other aquatic resources. The water shall be retested until pH values become less than 9.0. Once this has been determined, the area no longer needs to be isolated and water may be allowed to flow downstream. Results of pH monitoring shall be made available to CDFW upon request,

SITE SPECIFIC MEASURES:

2.40 For Project Location Number 1 at Post Mile 50.18, work when site is dry to minimize impacts to adjacent wetland habitat.

2.41 For Project Location Number 5 at Post Mile 54.20, avoid or minimize the use of rock slope protection at the new culvert outlet.

2.42 For Project Location Number 12 at Post Mile 66.50, the Permittee shall adhere to the following:

a) In-water operations proposed within or adjacent to the existing double reinforced concrete box at this location are not authorized under this Agreement until the

Permittee has obtained an incidental take permit for coho salmon from CDFW pursuant to Fish and Game Code section 2081.

b) All weir-related construction work within the channel or on the banks of Tenmile Creek at Post Mile 66.5 shall be conducted when the stream is dry to avoid direct impacts to salmonids.

c) If subsurface flow is encountered during work at Post Mile 66.5, any turbid water shall be pumped from the work area to an upland disposal site where it cannot re-enter the stream.

d) Unless otherwise authorized by CDFW, the Permittee shall adhere to the rock weir design that was most recently submitted to CDFW's Marcin Whitman for his review and approval (See Exhibit A; March 27, 2013 memorandum from Marcin Whitman to Rick Macedo regarding Project Location Number 12 at Post Mile 66.5 on State Route 101).

e) Unless otherwise approved of by CDFW, the Permittee is responsible in for maintaining the weir in properly functioning condition including promptly maintaining the grade control features if they no longer provide good fish passage.

f) Guidance in Section XII of the *California Salmonid Stream Habitat Restoration Manual* shall be followed during weir construction to prevent seepage of low flow and to provide maximum stability.

g) Construction of the rock weir shall be conducted by a qualified contractor with experienced in rock weir design present for this stage of the construction.

h) Weir construction shall not begin until CDFW has reviewed and approved a monitoring plan for the rock weir.

i) Rock weir construction shall not begin until the Permittee has facilitated a pre-construction meeting that is attended by CDFW's hydraulic engineer or his/her designee.

j) CDFW's QA/QC spreadsheet (or equivalent provided by the Permittee) shall be developed for the rock weir and available for review and approval before the pre-construction meeting.

k) The Permittee shall contact CDFW's Senior Hydraulic Engineer Marcin Whitman at marcin.whitman@wildlife.ca.gov at least one month before construction at the rock weir site begins.

2.43 For Project Location Number 16 at Post Mile 76.62, pre-construction surveys shall be conducted by a qualified biologist at the appropriate time of the year to identify and map the limits of the Baker's Navarretia population. Work when site is dry to minimize impacts to adjacent wetland habitat.

2.44 For Project Location Number 26 at Post Mile 83.25, work at this location shall not begin until CDFW has assessed this site for potential fish migration concerns and responded, in writing, to the Permittee with its findings.

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:

Mr. Frank Demling
California Department of Transportation
1656 Union Street
Eureka, California 95501
Fax: (916) 274-0602
e-mail: frank_demling@dot.ca.gov
Telephone: (707) 445-6554

ec: Mr. Alfred Kannely
California Department of Transportation
alfred_kannely@dot.ca.gov

To CDFW:

Department of Fish and Wildlife
Region 1
619 Second Street, Eureka, California 95501
Attn: Lake and Streambed Alteration Program – Laurie Harnsberger
Notification #1600-2010-0296-R1
Fax: 707-441-2021
E-mail: laurie.harnsberger@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.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on December 31, 2015, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

EXHIBITS

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

A. Exhibit A. March 27, 2013 memorandum from Marcin Whitman to Rick Macedo regarding Project Location Number 12 at Post Mile 66.5 on State Route.

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 DEPARTMENT OF TRANSPORTATION

Frank Demling — Date: 6-27-2013

FOR DEPARTMENT OF FISH AND WILDLIFE

For Curt Babcock — T. Cabanela — Date: 6/27/13
Habitat Conservation Program Manager

Prepared by: Original draft Agreement prepared by Craig Martz
Revised Agreement prepared by Rick Macedo on 6-26-13
with additional revisions on 6-27-13

Exhibit A. March 27, 2013 memorandum from Marcin Whitman to Rick Macedo regarding Project Location Number 12 at Post Mile 66.5 on State Route 101.

Flex your POWER

State of California

Memorandum

Date: March 27, 2013

To: Rick Macedo
Coastal Conservation Planning
CDFW

From: Marcin Whitman
Senior Hydraulic Engineer
CDFW

Subject: Ten Mile River Crossing, Highway 101 MP 66.5 MEN

Rick,

As you know, I have been in conversation with several Caltrans staff and our Caltrans liaison Joanne Dunn (CDFW) regarding the scour repair and fish passage improvement at Highway 101 MP 66.5 Mendocino County and Ten Mile Creek.

As you recall, the site has some unique features. The current crossing is a replacement of an earlier crossing abandoned just downstream. Some of the wingwalls and other sections of this abandoned crossing have fallen into the stream course acting both as a grade control and creating scour pools. In 2007, Scott Harris and other biologists advised me, as part of rehabilitating fish passage at this site, that these pieces of concrete were providing desirable habitat and should not be removed as part of this project. The project also had ample hydraulic capacity and, in fact, one of the bores is experiencing significant deposition.

Caltrans, acting on the advice of CDFW therefore designed a weir downstream of the current crossing and has demonstrated, in their various submitted materials and meetings, an acceptable design to improve fish passage at this site while leaving the abandoned structure "as is."

It is important that all involved parties recognize that this approach is an expedient measure and Caltran, as owner of the crossing, is responsible in perpetuity to provide good fish crossing conditions at this site. This responsibility includes but is not limited to promptly maintaining the grade control features if they no longer provide good fish passage.

Exhibit A (Continued)

The designed measures, executed correctly, should provide improvement in fish passage at this site. It is important that when constructing the rock weir that construction guidance in Section XII of the manual is referenced both to prevent seepage of low flow and to provide maximum stability given the material used. It would be best to have someone experienced in rock weir design present for this stage of the construction.

Between the design documents from several years ago and recent supplements this spring, Caltrans has provided all the materials for an acceptable design with the exception of a monitoring plan. It is my understanding that the monitoring plan is forthcoming and should be provided before construction begins.

As we know, construction can reveal unforeseen site conditions or circumstances. In reaction to such new information, it may be appropriate to modify the design. CDFW has been using a QA/QC spreadsheet both to assure that the project is constructed as intended and to keep the designer, contractor and CDFW in close contact during construction in case field modifications are in order. This QA/QC spreadsheet (or equivalent provided by Caltrans) should be tailored to this site by Caltrans before the pre-construction meeting. Also, please contact me at least one month before construction starts so I have this on my "Alert" list. If I am not available and construction problems arise, contact another of the CDFG engineering team.

Looking forward to this project going to construction and improving capacity of this crossing.

Marcin Whitman
CDFG Hydraulic Engineer

cc: CDFG
Gary Flosi
Trevor Tollefson
Joann Dunn
Scott Harris

NMFS
Joel Casagrande
Rick Wantuck

CalTrans
Glenn Hurlburt
Frank Demling
Al Kannely

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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

March 27, 2013

In response, refer to:
2012-9354

Carolyn Brown, Chief
Environmental Stewardship Branch
California Department of Transportation, District 3
703 B Street
Marysville, California 95901

Dear Ms. Brown:

Thank you for your letter of October 30, 2012, requesting reinitiation 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.*). Your letter requests reinitiation of consultation for the repair of 11 culverts beneath State Route (SR) 101 in Mendocino County, California. 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. This letter transmits NMFS' biological opinion for Caltrans' proposed repair of 11 culverts beneath SR101 in Mendocino County.

The enclosed biological opinion is based on our review of Caltrans' proposed project and describes NMFS' analysis of the potential effects on the threatened Southern Oregon Northern California Coast (SONCC) coho salmon Evolutionary Significant Unit (ESU), the threatened North Coast (NC) steelhead Distinct Population Segment (DPS), and the California Coastal (CC) Chinook salmon ESU in accordance with the ESA. In the enclosed biological opinion, NMFS concludes the repair of 11 culverts beneath SR101 in Mendocino County is not likely to jeopardize the continued existence of the SONCC coho salmon and CC Chinook salmon ESUs, or the NC steelhead DPS. NMFS has also concluded the project is not likely to result in the destruction or adverse modification of critical habitat for the SONCC coho salmon and CC Chinook salmon ESUs, or the NC steelhead DPS. However, NMFS anticipates take of listed SONCC coho salmon, CC Chinook salmon, and NC 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.

This letter also transmits NMFS' Essential Fish Habitat (EFH) Conservation Recommendations pursuant to section 305(b) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA). The project is located in an area that is identified as EFH for Pacific salmon, which are managed under the Pacific Coast Salmon Fishery Management Plan. Based on our

review, NMFS concludes the repair of 11 culverts beneath SR101 in Mendocino County will adversely affect EFH for Pacific coast salmon. However, the proposed action contains adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. Therefore, NMFS has no additional EFH Conservation Recommendations to provide.

Please contact Mr. Joel Casagrande at (707) 575-6016, or joel.casagrande@noaa.gov if you have any questions concerning this section 7 consultation, or if you require additional information.

Sincerely,

For Rodney R. McInnis
Regional Administrator

Enclosure

cc: Chris Yates, NMFS, Long Beach
Al Kannely, Caltrans, Marysville
Richard Macedo, CDFW, Cobb
Administrative File: 151422-SWR-2009-SR00380

BIOLOGICAL OPINION

ACTION AGENCY: California Department of Transportation (Caltrans)

ACTION: Reinitiation for the Repair of 11 Culverts Beneath State Route 101 in Mendocino County, California.

CONSULTATION CONDUCTED BY: National Marine Fisheries Service, Southwest Region

TRACKING NUMBER: SWR 2012-9354

DATE ISSUED: **March 27, 2013**

I. CONSULTATION HISTORY

The California Department of Transportation (Caltrans) will be acting as the Federal action agency for this consultation 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.

On August 7, 2009, NOAA's National Marine Fisheries Service (NMFS) issued a letter of concurrence (LOC) to Caltrans for repair activities at 11 culverts beneath State Route (SR) 101 in Mendocino County, California. Ten of the culvert locations are located on un-named, non-fish bearing, ephemeral tributaries to Outlet and Rattlesnake creeks. The remaining project is a scour repair and fish passage enhancement project on Tenmile Creek, tributary to the South Fork Eel River, located at Post Mile (PM) 66.50. An original minimization measure for the Tenmile Creek culvert restricted in-channel work to periods when the channel was dry. Caltrans conducted a field assessment of the site during late August 2012. A small number of juvenile salmonids were observed in the isolated pool at the culvert inlet (remains of a deceased juvenile salmonid were photographed). Based on this field review and construction schedule limitations, Caltrans determined the proposed activities are unlikely to be completed late enough in the season for fish bearing pools in the work area to dewater naturally. Caltrans contacted NMFS on September 13, 2012, for technical assistance and to discuss potential section 7 consultation options. Based on the available information, NMFS advised Caltrans to request reinitiation of formal consultation for the Tenmile Creek culvert location to ensure impacts to listed species and critical habitat are properly assessed.

On October 30, 2012, Caltrans requested reinitiation of 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 Tenmile Creek culvert scour repair and fish passage enhancement project at SR 101 on the threatened Northern California (NC) steelhead Distinct Population Segment (DPS), the threatened Southern Oregon/Northern California Coast (SONCC) coho salmon Evolutionary Significant Unit (ESU), and the threatened California Coastal (CC) Chinook salmon ESU, as well as designated critical habitat for each of the three DPS/ESUs. Because the Tenmile Creek project site was part of a larger and previous consultation with Caltrans, NMFS determined reinitiation of the entire original project (*i.e.*, repair of 11 eleven culverts) was necessary. After reviewing the available information, NMFS determined additional information, including specific design details and construction timeframes for the Tenmile Creek locations, was needed. This information was requested via email on November 13, 2012. On November 19, 2012, Caltrans responded with the necessary information at which time NMFS initiated consultation.

II. DESCRIPTION OF THE PROPOSED ACTION

Caltrans proposes to use funding from FHWA to repair 11 culverts associated with Highway 101 between Post Mile (PM) 46.24 and PM 84.52. At one of these sites, the Tenmile Creek culvert (PM 66.50 on SR 101 in Mendocino County, California), Caltrans will need to relocate listed salmonids prior to repairing scour damage and enhancing fish passage. A scour pool has formed over some time at the culvert inlet, which has exposed the foundation of the culvert's wingwall thereby threatening the integrity of the structure.

Caltrans expects the culvert work on the sites to occur between June 15 and October 15 and be completed between 2013 and 2015. For the Tenmile project site, the work will require approximately one month to complete, and will begin in either 2013 or 2014. At the Tenmile Creek site, Caltrans will delay dewatering and project construction until June 15 and after stream flow has naturally stopped and water in the channel is reduced to isolated pools or dries. The project work window will end on October 15 unless an extension is granted by NMFS and other resource agencies. There are no interrelated or interdependent actions associated with this project.

A. Description of Project Activities (Not Including Tenmile Creek)

Site 1. Hwy 101, PM 46.24 – unnamed tributary to Baechtel Creek: The culvert is a 60-inch corrugated steel pipe (CSP). Approximately 20 feet of the outlet end will be replaced and lined with a high-density polyethylene (HDPE) sleeve. The space between the culvert and liner will be grouted and a concrete transition section will be formed at the upstream end where the culvert meets the sleeve. More recently, Caltrans has been determined the culvert lies outside of Caltrans' right-of-way and, therefore, has been removed from the project.

Site 2. Hwy 101, PM 54.20 – unnamed tributary to Reeves Canyon Creek (Outlet Creek watershed): The 18-inch CSP culvert will be replaced with a 24-inch CSP with a new drainage

inlet and turnout. Minimal riparian vegetation disturbance will occur from accessing the work area.

Site 3. Hwy 101, PM 57.54 – unnamed tributary to Outlet Creek: A 15-inch polyvinyl chloride (PVC) liner will be inserted into the 18-inch CSP and grout will be placed between the interstitial space between the culvert and liner.

Site 4. Hwy 101, PM 57.58 – unnamed tributary to Outlet Creek: The 18-inch CSP will be fitted with a 15-inch PVC liner and grout will be applied between the culvert and liner. The work in this area will require access through the riparian vegetation for the placement of a six-foot by six-foot area of rock slope protection (RSP) within the riparian zone along Outlet Creek.

Site 5. Hwy 101, PM 57.63 – unnamed tributary to Outlet Creek: The 18-inch CSP will be fitted with a 15-inch PVC liner and grout will be applied between the culvert and the liner. A six-foot by six-foot light gradation rock energy dissipater will be installed at the outlet end. Riparian vegetation will be trimmed along Outlet Creek in order to gain access to the work area.

Site 6. Hwy 101, PM 58.59 – unnamed tributary to Outlet Creek: The 30-inch CSP culvert will be cleaned of sediment buildup and fitted with a 24-inch HDPE liner. The void between the culvert and liner will be grouted. A down drain section will be replaced with new CSP that will empty onto existing RSP. Access through the riparian area of Outlet Creek will be required to perform the work.

Site 7. Hwy 101, PM 58.82 – unnamed tributary to Outlet Creek: The culvert is a 14-foot by 7-foot concrete arch type, which needs repair to damaged concrete surface in the northern most box culvert and cleaning of a trash rack. The concrete area will be isolated from Outlet Creek during the repair. Concrete will be applied to the scoured area followed with an application of compounds to accelerate concrete curing and hardening, and to minimize the leaching of concrete in the creek.

Site 8. Hwy 101, PM 66.50 - Tenmile Creek: See Below.

Site 9. Hwy 101, PM 79.79 – unnamed tributary to Rattlesnake Creek: The existing 18-inch CSP culvert will be replaced with a new 24-inch CSP and a new straight concrete headwall will be placed at the inlet. Trimming of riparian vegetation along Rattlesnake Creek may be required.

Site 10. Hwy 101, PM 79.88 – unnamed tributary to Rattlesnake Creek: The existing 18-inch CSP culvert will be replaced with a new 30-inch CSP and a new straight concrete headwall will be placed at the inlet. The position of the inlet will also be placed at a skew point along the shoulder. Trimming of riparian vegetation along Rattlesnake Creek may be required.

Site 11. PM 81.30 – unnamed tributary to Rattlesnake Creek: The existing 24-inch CSP culvert will be replaced with the same size CSP culvert and a straight concrete headwall. Trimming of riparian vegetation along Rattlesnake Creek may be required.

Caltrans will incorporate best management practices (BMPs) into the project description to prevent pollution and minimize impacts to water quality with methods that include: refueling and maintaining equipment offsite; using sediment and erosion control devices; maintenance of drainage and culvert inlets; and other practices to maintain clean work areas.

B Description of Project Activities at the Tenmile Creek Culvert

1. Fish Relocation and Dewatering

Dewatering of the creek's isolated pools will be necessary if water is present prior to the start of construction. Before dewatering, a NMFS-approved fisheries biologist will isolate the work area and capture and relocate fish from the isolated area using authorized methods (*i.e.,* seining and/or backpack electrofishing). Captured fish will be relocated to the nearest suitable habitat. Caltrans will use a pump, screened with 0.2 inch mesh, to dewater the pool at the culvert inlet and, if necessary, the area where the rock weir will be constructed. The pump will be located above the Ordinary High Water Mark (OHWM) and water will be discharged to an upland location and not allowed to re-enter the creek channel. The biologist will be present during the dewatering to capture and relocate any fish that were missed during the initial relocation activities.

2. Scour Repair

A lateral scour pool has formed at the culvert inlet and along the river-left wingwall. After the channel is dewatered, an excavator located atop the wingwall and above OHWM, will be used to deepen the scour pool bottom along the base of the wingwall by approximately one and a half feet. The pool bottom will then be lined with a layer of erosion control fabric and then a layer of one-quarter ton rock will be applied. The fabric and rock will span the width of the left culvert barrel and wing wall (range of 10 to 16 feet wide) and will extend downstream approximately 12 feet along the length of the wingwall. The rock layer will then be covered with native substrate. The use of heavy equipment in the channel will not be necessary for this action. Hand labor will be necessary to apply the erosion fabric and position rocks.

3. Weir Construction

In 2008, Caltrans conducted an analysis of fish passage flow conditions for the Tenmile Creek culvert using the FishXing V3 software (Caltrans 2009). The results of this analysis indicated the existing culvert condition limits fish passage at certain flow levels due to a lack of suitable depth in the culvert. Additional trials with the FishXing software determined backwatering the culvert outlet by approximately 12 inches above the existing flowline would provide suitable passage (*i.e.,* depth) criteria for the desired flow ranges. To address this, Caltrans proposes to construct a single, channel-spanning rock weir located approximately 170 feet downstream of the culvert outlet and at an existing cobble bar. The weir will be designed to adequately pass all anadromous salmonid life stages. The designs and construction of the weir will follow the requirements and guidelines of Section XII of the California Department of Fish and Game's Salmonid Stream Habitat Restoration Manual (Flosi *et al.* 2004). The height differential between the top of the weir crest to the surface of the water below is twelve inches. However, the rocks within the weir crest will be positioned in order to create some areas with smaller (six

inch) jumps that will meet the maximum hydraulic jump standard stated in the NMFS' Guidelines for Salmonid Passage at Stream Crossings for juveniles. The weir will consist of a mixture of one-half-ton, one-ton, and two-ton rock. The weir will sit within an excavated trench across the creek channel and will be keyed into both banks by at least five feet. To construct the weir, Caltrans will require access to the creek channel by heavy equipment. Caltrans will construct an access path that will be between 11 and 18 feet wide leading from SR 101. This will require temporary disturbance of up to 0.08 acres of riparian and upland habitat including the removal of at least 4 trees (3 Douglas fir, 1 California bay) ranging in size from 4-5.5 inches diameter at breast height (DBH). An additional 3 trees (1 Oregon ash, 2 Douglas fir) ranging from 2 to 12.5 inches DHB may also be impacted. Understory vegetation will be trimmed to ground level in order to allow for natural re-sprouting.

4. Minimization Measures

Caltrans proposes to implement several measures to minimize impacts to steelhead and designated critical habitat. These include: (1) delaying channel dewatering and construction activities until surface waters have been reduced naturally to isolated pools; (2) adjusting the original design to preserve the scour pool at the culvert inlet; (3) minimizing access to a single route and conducting as much work from the top of bank as possible; (4) creating and adhering to a Storm Water Prevention Plan; (5) ensuring heavy equipment used in the channel is in good working condition and checked daily for leaks, and when not in use, heavy equipment will be stored in designated staging areas above the OHWM; and (6) vegetation removal will be limited to the greatest extent possible.

B. Action Area

The action area is located in several drainages in Mendocino County: Outlet, Rattlesnake and Tenmile creeks. Ten of the culvert locations are located on un-named, non-fish bearing, ephemeral tributaries to Outlet and Rattlesnake creeks. In Tenmile Creek, the action area for the proposed project includes two discrete locations in the channel: the scour hole along the left bank wingwall at the culvert inlet, and the proposed weir location approximately 170 feet downstream of the culvert outlet. The project will also include staging areas above the OHWM and an access path to the channel on the left bank that is estimated to be approximately 0.08 acres. Stream flow at the project location is typically reduced to isolated pools by the middle of summer. The action area includes the bed, banks and riparian area at each project site and a short distance downstream (likely less than 200 feet) to account for any increases in turbidity and sedimentation after the first winter rains.

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/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 ESA-listed salmonids 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 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 ESA-listed salmonids.

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/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 C.F.R. 402.02, which was invalidated by *Gifford Pinchot Task Force v. USFWS*, 378 F.3d 1059 (9th Cir. 2004), amended by 387 F.3d 968 (9th Cir. 2004). 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, sites for spawning, rearing, and migration), 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 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 designated 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 critical habitat designations 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 repairs to 11 culverts beneath SR 101 in Mendocino County on the following ESA-listed salmonids and their designated critical habitats:

- NC steelhead DPS, listed as threatened under the ESA (71 FR 834);
- SONCC coho salmon ESU, listed as threatened under the ESA (70 FR 37160); and
- CC Chinook salmon ESU, listed as threatened under the ESA (70 FR 37160).

The action area is within the designated critical habitat listed below:

- NC steelhead critical habitat (70 FR 52488);
- SONCC coho salmon critical habitat (64 FR 24049); and
- CC Chinook salmon critical habitat (70 FR 52488).

A. Species Description and Life History

1. <u>Steelhead</u>

Steelhead are anadromous forms of *O. mykiss*, spending some time in both freshwater and saltwater. Steelhead can be divided into two reproductive ecotypes, based upon their state of sexual maturity at the time of river entry (*i.e.*, winter or summer runs) and the duration of their spawning migration. Winter-run steelhead, the more common form of the two ecotypes, typically migrate upstream during high flow events between November and April. In many streams, the timing of upstream migration begins only after stream flows are high enough to breach the sand bars at the stream mouths. Summer-run steelhead migrate upstream from March through September. In contrast to other species of *Oncorhynchus*, steelhead may spawn more than one

season before dying (iteroparity); although one-time spawners represent the majority (Shapovalov and Taft 1954). Steelhead young usually rear in freshwater for one to three years before migrating to the ocean as smolts 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 (Shapovalov and Taft 1954, Busby *et al.* 1996). The distribution of steelhead in the ocean is not well known. Coded wire tag recoveries indicate most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986).

Outmigration appears to be more closely associated with size than age and a decline in the hydrograph (Shapovalov and Taft 1954). 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) and age 1+ steelhead moving downstream during spring and summer. For steelhead embryos, survival to emergence is inversely related to the proportion of fine sediment in the spawning gravels. Steelhead are slightly more tolerant than other salmonids, with significant reductions in survival when particles less than 0.25 inches in diameter comprise 20 to 25 percent of the substrate. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986). Upon emerging from the gravel, fry rear in edge-water habitats and move gradually to deeper and faster habitats as they grow (Chapman and Bjornn 1969, Everest and Chapman 1972, Smith and Li, 1983). During this period, cover (*i.e.,* overhanging and emergent vegetation, boulders, and woody material) is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Meehan and Bjornn 1991).

As juveniles, steelhead tend to use riffles and other fast water habitats (*i.e.*, runs and heads of pools) during summer where food, in the form of drifting invertebrates, is more abundant (Smith and Li 1983). Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. In winter, juvenile steelhead become less active and hide in available cover, including gravel or woody debris, under cut banks, and dense streamside vegetation. Steelhead typically spend much of their juvenile lifestage in freshwater habitats, particularly inland populations. However, for many coastal systems, the use of estuaries and seasonal lagoons by juvenile salmonids for rearing is much more extensive. Studies have confirmed estuaries (including seasonal, bar-built lagoons) play an important role in the lifecycle of salmonids, particularly steelhead, because they are generally more productive than upstream riverine habitats, growth while rearing in the lagoon is often substantial, and, therefore, size at ocean entry can affect ocean survival (Smith 1990, Bond 2006, Hayes *et al.* 2008, Hayes *et al.* 2011).

In riverine habitats, adequate flow, temperature, and food availability are important factors for survival and growth. Water temperature can influence the metabolic rate, growth, distribution, abundance, and habitat use of rearing juvenile steelhead (Smith and Li 1983, Barnhart 1986, Myrick and Cech 2005, Casagrande 2010). 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). Variability in the diurnal water temperature range is also important for the survivability and growth of salmonids (Hokanson *et al.* 1977, Busby *et al.* 1996). Stream water temperature is regulated by multiple factors including air temperature, stream channel

dimension and orientation, the presence and abundance of riparian vegetation, and stream flow management (Poole and Berman 2001).

Suspended sediment concentrations can also influence the distribution and growth of steelhead (Bell 1973, Sigler *et al.* 1984, Newcombe and Jensen 1996). Elevated suspended sediment concentrations results in a decrease in water clarity, or turbidity, which directly impairs visibility for drift feeding and, depending on the severity and duration, may result in emigration from the area (Sigler *et al.* 1984). As the suspended sediment settles in the stream bed, it can clog the interstitial spaces between coarser substrate, which results in a decline in invertebrate production and a change in community composition (Waters 1995) and impair substrate suitability for spawning and egg survival (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. Coho salmon

The life history of the coho salmon in California has been well documented by Shapovalov and Taft (1954) and Hassler (1987). Coho salmon are semelparous, *i.e.*, they die after spawning. In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple 3-year life cycle (Shapovalov and Taft 1954). Adult salmon typically begin the freshwater migration from the ocean to their natal streams after heavy late-fall or winter rains breach the sand bars at the mouths of coastal streams (Sandercock 1991). Delays in river entry of over a month are not unusual (Salo and Bayliff 1958, Eames *et al.* 1981). Adult returns typically peak in December and January but continue into March, with spawning occurring shortly after arrival to the spawning ground (Shapovalov and Taft 1954).

Upon emergence from the redd, juvenile coho salmon seek out shallow water, usually along stream margins. As they grow, juvenile coho salmon often occupy habitat at the heads of pools, which generally provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992). Chapman and Bjornn (1969) determined that larger juveniles tend to occupy the head of pools, whereas smaller juveniles are found further down the pools. As the fish continue to grow, they move into deeper water and expand their territories until, by July and August, they reside exclusively in deep pool habitat.

Coho salmon are typically associated with small to moderately-sized coastal streams characterized by heavily forested watersheds; perennially-flowing reaches of cool, high-quality water; dense riparian canopy; deep pools with abundant overhead cover; instream cover consisting of large, stable woody debris and undercut banks; and gravel or cobble substrates (Sandercock 1991).

Preferred rearing habitat has little or no turbidity and high sustained invertebrate forage production. Juvenile coho salmon feed primarily on drifting terrestrial insects, much of which are produced in the riparian canopy, and on aquatic invertebrates growing within the interstices of the substrate and in leaf litter in pools and side channels. Juvenile coho salmon prefer well shaded pools at least 1 meter deep with dense overhead cover; abundant submerged cover composed of undercut banks, logs, roots, and other woody debris; and preferred water

temperatures of 12-15° C, but not exceeding 22-25°C for extended time periods (Brett 1952, Bell 1973, Reiser and Bjornn 1979). Growth is slowed considerably at 18°C and ceases at 20°C (Stein *et al*. 1972, Bell 1973). Sedimentation has strong effects on coho salmon as the survival of young coho salmon drops sharply when fines make up 15 percent or more of the substrate (Quinn 2005).

3. Chinook salmon

Chinook salmon are the largest member of the *Oncorhynchus* genus, with adults weighing more than 120 pounds having been reported from North American waters (Scott and Crossman 1973; Page and Burr 1991). Chinook salmon exhibit two main life history strategies: ocean-type fish and river-type fish (Healey 1991; Myers *et al*. 1998). In California, ocean-type fish typically are fall or late fall-run fish that enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of rivers, and spawn within a few weeks of freshwater entry. Juveniles emigrate to estuarine or marine environments shortly after emergence from the redd (Healey 1991). In California, river-type fish are typically winter or spring-run fish that have a protracted adult freshwater residency, sometimes spawning several months after entering freshwater. Progeny of river-type fish frequently spend one or more years in freshwater before emigrating. The low flows, high river temperatures, and sand bars that develop in smaller coastal rivers in California during the summer months favor an ocean-type life history (Kostow 1995). With this life history, smolts typically outmigrate as subyearlings during April through July (Myers *et al*. 1998). The ocean-type Chinook salmon in California tend to use estuaries and coastal areas for rearing more extensively than river-type Chinook salmon. The brackish water areas in estuaries provide rich sources of important lipids and moderate the physiological stress that occurs during parr-smolt transitions.

Fry emergence begins in December and continues into mid-April (Leidy and Leidy 1984). Emergence can be hindered if the interstitial spaces in the redd are not large enough to permit passage of the fry. In laboratory studies, Bjornn and Reiser (1991) observed that Chinook salmon and steelhead fry had difficulty emerging from gravel when fine sediments (6.4 millimeter (mm) or less) exceeded 30-40 percent by volume. After emergence, Chinook salmon fry seek out areas behind fallen trees, back eddies, undercut banks and other areas of bank cover (Everest and Chapman 1972). As they grow larger, their habitat preferences change. Juveniles move away from stream margins and begin to use deeper water areas with slightly faster water velocities, but continue to use available cover to minimize the risk of predation and reduce energy expenditure. Fish size appears to be positively correlated with water velocity and depth (Chapman and Bjornn 1969, Everest and Chapman 1972). Optimal temperatures for both Chinook salmon fry and fingerlings range from 12-14 °C, with maximum growth rates at 12.8 °C (Boles 1988). Chinook salmon feed on small terrestrial and aquatic insects and aquatic crustaceans. Cover, in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks provide food, shade, and protect juveniles from predation.

B. Status of Species and Critical Habitat

In this opinion, NMFS assesses four population viability parameters to help us understand the status of the NC steelhead DPS and the SONCC coho salmon ESU and the ability of these

populations 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/ESU.

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. Status of the NC Steelhead DPS

Historically, the NC steelhead DPS was comprised of 38 independent populations (16 functionally and 22 potentially independent) of winter run steelhead and 10 functionally independent populations of summer run steelhead (Spence *et al.* 2012). Based on the limited data available (dam counts of portions of stocks in several rivers), NMFS' initial status review of NC steelhead (Busby *et al*. 1996) determined that population abundance was very low relative to historical estimates (1930s and 1960s dam counts), and recent trends were downward in most stocks. Overall, population numbers are severely reduced from pre-1960s levels, when approximately 198,000 adult steelhead migrated upstream to spawn in the major rivers of this DPS (Busby *et al*. 1996, 65 FR 36074).

Updated status reviews reached the same conclusion, and noted the poor amount of data available, especially for winter run steelhead (NMFS 1997, Adams 2000, Good *et al*. 2005). The information available suggests that the DPS population growth rate is negative. Comprehensive geographic distribution information is not available for this DPS, but steelhead are considered to remain widely distributed (NMFS 1997a). It is known that dams on the Mad River and Eel River block large amounts of habitat historically used by NC steelhead (Busby *et al*. 1996, Spence *et al.* 2008). Also, hatchery practices in this DPS have exposed the wild population to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead. Historical hatchery practices at the Mad River hatchery are of particular concern, and included out-planting of non-native Mad River hatchery fish to other streams in the DPS and the production of non-native summer steelhead (65 FR 36074). The conclusion of the 2005 status review (Good *et al*. 2005) echoes that of previous reviews. Abundance and productivity in this DPS are of most concern, relative to NC steelhead spatial structure (distribution on the landscape) and diversity (level of genetic introgression). The lack of data available also remains a risk because of uncertainty regarding the condition of some stream populations.

Adult returns of NC steelhead during 2007/08 were considered average for the last decade, data from the 2008/09 adult NC steelhead were lower and indicate populations remained suppressed across much of their range compared to historic amounts. However, returns during the 2009/10 and preliminary data on the 2010/11 returns indicate increases in many populations of NC

steelhead compared to the previous two years (Jeffrey Jahn, personal communication, 2011). The most recent status review update by Williams *et al.* (2011) reports a mixture of patterns in population trend information, with more populations showing declines than increases. Although little information is available to assess the status for most population in the NC steelhead DPS, overall Williams *et al.* (2011) found little evidence to suggest a change in status compared to the last status review by Good *et al.* (2005). Based on this information, NMFS chose to maintain the listing status of NC steelhead as threatened (NMFS 2011, 76 FR 76386).

2. Status of the SONCC coho salmon ESU

A comprehensive review of estimates of historic abundance, decline, and present status of coho salmon in California is provided by Brown *et al.* (1994). They estimated that the coho salmon annual spawning population in California ranged between 200,000 and 500,000 fish in the 1940s, which declined to about 100,000 fish by the 1960s, followed by a further decline to about 31,000 fish by 1991. Brown *et al.* (1994) concluded that the California coho salmon population had declined more than 94 percent since the 1940s, with the greatest decline occurring since the 1960s. More recent population estimates vary from approximately 600 to 5,500 adults (Brown *et al.* 1994). Available information suggests that SONCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative) and has experienced many local extirpations (NMFS 2001, Good *et al.* 2005). In addition, SONCC coho salmon have experienced range constriction, fragmentation, and a loss genetic diversity. Many subpopulations that may have acted to support the species' overall numbers and geographic distribution have likely been lost. While the amount of data supporting these conclusions is not extensive, NMFS is unaware of information that suggests a more positive assessment of the condition of the SONCC coho salmon ESU and its critical habitat. Recent status reviews for SONCC coho salmon conclude that this ESU is presently —likely to become endangered (NMFS 2001, Good *et al.* 2005). In 2005 NMFS evaluated the listing status of SONCC coho salmon and maintained the threatened status of SONCC coho salmon (70 FR 37160). The most recent status review conducted by NMFS Southwest Fisheries Science Center (Williams *et al.* 2011) raises concerns regarding recent negative population trends across the ESU, but does not suggest a change in extinction risk for the SONCC coho salmon ESU. Negative trends in the last five years are likely due to the apparent low marine survival that have contributed to observed declines in SONCC coho salmon (Williams *et al.* 2011).

3. Status of the CC Chinook salmon ESU

The CC Chinook salmon ESU was historically comprised of approximately 38 Chinook salmon populations (Spence *et al*. 2008). Many of these populations (about 21) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts. The remaining populations were likely more dependent upon immigration from nearby independent populations than dependent populations of other salmonids (Spence *et al*. 2008).

Data on CC Chinook abundance, both historical and current, are sparse and of varying quality (Bjorkstedt *et al*. 2005). Estimates of absolute abundance are not available for populations in this ESU (Myers *et al.* 1998). In 1965, CDFG (1965) estimated escapement for this ESU at over

76,000. Most were in the Eel River (55,500), with smaller populations in Redwood Creek (5,000), Mad River (5,000), Mattole River (5,000), Russian River (500) and several smaller streams in Humboldt County (Myers *et al.* 1998). Currently available data indicate abundance is far lower, suggesting an inability to sustain production adequate to maintain the ESU's populations. Recent growth rates are negative for Chinook salmon coast-wide in California. For example, in 2007, 2008, and 2009, dramatic declines in Chinook salmon returns occurred throughout California (Lindley *et al.* 2009).

CC Chinook salmon populations remain widely distributed throughout much of the ESU. Notable exceptions include the area between the Navarro River and Russian River and the area between the Mattole and Ten Mile River populations (Lost Coast area). The lack of Chinook salmon populations both north and south of the Russian River (the Russian River is at the southern end of the species' range) makes it one of the most isolated populations in the ESU. Myers *et al*. (1998) reports no viable populations of Chinook salmon south of San Francisco, California.

Because of their prized status in the sport and commercial fishing industries, CC Chinook salmon have been the subject of many artificial production efforts, including out-of-basin and out-of-ESU stock transfers (Bjorkstedt *et al.* 2005). It is, therefore, likely that CC Chinook salmon genetic diversity has been significantly adversely affected despite the relatively wide distribution of populations within the ESU. An apparent loss of the spring-run Chinook life history in the Eel River Basin and elsewhere in the ESU also indicates risks to the diversity of the ESU.

Data from the 2009 adult CC Chinook salmon return counts and estimates indicated a further decline in returning adults across the range of CC Chinook salmon on the coast of California (Jeffrey Jahn, NMFS, personal communication 2010). Ocean conditions are suspected as the principal short term cause because of the wide geographic range of declines (Lindley *et al.* 2009). However, the number of adult CC Chinook salmon returns in the Russian River Watershed increased substantially in 2010/11 and 2011/12, compared to the 2008/09 and 2009/10 returns.[1] In the Eel River Watershed, adult CC Chinook salmon returns during the fall-winter of 2012/2013 were the highest observed in since the 1930's. Increases in adult Chinook salmon returns during 2010/11 and 2011/12 have been observed in the Central Valley populations as well. These numbers must be taken in context of the overall Chinook salmon abundance in the ESU which has recently been reviewed by Williams *et al.* (2011), who found no evidence of a substantial change in the status of the CC Chinook ESU since the last status review by Good *et al.* (2005). Based on this information, NMFS chose to maintain the threatened listing of CC Chinook salmon (NMFS 2011, 76 FR 50447).

4. <u>Status of Critical Habitat</u>

The condition of NC steelhead, SONCC coho salmon, and CC Chinook salmon critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human-induced factors affecting

[1] http://www.scwa.ca.gov/chinook/

critical habitat: logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered stream bank and channel morphology, reduced in-stream flow and habitat availability, elevated water temperatures, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, decline in substrate quality caused by sedimentation, and lost riparian vegetation (Busby *et al.* 1996, 64 FR 24049, 70 FR 37160, 70 FR 52488, and Williams *et al.* 2011). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESUs/DPS. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish. Meanwhile, many dams and other structures reduce access to historic spawning and rearing habitat. Two populations, the Mad River and Upper Eel River, have lost considerable amounts of historic habitat due to dams (Spence *et al.* 2008). Hatchery practices in this DPS have exposed the wild population to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead (65 FR 36074, Williams *et al.* 2011).

C. Factors Responsible for Decline

NMFS cites many, primarily anthropogenic, reasons for the decline of NC steelhead and SONCC coho salmon (Busby *et al.* 1996, Good *et al.* 2005, Williams *et al.* 2011). The foremost reason for decline is the loss, 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 all salmonid stocks are predation by marine mammals (NMFS 1997b, Wright *et al.* 2007) and other introduced fish species (*e.g.*, Sacramento pikeminnow, *Ptychocheilus grandis* in the Eel River drainage), reduced marine-derived nutrient transport (Bilby *et al.* 1996, Bilby *et al.* 1998, Gresh *et al.* 2000, Moore *et al.* 2011), and recently poor ocean conditions (Lindley *et al.* 2009). [2]

D. 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

[2] Other factors, such as over fishing and artificial propagation have also contributed to the current population status of these species. All these human induced factors have exacerbated the adverse effects of natural environmental variability from such factors as drought and poor ocean conditions.

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 salmonids are likely to experience changes in temperatures, circulation and chemistry, and food supplies (Feely *et al.* 2004, Brewer and Barry 2008, Osgood 2008, Turley 2008, Karl *et al.* 2009). 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 action area for the original consultation includes 11 sites on the SR 101 corridor. Some of the sites are located within the Outlet Creek drainage, a tributary to the mainstem Eel River (ER), Mendocino County, while others are located in the Tenmile and Rattlesnake sub-basins of the South Fork Eel River (SF) also in Mendocino County. With the exception of the Tenmile Creek culvert location, the remaining projects are located on unnamed, non-fish bearing, and ephemeral tributaries. Specific locations for the 10 sites are as follows: PM 46.24 – unnamed tributary to Baechtel Creek (MF); PM 54.20 – unnamed tributary to Reeves Canyon Creek (ER); PM 57.54 – unnamed tributary to Outlet Creek (ER); PM 57.58 – unnamed tributary to Outlet Creek (ER); PM 57.63 – unnamed tributary to Outlet Creek (ER); PM 58.59 – unnamed tributary to Outlet Creek (ER); PM 58.82 – unnamed tributary to Outlet Creek (ER); PM 79.79 – unnamed tributary to Rattlesnake Creek (SF); PM 79.88 – unnamed tributary to Rattlesnake Creek (SF); and PM 81.30 – unnamed tributary to Rattlesnake Creek (SF).

As of December 2012, none of the original 10 actions listed above have been constructed. As mentioned above, Site PM 46.24 on an unnamed tributary to Baechtel Creek, has been withdrawn by Caltrans and will not be constructed because it lies outside of Caltrans' right-of-way (Al Kannely, Caltrans, personal communication, December 2012). PM 54.20 is located on an ephemeral tributary to Reeves Canyon Creek. Reeves Canyon Creek is an intermittent tributary to Outlet Creek, a perennial tributary to the mainstem Eel River. The culvert location in the Reeves Creek tributary is located upstream of the known distribution for steelhead, Chinook salmon, and coho salmon.[3] PM 58.82 is also located in a steep, ephemeral tributary to Outlet Creek with no suitable habitat for salmonids. PM 79.88 and PM 81.30 are located in ephemeral tributaries to Rattlesnake Creek, a perennial tributary to the South Fork Eel River. Like Tenmile

[3] http://coastalwatersheds.ca.gov/portals/1/Watersheds/NorthCoast/Outlet/docs/Draft_Middle_Subbasin_pgs135-165.pdf

Creek, it is an eastern sub-basin stream and has similar environmental conditions (described below). These ten projects are all located in non-fish bearing streams which do not contain habitat suitable for salmonids. However, because they are accessible to and within the historic range of SONCC coho salmon, these creeks are designated critical habitat for that ESU. Aside from the Tenmile Creek site, none of the small creeks at the other 10 project locations have been designated as critical habitat for the NC steelhead DPS or the CC Chinook salmon ESU.

The portion of the action area in Tenmile Creek is located in the upper reaches of Tenmile Creek, a large tributary to the South Fork Eel River, where it crosses beneath SR 101. This site is located approximately 93,000 feet upstream of the confluence with the South Fork Eel River (CDFG 2009), and has a drainage area of approximately four square miles with approximately three and a half miles of habitat upstream. California Department of Fish and Game (CDFG, now CDFW) classified this reach of Tenmile Creek as an F4 channel type under the Rosgen Channel Classification (CDFG 2009). An F4 channel is entrenched with meandering riffle/pool habitats in low gradient channels with high width/depth ratios and gravel-dominant substrates. Overall, the Tenmile Creek Watershed contains approximately 22 stream miles and drains approximately 64 square miles of the eastern sub-basin of the South Fork Eel River watershed, which is relatively warmer and drier than the western and northern basins. Vegetation in the eastern basin is dominated by grass hill-slope prairies and oak-shrub woodlands mixed with Douglas fir forests.

The Tenmile Creek culvert underneath SR 101, consists of an 80.5-foot long double reinforced concrete box culvert (*i.e.,* two separate barrels), which was constructed in 1953. Both barrels are 10 feet wide and 7 feet tall. The culvert is skewed approximately 13.5 degrees right to SR 101 and lays on a 0.5 percent grade. The channel grade upstream and downstream of the culvert is relatively flat, ranging from 0.25 to 0.5 percent gradient. Both the inlet and outlet have concrete wingwalls. Approximately 36 feet downstream of the culvert outlet, five old sections of abandoned retaining walls/abutments from a previous highway alignment lie within the channel. The failed wall pieces currently provide channel complexity including beneficial scour pools and cover. The California Department of Fish and Wildlife (CDFW) has requested the failed wall pieces be left in the channel (Caltrans 2009). The existing culvert adequately passes the 100 year storm event.

A. Status of Critical Habitat in the Tenmile Creek Portion of the Action Area

As discussed above, Tenmile Creek is within the eastern sub-basin of the South Fork Eel River watershed and, therefore, experiences warmer daytime air temperatures, drier winters, and naturally has a more limited forest cover. During the dry season, stream flow in the upper reaches of Tenmile Creek is limited and in the action area is typically reduced to disconnected pools by mid-summer – many of which dry by the end of summer or early fall. The California Conservation Corps (CCC) conducted a stream inventory assessment in 1996 (CCC 1996) and noted that water temperatures may limit the fishery. During the surveys throughout Tenmile Creek in June and July 2009, water temperatures ranged from 64 to 82 °F, while air temperatures ranged between 53 and 95 °F (CDFG 2009). Both CCC (1996) and CDFG (2009a) have recommended increasing canopy cover over the stream channel as well as addressing sources of fine sediment. As of 2009, the average canopy cover over the reach, which includes the action

area, was 55.2 percent. Observations of bank erosion and sedimentation in the channel were common in the upper reaches of the creek (CDFG 2009). Fish passage is also impaired through the double box culvert beneath SR 101.

Based on the above information, NMFS believes the overall PCEs for juvenile rearing in this portion of the action area are somewhat degraded because some essential elements (*e.g.*, degraded substrate, seasonally elevated water temperatures, low summer stream flow volume) have likely been impacted by past ranching, logging, and rural residential development (*i.e.*, localized water withdrawals). The PCEs for spawning habitat in this portion of the action area are also somewhat degraded based on degraded substrate conditions in the action area (CCC 1996, CDFG 2009). Finally, the PCEs for migration through the action area are also impaired due to the partial barrier caused by the culvert at SR 101.

B. Status of Critical Habitat in the Action Area outside of the Tenmile Creek site

The 10 other locations within the action area are all located in small, un-named, and ephemeral tributaries to Rattlesnake Creek, Outlet Creek, and Reeves Canyon Creek (a tributary to Outlet Creek) (see the Environmental Baseline). Due to their small, ephemeral nature, these streams do not provide PCEs for spawning, rearing and migration for the SONCC coho salmon ESU.

C. Status of NC Steelhead, SONCC Coho Salmon, and CC Chinook salmon within the Tenmile Creek Portion of the Action Area

There have been few recent assessments of salmonid abundance in the upper reaches of Tenmile Creek. However, there are several accounts of relative juvenile steelhead and coho salmon abundance from Tenmile Creek as a whole, which are summarized in Becker and Reining (2009). In 1940, CDFG surveyed Tenmile Creek and found steelhead present, including one 25-inch adult. Spawning areas were considered to be excellent. Large numbers of juvenile steelhead were rescued from Tenmile Creek in 1951 (2,250 fish) and 1953 (9,221 fish). A section of the creek approximately one mile upstream of its confluence with the South Fork Eel River was surveyed in 1959 by CDFG and juvenile steelhead, ranging from two to five inches, were “very common”. A downmigrant study on Tenmile Creek was conducted in 1966 at a site located approximately six miles north of Laytonville (approximately nine stream miles downstream of the action area). Steelhead were “commonly captured from March through July”. In 1996, the CCC electrofished three sites in Tenmile Creek and found 0+, 1+, and 2+ steelhead to be present.

Coho salmon were historically abundant in the Tenmile Creek sub-watershed. For example, approximately 3,475 juveniles were found in Tenmile Creek 1951, and 4,369 were found in 1952 (Yoshiyama and Moyle 2010). Presently, much of the suitable habitat in the Tenmile Creek subbasin is located downstream of the action area; although NMFS’ map of intrinsic potential habitat (Figure 41-1 in NMFS 2012) shows some high quality habitat upstream of the action area as well.

Several tributaries to Tenmile Creek have also been found to support juvenile salmonids, including steelhead and coho salmon of various densities (Becker and Reining 2009, CDFG

2009, Yoshiyama and Moyle 2010). These tributaries join Tenmile Creek downstream of the action area.

Most recently, CDFG conducted extensive habitat and biological surveys throughout Tenmile Creek in June and July 2009 (a dry year). Select pools were snorkel surveyed from the confluence with the South Fork Eel River upstream approximately 73,771 feet (SR 101 crosses Tenmile Creek at approximately 93,000 feet upstream of the South Fork Eel River confluence), which resulted in several hundred juvenile steelhead consisting of multiple year classes. In the reach closest to the action area (upstream most site), 8 Age 0+, 3 Age 2+ steelhead and no coho salmon were observed. On June 22, 2011 (a wet year), CDFG staff snorkel surveyed a short section of Tenmile Creek located approximately 0.5 miles downstream of the proposed action area. Four pools were snorkeled all of which had juvenile steelhead and coho salmon present for a total of 55 juvenile steelhead and 25 coho salmon observed (CDFG 2011). In addition, two Chinook salmon smolts were observed in one pool at the upstream end of the reach. CDFG (2011) also noted that the adjacent landowners indicated the creek channel in that area of the watershed completely dries during summer.

Based on the limited sampling conducted to date in reaches downstream, and the current condition of the action area where fish relocation would occur (*i.e.*, one pool at the culvert inlet), NMFS anticipates juvenile steelhead, coho salmon, and Chinook salmon may be present but in relatively low abundances. Their abundance in the pool will ultimately depend on its wetted extent at the time of construction. Based on the 2011 data described above and considering annual variation in precipitation and juvenile salmonid production, NMFS anticipates up to 25 juvenile steelhead, 10 juvenile coho salmon, and 5 Chinook salmon may be present in the action area during construction.

D. Factors Affecting Species Environment within the Action Area

Threats to salmonids and riparian habitat quality in Tenmile Creek, including the Tenmile Creek portion of the action area, include water diversions, fine sediment accumulation in the channel from bank erosion, rural roads, ranching, and rural residential development, as well as fish passage constraints at the SR 101 culvert.

E. 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 future in the action area, including the portion in the Tenmile Creek Watershed. Based on NOAA's Authorizations and Permits for Protected Species (APPS) website[4], there are currently four active section 10(a)(1)(A) research and enhancement permits issued that authorize research on salmonids in the South Fork Eel River Watershed (including Tenmile Creek). These permits are: Permit 1181 Modification 1 issued to the Mendocino Redwood Company, Permit 10093 issued to CDFW Region 1, Permit 1044 Modification 4 issued to NMFS's Southwest Fisheries Science Center, and Permit 14513

[4] https://apps.nmfs.noaa.gov/search/search.cfm

issued to Dr. Carlson of University of California, Berkeley. To date, NMFS is unaware of any sampling in Tenmile Creek under these permits.

One project (Permit 16894) was authorized under CDFW's 2012 4(d) research program for research on steelhead and coho salmon in the South Fork Eel River drainage, including Tenmile Creek. Data from the 2012 sampling season have not been made available as of November 2012. In general, all research activities are closely monitored and require measures to minimize take during the research activities. These research activities are not anticipated to jeopardize listed salmonids or adversely modify their critical habitats.

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 NC steelhead, SONCC coho salmon, and CC Chinook salmon. Data to quantitatively determine the precise effects of the proposed action on NC steelhead, SONCC coho salmon, and CC Chinook salmon 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 salmonid 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.

Project activities at sites other than the one in Tenmile Creek are anticipated to have insignificant or discountable effects on listed salmonids and SONCC coho salmon critical habitat. Culvert repair and maintenance may disturb banks and may mobilize sediment resulting in minor and temporary increases in turbidity following the first rains. However, construction BMPs are expected to minimize erosion and reduce sediments from entering channels and minimize any minor and temporary increases in turbidity. In addition to BMPs, Caltrans will also require a Storm Water Pollution and Prevention Plan (SWPPP) from their contractor that will prevent all construction materials, debris, and petroleum products from entering surface waters. Increased levels of turbidity may affect listed fish species by disrupting normal feeding behavior, reducing growth rates, increasing stress levels, and reducing respiratory functions. NMFS expects that the measures Caltrans will take to reduce turbidity combined with the location of project sites away from areas that contain salmonids at any time of the year will result in insignificant increases in turbidity or sedimentation downstream where salmonids occur.

Primary constituent elements of designated critical habitat for listed salmonids at sites in the project area other than the one in Tenmile Creek include water quality and quantity, foraging habitat, and migratory corridors free of obstructions. The potential effects of this project to designated critical habitat for listed salmonids include minor, short-term disturbance of the bed

and banks and vegetation associated with accessing the project sites. Placement of the various culvert inserts, replacement of some culverts, and construction of wing walls will create minimal and localized temporary disturbance to the substrate and increased turbidity, as discussed previously. The culvert repairs are expected to prevent future performance failures that could lead to increased sediment releases and bank failures. Overall, the anticipated impacts to water quality in these ephemeral streams are expected to be minimal (if any), and insignificant, because the sites will be dry during construction, the activities will occur at small areas within each site, construction activities will be brief at each site, there will be no use of equipment in a wetted channel, and Caltrans will use various forms of construction BMPs. While the removal of riparian vegetation temporarily reduces shading and sources of allochthonous inputs to the stream, the amount of riparian vegetation that will be removed at each site will be minimal and NMFS anticipates the regrowth of riparian vegetation will occur quickly. Since the existing culverts have deteriorated, nearby banks are potentially unstable and without intervention could become sources of fine sedimentation to the stream which would degrade aquatic habitat. When the project is completed, no ongoing adverse impacts to designated critical habitat are expected at these project sites.

A. Fish Capture and Relocation in Tenmile Creek

The scour prevention repairs to the Tenmile Creek culvert beneath SR 101 will require dewatering of the pool area at the culvert inlet, and, therefore, fish capture and relocation will be necessary. Prior to dewatering, a NMFS-approved fisheries biologist will capture and relocate salmonids trapped in pools 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 pools. All salmonids captured will be relocated to the nearest suitable location. As described above in the *Environmental Baseline*, NMFS expects the total number of juvenile salmonids likely to be present in the action area to be low and no more than 25 steelhead,10 coho salmon, and 5 Chinook salmon.

Fish capture and relocation activities pose a risk of injury or mortality to fish species. Caltrans proposes to use seines or backpack electrofishing to capture and relocate steelhead from the pool. 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 CDFW and NMFS guidelines, direct effects to and mortality of salmonids during capture will be minimized. Data from years of similar salmonid relocation activities using CDFW and NMFS guidelines indicate average mortality rate is below one percent (Collins 2004; CDFG 2005, 2006, 2007, 2008, 2009b, 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, one juvenile coho salmon, and one Chinook salmon smolt.

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 the diversion facilities are removed, juvenile salmonid 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 salmonids by removing them from areas where they would have experienced high rates of injury and mortality.

B. Dewatering in Tenmile Creek

Dewatering is expected to have direct effects on juvenile salmonids. The primary effect will be attributed to stranding during dewatering. Caltrans has proposed to drain the pool down using pumps fitted with the appropriate sized screens (*e.g.*, 0.2 inch mesh). Juvenile salmonids that avoid capture prior to the implementation of 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. Because of fish relocation efforts, NMFS expects the number of juvenile steelhead and coho salmon 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, one coho salmon, and one Chinook salmon. 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.

Turbidity is not expected to appreciably impact juvenile salmonids within the action area or in downstream reaches of Tenmile Creek. If present, salmonids are likely to only be exposed to minor and temporary periods of elevated turbidity during the actual fish relocation activities due to stirring up the pool bottom while capturing fish. Dewatering and construction will not proceed until the creek has dried to isolated pools and, therefore, turbid water will not flow downstream and affect other reaches of the creek. Water from the scour pool will be pumped to an upland area where it will either be allowed to percolate into the ground or will be stored in tanks and removed from the project area.

Another manner by which 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 (0.2 inches), to ensure salmonids will not be harmed by the pumps during dewatering events.

C. Habitat Loss in Tenmile Creek

Impacts to riparian and upland habitat will occur as a result of the temporary loss of vegetation within the footprint of the proposed project channel access. 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, Poole and Berman 2001). Small streams and those with minimal flows are especially

sensitive to the 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 understory vegetation will be preserved to the greatest extent possible by pruning individual plants to within a few inches of the ground which allow natural regeneration to occur following construction. As described above, at least four and as many as seven trees of various species may need to be removed in order to obtain access to the creek channel depending on the final width of the access road (11 or 18 feet). These are young trees which range in size from 2 to 12.5 inches DBH. The four trees that are certain to be removed are 5.5 inches DBH or less. All removed trees will be replaced on site. Because of the small area affected, young age of the trees to be removed, and the proposed replanting of trees, NMFS does not expect the effects of the small number of trees and understory species removed or trimmed along the bank of Tenmile Creek at SR 101 will result in appreciable impacts to designated critical habitat.

The placement of rock below the existing grade of the scour pool upstream of the culvert is unlikely to result in any long-term detrimental impacts to the quality of critical habitat in the action area. Caltrans has designed the scour repair measures in order to preserve the pool at the head of the culvert; as opposed to filling it in with rock. This maintains a resting spot for adult salmonids at the upstream end of the culvert and provides habitat complexity in the channel.

The addition of one rock weir located downstream of the culvert outlet at a naturally formed cobble bar will improve fish passage conditions through the culvert.

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 has informed NMFS that there are no 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. In the long term, NMFS expects global climate change is likely to produce temperature and precipitation changes. These changes may adversely affect listed salmonids in the action area.

VIII. INTEGRATION AND SYNTHESIS

The NC steelhead DPS, SONCC coho salmon ESU, and CC Chinook salmon ESU are listed as threatened. Throughout each DPS and ESU, including the greater South Fork Eel River Watershed, stream habitat has been significantly impacted by multiple anthropogenic activities (*i.e.*, logging, rural residential development, agriculture, and dams). These have contributed to

declines in the abundance of all three species in many of the watersheds in this region (Good *et al.* 2005, Williams *et al.* 2011). There is a paucity of data on salmonid abundance within the Tenmile Creek portion of the action area during the dry season. This is the only portion of the action area that contains listed salmonids. The activities proposed for the 10 other project sites are unlikely to adversely affect listed salmonids or their critical habitat as described above.

The portion of the action area in Tenmile Creek is within the upper reaches of the creek where stream flow is reduced to isolated pools by the middle of summer. However, recent observations indicate that a small number of juvenile salmonids are present in these pools in at least some years (Alfred Kannely, Caltrans, personal observation and communication, September 2012). Based on current habitat conditions, the recent observations, and the life-histories of the three ESA-listed salmonid species, NMFS expects juvenile steelhead, coho salmon, and possibly Chinook salmon may be present in fairly low abundance prior to project implementation in Tenmile Creek.

During dewatering of the Tenmile Creek work site, fish rescue and relocation efforts will take place. If present, NMFS anticipates no more than 25 juvenile steelhead, 10 juvenile coho salmon, and 5 Chinook salmon may be adversely affected by work at this project site, and no more than 2 juvenile steelhead, 2 coho salmon, and 2 Chinook salmon will die as a result of the proposed activities. As noted above, the Tenmile Creek portion of the action area is located in the upper reaches of the creek and upstream of all major tributaries, and, therefore, a substantial amount of the watershed's rearing habitat, and presumably the salmonids utilizing these areas will not be affected by the proposed action in Tenmile Creek. The number of each species likely to be present in the action area during the proposed project will represent a very small proportion of the overall abundance in the Tenmile Creek subwatershed. It is unlikely the small potential loss of no more than two individuals of each species as a result of project activities in Tenmile Creek will impact future adult returns to Tenmile Creek or the South Fork Eel River drainage, due to the relatively large number of juveniles produced by each spawning pair, the plasticity of the steelhead life-history, and the larger amount of rearing habitat in the watershed that will be unaffected. When added to the insignificant impacts of the other project sites, NMFS does not believe the project will appreciably diminish the abundance, productivity, diversity, or spatial structure of the NC steelhead DPS, SONCC coho salmon ESU, or the CC Chinook salmon ESU.

As discussed above, the placement of rock in the scour pool's bottom and during the construction of a small rock weir is unlikely to result in any long-term, detrimental impacts to the quality of critical habitat in the action area in Tenmile Creek because the cobbles and larger rocks are naturally common in this portion of the action area, and the existing channel dimensions, including the pool at the culvert inlet, will be preserved. Furthermore, fish passage through the culvert will be enhanced which will improve access to additional spawning and rearing habitat upstream. No adverse changes in stream flow will occur, however the duration of connected flow through the culvert is expected to improve due to the construction of the small rock weir downstream. When these impacts are added to the insignificant impacts expected from the other project sites, NMFS believes the overall effects will not result in any long-term impacts to the PCEs of designated 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' proposed repairs at 11 culverts associated with Hwy 101, between Post Mile (PM) 46.24 and PM 84.52, in Mendocino County, California is not likely to jeopardize the continued existence of the NC steelhead DPS, the SONCC coho salmon ESU, or the CC Chinook salmon ESU.

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 repairs at 11 culverts associated with Hwy 101, between Post Mile (PM) 46.24 and PM 84.52, in Mendocino County, California is not likely result in the destruction or adverse modification of critical habitat designated for the NC steelhead DPS, SONCC coho salmon ESU, or the CC Chinook salmon ESU.

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) fail to assume and implement the terms and conditions or (2) fail 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 NC steelhead and SONCC coho salmon that may be incidentally taken by capture and relocation

during project activities in Tenmile Creek is expected to be no more than 25 juvenile steelhead, 10 juvenile coho salmon, and 5 Chinook salmon. NMFS anticipates no more than two individuals of these species 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 25 juvenile steelhead or if more than 10 juvenile coho salmon, or if more than 5 Chinook salmon are captured or if more than two of any of these species are killed during capture/relocation and channel dewatering activities.

B. Effect of the Take

In the accompanying opinion, NMFS determined this level of anticipated take is not likely to result in jeopardy to NC steelhead, SONCC coho salmon, or CC Chinook salmon.

C. Reasonable and Prudent Measures

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

1. Undertake measures to ensure harm and mortality to listed salmonids resulting from fish relocation in Tenmile Creek is low;

2. Undertake measures to maintain water quality conditions and riparian habitat conditions at pre-construction levels to avoid or minimize harm to steelhead and coho salmon in Tenmile Creek;

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 in Tenmile Creek. Notify NMFS when project activities are scheduled to begin in Tenmile Creek.

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 at the Tenmile Creek project site and ensure they are followed for the length of the project.

    b. 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.

c. 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. Captured salmonids will be released into the nearest suitable habitat.

d. 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 salmonids 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 salmonids.

2. The following terms and conditions implement Reasonable and Prudent Measure 2.

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, 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. Caltrans will provide NMFS with a summary report by January 15 of the year following the completion of fish capture and relocation efforts. The report will 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 the NMFS North Central Coast Office (see address below).

h. All interim and final reports describing the implementation of re-vegetation activities will be submitted to NMFS at the address below by January 15 of the year following the end of each monitoring period, including the final assessment.

i. 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 Northern California Recovery Domain.

XII. REINITIATION NOTICE

This concludes formal consultation for Caltrans' proposed scour repair and fish passage enhancement project at the Tenmile Creek culver beneath SR 101 in Mendocino 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.

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XV. PERSONAL COMMUNICATIONS AND OBSERVATIONS

Alfred Kannely. 2012. Caltrans, Personal Observation.

Jeffrey Jahn, NMFS, personal communication, 2010.

Jeffrey Jahn, NMFS, personal communication, 2011.

Memorandum

Flex your power!
Be energy efficient!

To: MASTRI ALVANDI
BRANCH CHIEF
North Region Design Branch M-5

Date: September 26, 2013

Attn: Kidianga Tshiunza, Project Engineer

File: 01-MEN-101-PM 46.2/84.6
EA: 01-402801
EFIS ID: 01000001561
Culvert Rehabilitation

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
OFFICE OF GEOTECHNICAL DESIGN NORTH BRANCH B

Subject: Geotechnical Recommendations, PM 76.62

DISSCUSSION

Design Branch M-5 (Marysville) requested a subsurface investigation and geotechnical recommendations regarding the use of the Jack and Bore method to replace a culvert on MEN 101 at PM 76.62 (Figure 1). The proposal is to jack a 30 inch by 148 foot welded steel pipe (0.375 inches thick) in a location ten feet to the north of, and parallel to, the existing 18 inch pipe. As proposed, the new pipe would be emplaced on original ground through the base of the existing fill, and the existing 18 inch pipe would be abandoned. (Figure 2).

On August 13 and 14, 2013, the Office of Geotechnical Design North Branch B drilled four borings to depths of 30.8 feet to 31.5 feet, one in each of the three lanes and one in the right-side turnout (Figure 2). The borings were advanced using a truck mounted CS-2000 drill rig with a self-casing wireline drilling method. We performed Standard Penetration Tests (SPT) at five-foot intervals in all borings. We collected and described soil and rock samples on site.

The alignment of the proposed pipe is approximately at the contact between the fill and the underlying, decomposed mélange of the Franciscan Complex (Appendix 1, Boring Records).

RECOMMENDATION

Based on the Boring Records (Appendix 1), we recommend the welded steel pipe be emplaced by standard jack and bore method, which will require horizontal auger boring through the 30-inch welded steel pipe.

Report by:

Reviewed by:

DAWN MCGUIRE, C.E.G. #2280
Engineering Geologist
Office of Geotechnical Design - North
Branch B

CHARLIE NARWOLD, C.E.G. #2335
Senior Engineering Geologist
Office of Geotechnical Design - North
Branch B

FIGURES
Figure 1. Location map
Figure 2. Plan map and cross section showing boring locations

APPENDIX 1
Boring Records, RC-13-001 through RC-13-004

cc: OGDN Project File
Frank Demling, Project Manager

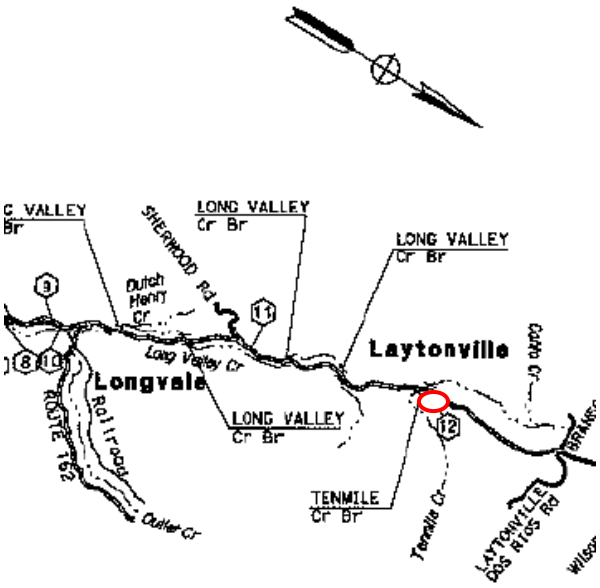


Figure 1. – Location of proposed project at MEN 101 PM 76.62.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Men	101	50.2/84.6		

REGISTERED CIVIL ENGINEER 6-25-13 DATE

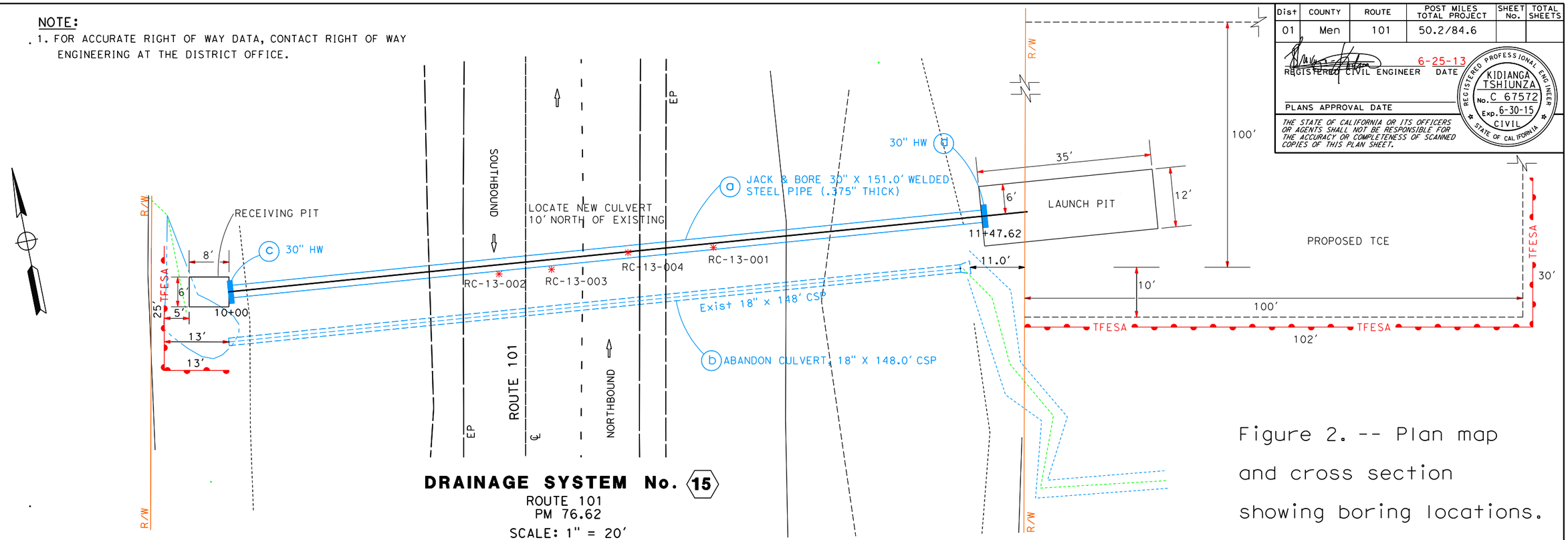
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER KIDIANGA TSHIUNZA No. C 67572 Exp. 6-30-15 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

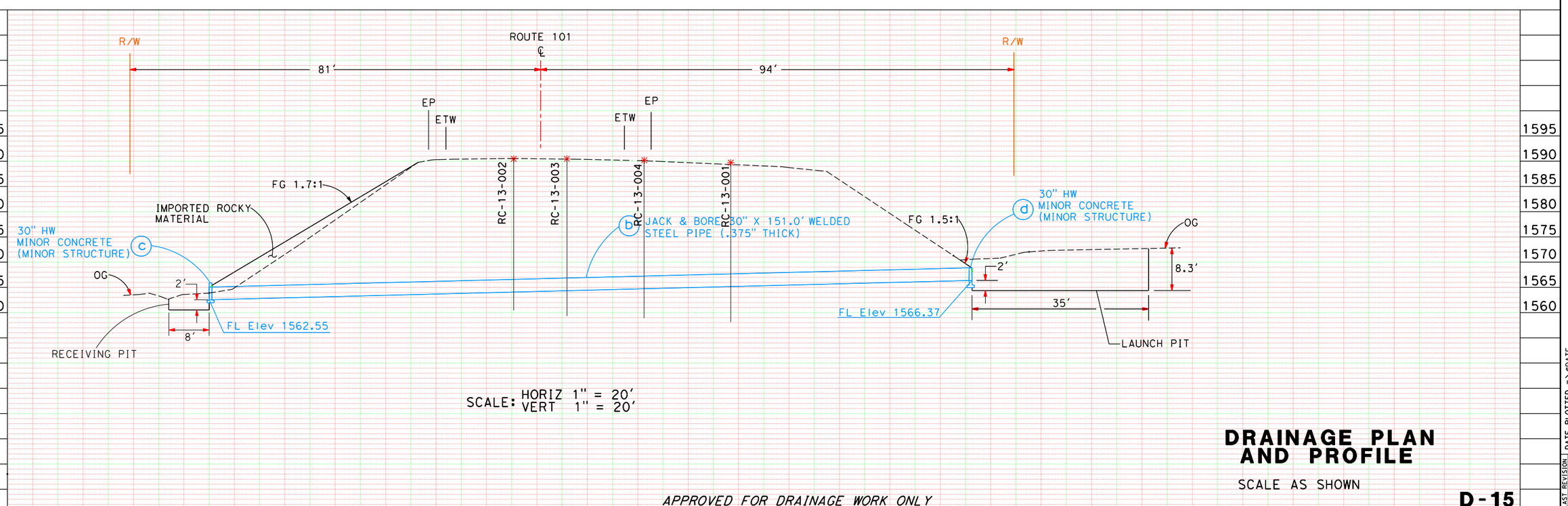
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



DRAINAGE SYSTEM No. 15

ROUTE 101
PM 76.62
SCALE: 1" = 20'

Figure 2. -- Plan map and cross section showing boring locations.



SCALE: HORIZ 1" = 20'
VERT 1" = 20'

DRAINAGE PLAN AND PROFILE

SCALE AS SHOWN

APPROVED FOR DRAINAGE WORK ONLY

D-15

REVISED BY	DATE REVISED
KIDIANGA TSHIUNZA	KIDIANGA TSHIUNZA
CALCULATED-DESIGNED BY	CHECKED BY
FUNCTIONAL SUPERVISOR	MASTRI ALVANDI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DIVISION OF ENGINEERING

LAST REVISION 00-00-00 DATE PLOTTED => $DATE TIME PLOTTED => $TIME

APPENDIX

Boring Records

RC-13-001 through RC-13-004

ROTARY FIELD NOTES

TL-1271a (REV. 01/31/00)

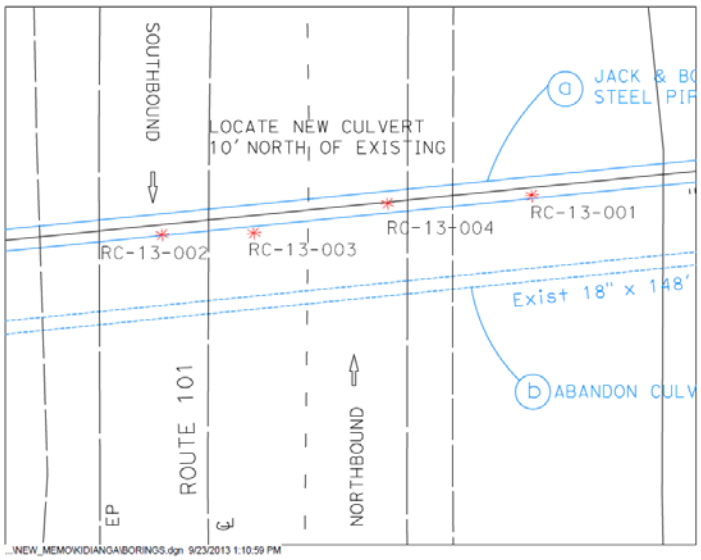
BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)	BRIDGE #
RC-13-001	8/13/2013	01	MEN	101	76.62	

LOCATION (STA/OFFSET or NORTHING/EASTING)	BRIDGE OR PROJECT NAME	EA NUMBER
10+97.30/37.71 Right of CL	Culvert Rehab	01-40280

TOP HOLE ELEVATION	CREW	EQUIPMENT	CHC NUMBER
1,589.7	Kelly Black, Gary Baker, Andrew Huff	CS-2000 Truck	#6831

HAMMER ID#
AUTOMATIC, ERi = 85%

SITE LOCATION MAP (Inc. North Arrow & Benchmark Datum)



LOGGER	
D. McGuire	
GW	DATE
GWS	DATE
CASING SIZE	CASING DEPTH
CASING SIZE	CASING DEPTH
SLURRY TYPE	Water
SURFACE CONDITIONS (Slope, Water, Vegetation, etc)	

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification *(group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics)* Rock Classification *(rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)*
Diamond Core					1		0-4.5": ASPHALT
					2		4.5"-4.3: AGGREGATE BASE
					3		4.3-5: GRAYWACKE COBBLE; 8"; hard.
					4		
		5			5		5-6.5: CLAYEY GRAVEL (GC); medium dense; grayish brown; moist; mostly coarse to fine GRAVEL; some fines; little fine SAND; moderate cementation. [FILL]
		5			6		
		4	9		7		
					8		6.5-16.5: GRAVELLY lean CLAY (CL); medium stiff and stiff; grayish brown; moist; mostly fines; little fine GRAVEL; few fine SAND; PP=0.5 tsf and 1.0 tsf. [FILL]
					9		
		4			10		
		3			11		
		3	6		12		
					13		
					14		
Very Soft at 15'; hammer dropped		1			15		
6"; void?		1			16		
		2	3		17		

ROTARY FIELD NOTES

TL-1271b (REV. 01/31/00)

BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)
RC-13-001	8/13/2013	01	MEN	101	76.62

LOCATION (STA/OFFSET or NORTHING/EASTING)	TOP HOLE ELEVATION	BRIDGE #	EA NUMBER
10+97.30/37.71 Right of CL	1,589.7	Culvert Rehab	01-40280

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification *(group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics)* Rock Classification *(rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)*
					18		16.5-23: GRAVELLY lean CLAY with SAND (CL); medium stiff; gray with yellowish brown mottling; moist; mostly fines; little coarse to fine GRAVEL; few to little fine SAND; PP=0.75. [FILL]
					19		
		2			20		
		4			21		
		3	7		22		
					23		23 -27: SEDIMENTARY ROCK (GRAYWACKE and SHALE); gray with yellowish brown mottling; intensely weathered to decomposed; (GRAVELLY lean CLAY with SAND (CL); medium stiff; moist; mostly fines; few to little coarse GRAVEL; few to little fine SAND; high dry strength); PP=0.75 tsf and 1 tsf. [MELANGE]
					24		
		4			25		
		9			26		
		10	19		27		
					28		
					29		
		10			30		27-29: SEDIMENTARY ROCK (GRAYWACKE and SHALE); gray to dark brown; intensely weathered to decomposed; (CLAYEY SAND with GRAVEL (SC); medium dense; moist; some coarse to fine SAND; some fines; little coarse to fine GRAVEL; moderate cementation). [MELANGE]
		8			31		
		11	19		32		
					33		29-31.5: SEDIMENTARY ROCK (GRAYWACKE and SHALE); gray and olive; intensely weathered to decomposed; (Poorly graded GRAVELwith CLAY and SAND (GP-GC); medium dense; moist; mostly coarse to fine GRAVEL; little coarse to fine SAND; few fines; moderate cementation). [MELANGE]
					34		
					35		
					36		
					37		
					38		
					39		
					40		
					41		
					42		
					43		
					44		
					45		
					46		TERMINATED AT ELEV 1,558.2
					47		
					48		
					49		
					50		

ROTARY FIELD NOTES

TL-1271a (REV. 01/31/00)

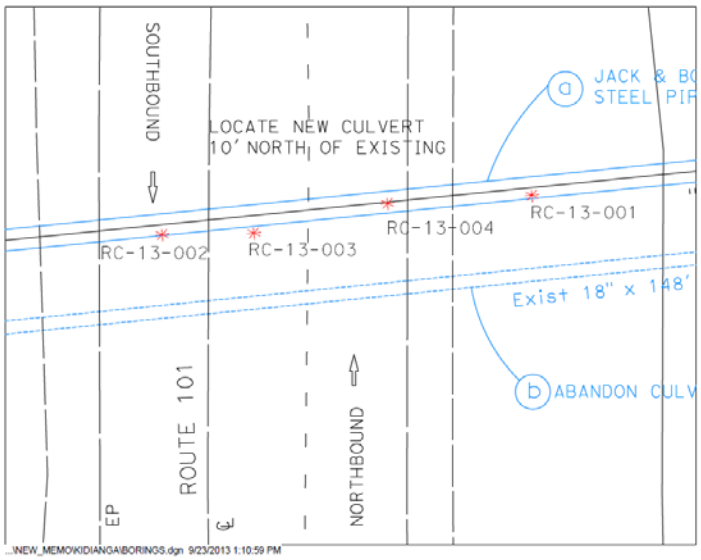
BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)	BRIDGE #
RC-13-002	8/14/2013	01	MEN	101	76.62	

LOCATION (STA/OFFSET or NORTHING/EASTING)	BRIDGE OR PROJECT NAME	EA NUMBER
10+54.56/5.34 Left of CL	Culvert Rehab	01-40280

TOP HOLE ELEVATION	CREW	EQUIPMENT	CHC NUMBER
1,590.4	Kelly Black, Gary Baker, Andrew Huff	CS-2000 Truck	#6831

HAMMER ID#
AUTOMATIC, ERi = 85%

SITE LOCATION MAP (Inc. North Arrow & Benchmark Datum)



LOGGER	
D. McGuire	
	DATE
	DATE
	CASING DEPTH
	CASING DEPTH
	Water

SURFACE CONDITIONS (Slope, Water, Vegetation, etc)

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification (group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics) Rock Classification (rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)
Diamond Core					1		
					2		0-5: ASPHALT AND AGGREGATE BASE
					3		
					4		5-6.5: CLAYEY GRAVEL with SAND (GC); very loose; grayish brown; moist; mostly fine to coarse GRAVEL; some fines; little fine SAND; moderate cementation. [FILL]
		1			5		
		1			6		
		2	3		7		
					8		6.5-15: GRAVELLY lean CLAY with SAND (CL); stiff; dark gray to gray; moist; mostly fines; some coarse to fine GRAVEL; little coarse to fine SAND; GRAYWACKE COBBLES; 6" moderately hard; PP=1 tsf and 1.5 tsf). [FILL]
					9		
		2			10		
		3			11		
		4	7		12		
					13		
					14		
		2			15		15-24: medium stiff; brownish yellow; PP=0.75 tsf. [FILL]
		2			16		
		2	4		17		

ROTARY FIELD NOTES

TL-1271b (REV. 01/31/00)

BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)
RC-13-002	8/14/2013	01	MEN	101	76.62

LOCATION (STA/OFFSET or NORTHING/EASTING)	TOP HOLE ELEVATION	BRIDGE #	EA NUMBER
10+54.56/5.34 Left of CL	1,590.4	Culvert Rehab	01-40280

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification (group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics) Rock Classification (rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)
					18		24 -28: SEDIMENTARY ROCK (SHALE); brownish yellow; intensely weathered to decomposed; (GRAVELLY lean CLAY with SAND (CL); stiff; moist; mostly fines; little to some coarse to fine gravel; little fine sand; high dry strength; PP=1.25 tsf). [MELANGE]
					19		
		3			20		
		2			21		
		3	5		22		
					23		
					24		
		2			25		
		2			26		
		4	6		27		
28': Driller Comment: Rock					28		28-30.83: SEDIMENTARY ROCK (GRAYWACKE); fine grained; massive; dark olive gray to light olive; moderately to intensely weathered; moderately soft; moderately fractured. [MELANGE]
					29		
		38			30		
		62	4"		31		
					32		TERMINATED AT ELEV 1,558
					33		
					34		
					35		
					36		
					37		
					38		
					39		
					40		
					41		
					42		
					43		
					44		
					45		
					46		
					47		
					48		
					49		
					50		

ROTARY FIELD NOTES

TL-1271a (REV. 01/31/00)

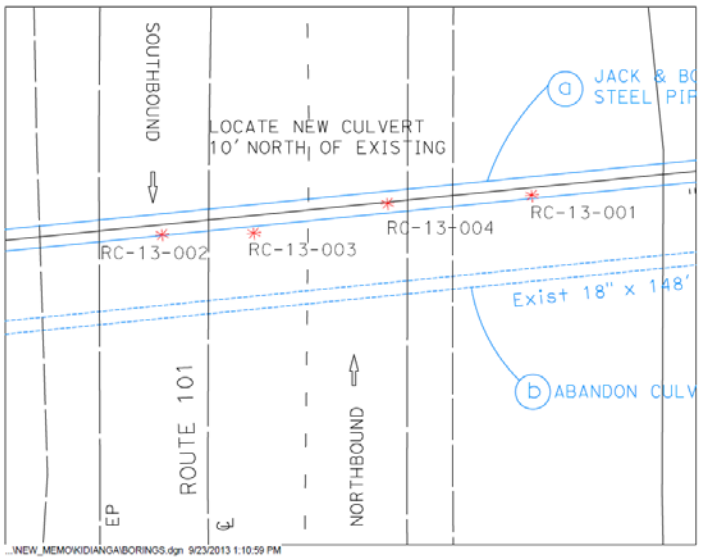
BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)	BRIDGE #
RC-13-003	8/14/2013	01	MEN	101	76.62	

LOCATION (STA/OFFSET or NORTHING/EASTING)	BRIDGE OR PROJECT NAME	EA NUMBER
10+65.07/5.20 Right of CL	Culvert Rehab	01-40280

TOP HOLE ELEVATION	CREW	EQUIPMENT	CHC NUMBER
1,590.5	Kelly Black, Gary Baker, Andrew Huff	CS-2000 Truck	#6831

HAMMER ID#
AUTOMATIC, ERi = 85%

SITE LOCATION MAP (Inc. North Arrow & Benchmark Datum)



LOGGER	
D. McGuire	
GW	DATE
GWS	DATE
CASING SIZE	CASING DEPTH
CASING SIZE	CASING DEPTH
SLURRY TYPE Water	
SURFACE CONDITIONS (Slope, Water, Vegetation, etc)	

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification *(group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics)* Rock Classification *(rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)*
Punch Core					1		0-2: ASPHALT
					2		2-5: AGGREGATE BASE
Between 5' and 10', 1" recovered					3		
					4		
		2			5		5-10: Lean CLAY (CL); very soft; dark gray to gray; moist; mostly fines; few coarse to fine GRAVEL; few fine SAND; PP=<0.25 tsf. [FILL]
		1			6		
		2	3		7		
					8		
					9		
		2			10		10-14: SANDY lean CLAY with GRAVEL (CL); very soft and stiff; bluish gray with brownish yellow mottling; moist to wet; mostly fines; little coarse to fine GRAVEL; little coarse to fine SAND; high dry strength; PP=<0.25 and 1.5 tsf. [FILL]
		5			11		
		4	9		12		
					13		
					14		
		3			15		
		3			16		
		5	8		17		

ROTARY FIELD NOTES

TL-1271b (REV. 01/31/00)

BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)
RC-13-003	8/14/2013	01	MEN	101	76.62

LOCATION (STA/OFFSET or NORTHING/EASTING)	TOP HOLE ELEVATION	BRIDGE #	EA NUMBER
10+65.07/5.20 Right of CL	1,590.5	Culvert Rehab	01-40280

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification (group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics) Rock Classification (rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)
					18		14-23.5: GRAVELLY lean CLAY with SAND (CL); varies from very soft to stiff; moist; brownish yellow with strong brown and brownish red mottling; wet; mostly fines; little coarse to fine GRAVEL; little coarse to fine SAND; high dry strength (15'-16.5'); PP=<0.25 tsf, 0.5, and 1.0 tsf. [FILL]
					19		
		4			20		
		3			21		
		4	7		22		
					23		
					24		
		3			25		23.5 -31.5: SEDIMENTARY ROCK (SHALE and GRAYWACKE); brownish yellow with strong brown and brownish red mottling; intensely weathered to decomposed; (GRAVELLY lean CLAY with SAND (CL); varies from very soft to medium stiff; moist; mostly fines; little to some gravel; little sand; varies from high to low dry strength; PP=<0.25 tsf, 0.5 tsf, 0.75 tsf). [MELANGE]
		3			26		
27: Driller Comment: Rock		7	10		27		
					28		
					29		
		42			30		
		33			31		
		57	90		32		TERMINATED AT ELEV 1,558.2
					33		
					34		
					35		
					36		
					37		
					38		
					39		
					40		
					41		
					42		
					43		
					44		
					45		
					46		
					47		
					48		
					49		
					50		

ROTARY FIELD NOTES

TL-1271a (REV. 01/31/00)

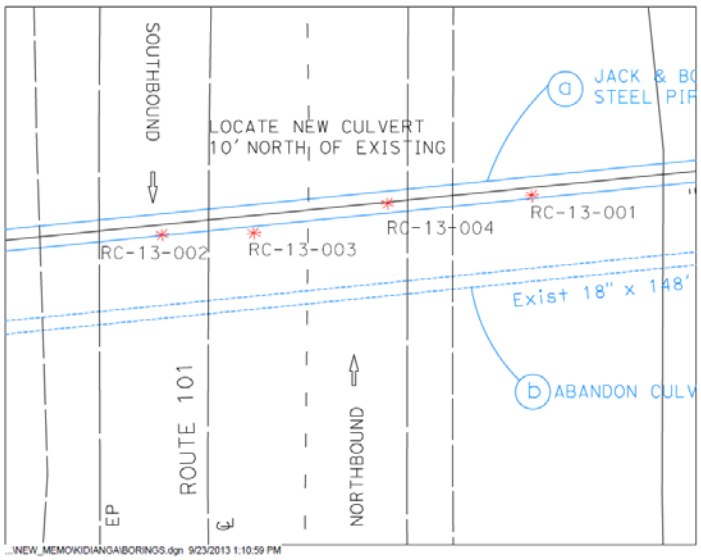
BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)	BRIDGE #
RC-13-004	8/14/2013	01	MEN	101	76.62	

LOCATION (STA/OFFSET or NORTHING/EASTING)	BRIDGE OR PROJECT NAME	EA NUMBER
10+80.70/20.55 Right of CL	Culvert Rehab	01-40280

TOP HOLE ELEVATION	CREW	EQUIPMENT	CHC NUMBER
1,590.2	Kelly Black, Gary Baker, Andrew Huff	CS-2000 Truck	#6831

HAMMER ID#
AUTOMATIC, ERi = 85%

SITE LOCATION MAP (Inc. North Arrow & Benchmark Datum)



LOGGER	
D. McGuire	
GW	DATE
GWS	DATE
CASING SIZE	CASING DEPTH
CASING SIZE	CASING DEPTH
SLURRY TYPE Water	

SURFACE CONDITIONS (Slope, Water, Vegetation, etc)

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification *(group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics)* Rock Classification *(rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)*
Punch Core					1		0-3: ASPHALT
					2		
					3		3-5: AGGREGATE BASE
					4		
		3			5		
		3			6		
		3	6		7		
					8		5-24: GRAVELLY lean CLAY (CL); stiff; gray, dark gray and dark grayish brown, with brownish yellow mottling; moist; mostly fines; little to some coarse to fine GRAVEL; little to some coarse to fine SAND; PP=1 tsf and 2 tsf. [FILL]
					9		
		3			10		
		2			11		
		4	6		12		
					13		
					14		
		3			15		
		4			16		
		4	8		17		

ROTARY FIELD NOTES

TL-1271b (REV. 01/31/00)

BORING NUMBER	DATE	DIST.	CO.	RTE.	P.M. (K.P.)
RC-13-004	8/14/2013	01	MEN	101	76.62

LOCATION (STA/OFFSET or NORTHING/EASTING)	TOP HOLE ELEVATION	BRIDGE #	EA NUMBER
10+80.70/20.55 Right of CL	1,590.2	Culvert Rehab	01-40280

REMARKS (Tool Sizes/Type - Rods & Bits, etc) (Hole Condition – Caving, Squeezing, Loss of Circulation, etc. Drill Rig reactions – slowing, chattering, skipping, blocking off)	FIELD TESTING: SAMPLE #	BLOWS PER 6"	SPT (N)	Recovery %	DEPTH (FT)	GRAPHIC LOG	DESCRIPTION Soil Classification (group name, group symbol, consistency/relative density, color, moisture, particle size, gradation, plasticity, structure, cementation, organics, fill, q_u, s_u, Other characteristics) Rock Classification (rock name, color, degree of weathering, relative hardness, bedding, discontinuity characteristics, voids, slaking, odor, other characteristics)
					18		24-29.5: SEDIMENTARY ROCK (GRAYWACKE AND SHALE); gray with brownish yellow mottling; intensely weathered to decomposed; (CLAYEY GRAVEL with SAND (GC); medium dense; moist; mostly coarse to fine GRAVEL; some fines; trace to few fine SAND; grading from moderate cementation; high and very high dry strenth. [MELANGE]
					19		
		3			20		
		4			21		
		4	8		22		
					23		
					24		
		3			25		
		3			26		
		7	10		27		29.5-31.5: SEDIMENTARY ROCK (GRAYWACKE and SHALE) chaotically interbedded; GRAYWACKE; fine grained; grayish brown; moderately weathered; soft; very intensely fractured; SHALE; brown; moderately weathered; soft; very intensely fractured. [MELANGE]
28.5: Driller Comment: Rock					28		
				33	29		
		42			30		
		33			31		
		57	90		32		
					33		TERMINATED AT ELEV 1,558.2
					34		
					35		
					36		
					37		
					38		
					39		
					40		
					41		
					42		
					43		
					44		
					45		
					46		
					47		
					48		
					49		
					50		