

LAST CHANCE GRADE PHASE 2B GEOTECHNICAL INVESTIGATION

**DEL NORTE COUNTY, CALIFORNIA
DISTRICT 1 – DN – 101 (Post Miles 12.0 to 15.5)
01-0F280/0115000099**

INITIAL STUDY
**with Negative Declaration
and Final Section 4(f) *de minimis* Determinations**



**Prepared by the
State of California Department of Transportation**



March 2020



General Information about this Document

What's in this document?

The California Department of Transportation (Caltrans) has prepared this Initial Study with Negative Declaration (IS/ND) and Final Section 4(f) *de minimis* determinations which examines the potential environmental effects of a proposed project on United States Highway 101 (U.S. 101) in Del Norte County, California. Caltrans is the lead agency under the California Environmental Quality Act (CEQA). This document tells you why the project is being proposed, how the existing environment could be affected by the project, the potential impacts of the project, and proposed avoidance, minimization, and/or mitigation measures. The draft Initial Study and Section 4(f) determination circulated to the public between December 17, 2019, and January 16, 2020. Comments received during this period are included in Appendix M.

Elsewhere throughout this document, a vertical line in the margin indicates a change made since the draft document circulation. Minor editorial changes and clarifications have not been so indicated. This document may be downloaded at the following website:

https://lastchancegrade.com/app_pages/view/50

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LAST CHANCE GRADE

PHASE 2B GEOTECHNICAL INVESTIGATION

Geotech Drilling in support of the Last Chance Grade Permanent Restoration Project,
located on U.S. Highway 101 in Del Norte County,
from post miles 12.0 to 15.5, south of Crescent City, CA


INITIAL STUDY

with Negative Declaration and Final Section 4(f) *de minimis* Determinations

Submitted Pursuant to: Division 13, California Public Resources Code
and 49 U.S.C. §303 and 23 U.S.C. §138

THE STATE OF CALIFORNIA
Department of Transportation

03/16/20
Date of Approval


Brandon Larsen, Office Chief
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California Department of Transportation
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Negative Declaration

Pursuant to: Division 13, California Public Resources Code

SCH Number: 2019129050

Project Description

The California Department of Transportation (Caltrans) proposes to conduct a geotechnical investigation in support of the Last Chance Grade Permanent Restoration Project, located on U.S. Highway 101 between post miles 12.0 and 15.5 in Del Norte County.

Determination

Caltrans has prepared an Initial Study for the project and, following public review, has determined from this study that the proposed project would not have a significant impact on the environment for the following reasons:

- The project would have “No Impact” with regard to Agricultural and Forest Resources, Air Quality, Energy, Geology and Soils, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation/Traffic, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.
- The project would have a “Less Than Significant Impact” with regard to Aesthetics, Biological Resources, Cultural Resources, Greenhouse Gas Emissions, and Hydrology and Water Quality.



Brandon Larsen, Office Chief
North Region Environmental-District 1
California Department of Transportation

03/16/20

Date



Table of Contents

	Page
Proposed Negative Declaration	1
Table of Contents	i
List of Appendices	iii
List of Tables and Figures	iv
List of Abbreviated Terms	v
Chapter 1. Proposed Project	1
1.1. Project History	1
1.2. Project Description	3
1.3. Permits and Approvals Needed.....	15
1.4. Standard Measures and Best Management Practices	16
1.5. Discussion of the NEPA Categorical Exclusion.....	22
Chapter 2. CEQA Environmental Checklist	23
2.1. Environmental Factors Potentially Affected.....	23
2.2. Project Impact Analysis Under CEQA for Initial Study	24
2.3. Aesthetics	27
2.4. Agriculture and Forest Resources	31
2.5. Air Quality	33
2.6. Biological Resources	34
2.7. Cultural Resources	76
2.8. Energy	80
2.9. Geology and Soils	81
2.10. Greenhouse Gas Emissions.....	83
2.11. Hazards and Hazardous Materials	101
2.12. Hydrology and Water Quality	103
2.13. Land Use and Planning	111
2.14. Mineral Resources.....	112
2.15. Noise.....	113

2.16.	Population and Housing	114
2.17.	Public Services	115
2.18.	Recreation	116
2.19.	Transportation/Traffic	117
2.20.	Tribal Cultural Resources	119
2.21.	Utilities and Service Systems	121
2.22.	Wildfire.....	123
2.23.	Mandatory Findings of Significance	125
2.24.	Cumulative Impacts	127
Chapter 3.	Coordination and Comments	129
Chapter 4.	List of Preparers.....	137
Chapter 5.	Distribution List.....	139
Chapter 6.	References.....	143

List of Appendices

- APPENDIX A. Phase 2B Layouts**
- APPENDIX B. NMFS, USFWS, CNDDDB, CNPS, CRPR Species Lists**
- APPENDIX C. Title VI Policy Statement**
- APPENDIX D. Section 4(f)**
- APPENDIX E. SHPO Concurrence Letter**
- APPENDIX F. Biological Surveys – Species, Personnel, and Dates**
- APPENDIX G. Special-Status Plant Species with the Potential to Occur in the Project Vicinity**
- APPENDIX H. Special-Status Wildlife Species with the Potential to Occur in the Project Vicinity**
- APPENDIX I. Wetland, Waters, and Vegetation Mapping**
- APPENDIX J. Botanical Surveys within the ESL**
- APPENDIX K. Invasive Plant Species Identified in the ESL**
- APPENDIX L. Sensitive Natural Community Impacts**
- APPENDIX M. Response to Comments**
- APPENDIX N. USFWS Letter of Concurrence**

List of Tables and Figures

Table 1.	Agency Approvals	15
Figure 1.	Project Location	7
Figure 2.	Project Vicinity	8
Figure 3.	Biological Study Area.....	41
Figures 4-6.	Vegetation Types Within the ESL	47-49
Figure 7.	U.S. 2016 Greenhouse Gas Emissions	88
Figure 8.	California 2017 Greenhouse Gas Emissions	89
Figure 9.	Change in California GDP, Population, and GHG Emissions Since 2000.....	90
Figure 10.	California Climate Strategy	94

List of Abbreviated Terms

Abbreviation	Description
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
ARB	Air Resources Board
ARPA	Archaeological Resources Protection Act
BMPs	Best Management Practices
BSA	Biological Study Area
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation (aka the Department)
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEHC	California Essential Habitat Connectivity
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CH ₄	Methane
CIA	Cumulative Impact Analysis
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CSP	California State Parks
CTC	California Transportation Commission
CTP	California Transportation Plan
CWA	Clean Water Act
dB	decibel
Department	Department of Transportation (Caltrans)
dbh	diameter at breast height

Abbreviation	Description
DNCRSP	Del Norte Coast Redwoods State Park
DPS	Distinct Population Segment
DSA	Disturbed Soil Area
EBRA	Expert Based Risk Assessment
ECA	Essential Connectivity Area
EFS	Engineered Feasibility Study
EIR	Environmental Impact Report
EO	Executive Order
EPA	Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
ESL	Environmental Study Limit
F	Fahrenheit
FE	Federally Endangered
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FPT	Federally Proposed Threatened
FT	Federally Threatened
FYLF	Foothill yellow-legged frog
G	Globally
GDRC	Green Diamond Resource Company
GHG	Greenhouse Gas
GWP	global warming potential
H&SC	Health and Safety Code
H ₂ S	Hydrogen Sulfide
HFCs	Hydrofluorocarbons
HPSR	Historic Property Survey Report
IPCC	Intergovernmental Panel on Climate Change
IS	Initial Study
ITS	Intelligent Transportation System
LCFS	low carbon fuel standard
LCG	Last Chance Grade
LEDPA	least environmentally damaging practicable alternative
LOP	Limited Operating Period
LSAA	Lake or Streambed Alteration Agreement
MAMU	Marbled Murrelet
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MMTCO _{2e}	Million Metric Tons of Carbon Dioxide Equivalent
MND	Mitigated Negative Declaration
MPO	Metropolitan Planning Organization

Abbreviation	Description
MS4s	Municipal Separate Storm Sewer Systems
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Repatriation Act of 1990
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NNI	net new impervious surface
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
Non-RPW	Non-Relatively Permanent Waters
NPDES	National Pollutant Discharge Elimination System
NPS	National Parks Service
NRHP	National Register of Historic Places
NRLF	Northern Red-legged Frog
NSO	Northern Spotted Owl
O ₃	ozone
OHV	off-highway vehicles
OHWM	Ordinary High Water Mark
PCE	primary constituent elements
PDT	Project Development Team
PM	post mile
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
PRC	Public Resources Code
PSR	Project Study Report
RNP	Redwood National Park
ROW	right of way
RPW	Relatively Permanent Waters
RSP	rock slope protection
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
S	State
SCE	State Candidate Endangered
SCS	Sustainable Communities Strategy
SCT	State Candidate Threatened
SE	State Endangered

Abbreviation	Description
SF6	sulfur hexafluoride
SFP	State Fully Protected
SHPO	State Historic Preservation Officer
SHS	State Highway System
SL	seismic line
SLR	Sea Level Rise
SNC	Sensitive Natural Community
SPSR	Supplemental Project Study Report
SPT	Standard Penetration Test
SSC	State Species of Special Concern
ST	State Threatened
SWMP	Storm Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TMDLs	Total Maximum Daily Loads
TMP	Traffic Management Plan
UNESCO	United Nations Educational, Scientific and Cultural Organization
U.S. or US	United States
U.S. 101	United States Highway 101
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USEPA or U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
VA	Value Analysis
VegCamp	Vegetation Classification and Mapping Program
VIA	Visual Impact Assessment
VMT	Vehicle Miles Traveled
WDRs	Waste Discharge Requirements

Chapter 1. Proposed Project

1.1. Project History

United States Highway 101 (U.S. 101) between post miles (PM) 12.0 and 15.5 in Del Norte County (known as “Last Chance Grade”) has been progressively sliding towards the Pacific Ocean due to storm events since the roadway was first constructed. The roadway is now at the edge of bluffs that are subject to active coastal erosion.

A major storm event in March 2012 resulted in increased landslide activity, severe highway damage, and the need for emergency repairs. As part of the repairs, Caltrans installed a surface monitoring network and multiple slope indicators. The collected data reveals the landslide complex is as deep as 260 feet, with multiple shallower landslides located throughout the project limits.

Over \$35 million was approved by the Federal Emergency Relief program to repair storm damage from years 2016 and 2017. Repairs included several new retaining walls, repairs to damaged walls, in addition to raising the grade 16 feet at one location. Due to continual road movement, ongoing construction and maintenance activities are necessary to keep U.S. 101 open to the traveling public.

Since the March 2012 storm event, there has been an increase in appeals from the public and elected officials for Caltrans to address the instability and progressive loss of the roadway. In response, Caltrans initiated an Engineered Feasibility Study (EFS). The EFS, completed in June 2015, provided seven alternatives ranging in cost from \$300 million to \$1.2 billion dollars (Year-of-Construction dollars). Caltrans also prepared an Economic Impact Study which concluded that long and short-term highway closures would have a substantial impact on the regional economy. A Project Study Report (PSR) was completed in July 2016 and a Supplemental Project Study Report (SPSR) was completed in July 2019.

In May 2017, the California Transportation Commission (CTC) approved initial funding of \$5 million for preliminary geotechnical studies. An additional \$45 million was allocated in March 2019 which fully funds the environmental compliance phase of the project. Design, right of way, and construction funds will be requested near the completion of the environmental compliance phase.

An Expert Based Risk Assessment (EBRA) was conducted in 2018. The assessment used geological and landslide studies, published reports, and experts with experience with the area to analyze the potential risks associated with long-term ownership of each project alternative including maintenance needs and costs, significant repairs and delays, and long-term closures. The general conclusion was that all alternatives are expected to have high maintenance costs, though the risks of traveler delay and closure vary. However, alternatives located outside of Redwood National and State Parks (known as the “C” alternatives which traverse the Mill Creek watershed) were determined to have the highest associated risk of long-term closure. The information presented in the ERBA was used in a 2018 Value Analysis (VA) which was conducted to determine the viability of the different alignments. Because of the ERBA and the VA, the “C” alignments were eliminated from further consideration.

The alignments for Alternatives “L” and “X” were added as part of the EBRA, and the alignments for Alternatives “G1” and “G2” were added after the VA was completed. The alignments for Alternatives “A1”, “A2”, and “F” are the same as proposed in the 2016 PSR. Please see the Phase 2B Layouts for the currently proposed alignments (Appendix A).

To determine the feasibility of the proposed alternatives and to develop a better understanding of the geology of the area, several geotechnical investigations have occurred, including Phase 1A (completed summer 2018), and Phase 1B and Phase 2A (completed fall 2019). This Initial Study focuses entirely on the effort to perform Phase 2B geotechnical investigations.

For the purposes of the project, the California Department of Transportation (Caltrans) is the lead agency under the California Environmental Quality Act (CEQA).

1.2. Project Description¹

Caltrans proposes to conduct geotechnical investigation activities (referred to as Phase 2B) east of U.S. 101 between post miles 12.0 and 15.5 in Del Norte County (see Figures 1 and 2). The Phase 2B activities would support the Last Chance Grade (LCG) Permanent Restoration Project, which proposes to develop a permanent solution to the instability and potential roadway failure at LCG. The proposed Phase 2B geotechnical investigation would include 15 boring locations (with two alternative sites, B-30B and B-34B, under consideration) and 14 seismic refraction line locations (Seismic Lines [SL]). The locations are within Redwood National Park (RNP), Del Norte Coast Redwoods State Park (DNCRSP), Green Diamond Resource Company (GDRC) land, and Caltrans' right of way (ROW). The boring and seismic line locations are identified below and on the Phase 2B Layouts (Appendix A). Except for boring location B-36, which would be a horizontal bore, all the borings would be vertical.

- 1) **RNP:** B-19, B-20, B-23, B-25, B-26, SL 9, SL 10, and SL 23. SL 23 straddles the RNP/GDRC boundary line.

¹ The project description has been updated to reflect a change in access methods to some of the project locations, and to include more accurate boundaries, resulting in the determination that several locations are within Caltrans' right of way (ROW):

- B-19, B-20, and B-25: These bore holes would be accessed via helicopter rather than the existing DeMartin Campground access road and Coastal Trail, eliminating the need for grading on the road and trail.
- B-22: This location is within Caltrans' right of way, and would be accessed via helicopter, eliminating the need for modification of an existing erosional scar.
- B-34A, B-34B, SL 11, and SL 15: B-34A and SL 15 are within Caltrans' right of way, and B-34B and SL 11 straddle the DNCRSP/ROW boundary line. No changes have been made to these locations.
- B-24: This bore hole would still be drilled on the existing road; however, the location would be to the west of the originally proposed location, to be within Caltrans' right of way. No other changes have been made to this location.

The layouts in Appendix A have been updated to reflect these changes.

- 2) **DNCRSP:** B-28, B-29, B-30 (A or B), B-34B, SL 11, SL 12, SL 13, SL 14, SL 16, SL 17, SL 18 and SL 21. Location B-36 begins above ground within GDRC land but would traverse horizontally below ground into the DNCRSP parcel. Location B-34B and SL 11 straddle the DNCRSP/ROW boundary line. SL 18 and SL 21 straddle the DNCRSP/GDRC boundary line.
- 3) **GDRC:** B-16, B-35, B-36, B-40, SL 18, SL 20, SL 21, SL 22, and SL 23. SL 18 and SL 21 straddle the DNCRSP/GDRC boundary line. SL 23 straddles the RNP/GDRC boundary line.
- 4) **ROW:** B-22, B-24, B-34 (A or B), SL 11, and SL 15. Location B-34B and SL 11 straddle the DNCRSP/ROW boundary line.

Choosing the boring and seismic line locations and access routes was an iterative process that involved multiple field reviews and project development team meetings, the identification of geotechnical data needs, and an analysis of the potential effects the investigation could have on environmental resources. The goal was to minimize effects while ensuring the collection of adequate data to be able to determine the viability of potential alternatives. To achieve this goal, each boring and seismic line location was evaluated and, if possible, moved to an alternative location with fewer potential impacts.

The site selection process involved the consideration of access routes and whether existing access roads or trails could be used. Though several borings are required where no existing access is available, in lieu of constructing access roads, the borings were situated where helicopters could safely access (e.g., natural open canopies in the forest). For seismic line locations where no current access roads or trails exist, the locations would be accessed by foot paths.

In addition, sites in RNP that required grading of the existing access road and trails were converted to helicopter drill sites to reduce impacts to the park.

Project Objective (Purpose and Need)

The purpose of the investigation is to characterize the geology within the project area and along potential roadway alignments. The characterization would occur through the analysis of soil and rock samples, groundwater data, and measurements of slope movement. The information is needed to evaluate and identify geotechnically critical sites, including locations of potential bridge abutments and tunnel portals, and to assess the long-term geotechnical risks along potential alignments.

Proposed Project

The Phase 2B geotechnical investigation would include 15 boring locations (with two alternative sites, B-30B and B-34B, under consideration) and 14 seismic refraction line survey locations. Five boring and 4 seismic refraction line locations would be within RNP, 3 or 4 boring (depending on alternative sites chosen) and 8 seismic refraction line locations would be within DNCRSP, 4 boring and 5 seismic refraction line locations would be within GDRC land, and 3 boring (with one alternative site) and 2 seismic refraction line locations would be within Caltrans' ROW (See Appendix A, Phase 2B Layouts).

Redwood National Park: Boring Locations and Seismic Line Access

Boring location B-23 would be accessed and drilled on an existing road east of U.S. 101. No vegetation removal or grading is proposed at this site.

Equipment would be delivered to boring locations B-19, B-20, and B-25 by helicopter. The drilling team would access the locations by foot along the existing National Park Service (NPS) access road and the DeMartin section of the Coastal Trail. For equipment purposes, trimming of vegetation (with hand tools) to 6 inches above the ground would be required.

Site B-26 would be accessed from an existing NPS road and may need up to 50- by 50-feet of vegetation trimming. A rubber track rig² (less than 6 feet wide) would be used to minimize

² Rubber track vehicles cause less ground disturbance (soil compaction) than steel track vehicles, particularly in areas of grass and wet or soft soil. Additionally, rubber tracks are quieter and create less vibration than steel tracks. In comparison with rubber tires, rubber tracks distribute machinery weight more evenly and create more traction, which would reduce rutting.

disturbance within the park. A large existing clearing adjacent to the access road would be used for staging.

It is anticipated this section of the Coastal Trail and the DeMartin Campground would need to be closed for approximately 6-8 weeks to complete the drilling and site restoration.

All borings within the park would be vertical borings.

Seismic lines SL 9, SL 10, and SL 23 would be accessed by foot; light vegetation trimming may be required to create a pathway to the locations. SL 23 straddles the RNP/GDRC boundary line.



Figure 1. Project location

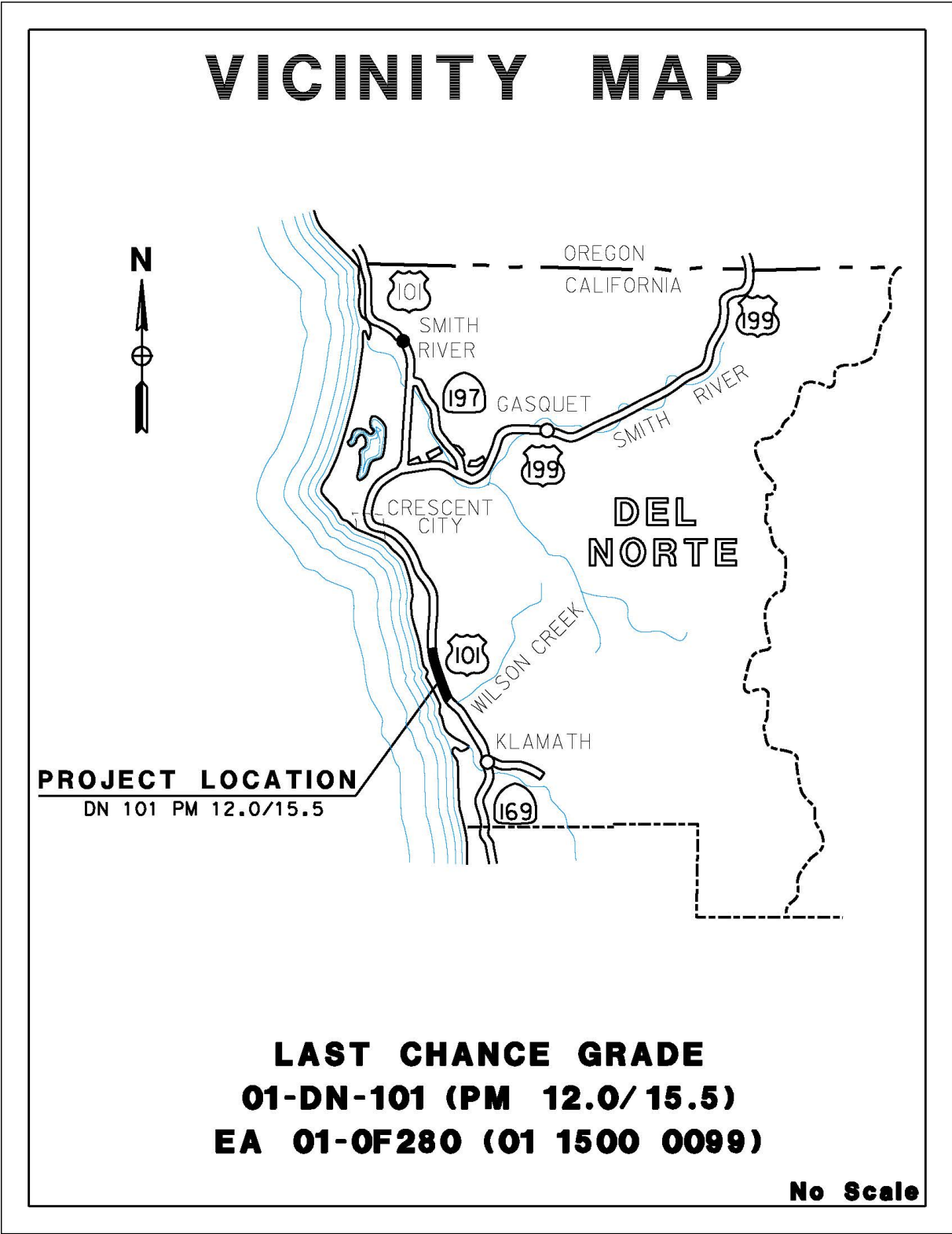


Figure 2. Project Vicinity

Del Norte Coast Redwoods State Park: Boring Locations and Seismic Line Access

Due to thick vegetation, topography, and other access limitations, equipment would be delivered to boring locations B-28, B-29, and B-30A by helicopter. These locations were chosen based on the amount of naturally open canopy. Locations B-30B and B-34B are alternative sites for locations B-30A and B-34A (in Caltrans' ROW) and, if needed, would also be accessed by helicopter. The alternative sites are near the proposed B-30A and B-34A drilling sites and would only be used if they were determined to be safer and easier to access. This determination would be made by the helicopter pilot once geotechnical staging activities begin. Once the equipment is delivered, the drilling team would access the locations by foot from U.S. 101. For equipment access purposes, trimming of vegetation (with hand tools) to 6 inches above the ground would be required.

All borings originating within the park would be vertical borings. Boring location B-36 begins above ground within GDRC land but would traverse horizontally below ground into the DNCRSP parcel. Boring location B-34B straddles the DNCRSP/ROW boundary line.

Seismic lines SL 11, SL 12, SL 13, SL 14, SL 16, SL 17, SL 18 and SL 21 would be accessed by foot, and light vegetation trimming (with hand tools) may be required to create a pathway to both the boring and survey line locations. SL 18 and SL 21 straddle the DNCRSP/GDRC boundary line. SL 11 straddles the DNCRSP/ROW boundary line.

No road access, road development, or road creation would occur within California State Parks (CSP) land (see Phase 2B Layouts in Appendix A).

Green Diamond Land: Boring Locations and Seismic Line Access

Boring locations B-16, B-36, and B-40 would be accessed by existing GDRC logging roads and may need up to 50- by 50-feet of vegetation trimming and clearing. Brushing, small tree removal and light grading on two sections of an existing GDRC road would be needed (see Phase 2B Layouts in Appendix A). Location B-35 would be accessed by helicopter. Boring B-36 is a horizontal bore that originates in GDRC land and once below ground extends into DNCRSP land.

Seismic lines SL 18, SL 20, SL 21, and SL 22 would be accessed by foot from existing GDRC roads. Seismic line location SL 23 would be accessed from the DeMartin Campground. SL 18 and SL 21 straddle the DNCRSP/GDRC boundary line. SL 23 straddles the RNP/GDRC boundary line.

Caltrans Right of Way: Boring Locations and Seismic Line Access

Boring location B-24 would be accessed and drilled on an existing road east of U.S. 101. No vegetation removal or grading is proposed at this site.

Equipment would be delivered to boring locations B-22 and B-34 (A or B) by helicopter. As discussed in the DNCRSP section above, B-34B, which straddles the DNCRSP/ROW boundary line, would only be used if determined to be safer and easier to access than B-34A. The determination would be made by the helicopter pilot once geotechnical activities begin. Once the equipment is delivered, the drilling team would access the locations by foot from U.S. 101. For equipment access purposes, trimming of vegetation (with hand tools) to 6 inches above the ground would be required.

An existing erosional scar between B-22 and U.S. 101 was originally proposed to be filled and graded, and a rock dissipation structure installed post operation. However, due to the change in access at this location, work on the erosional scar is no longer required.

Seismic lines SL 11 and SL 15 would be accessed by foot, and light vegetation trimming (with hand tools) may be required to create a pathway to the survey line locations. SL 11 straddles the DNCRSP/ROW boundary line.

Helicopter Access

Due to thick vegetation, topography, and other access limitations, equipment would be delivered to nine bore locations by helicopter, as described above. All helicopter drilling sites are in areas with an existing natural gap in the canopy. There are three potential helicopter staging areas located along GDRC logging roads that have larger clearings (Appendix A).

An AS350 Airbus Helicopter, with a 1,400-pound load capacity and low noise and downdraft, would likely be used to transfer equipment to drilling sites. Equipment would be lowered from the helicopter using a 100- to 200-foot cable. A pre-fabricated, modular steel drill platform, approximately 20- by 20-feet, would be placed at each site for the duration of the drilling. The drilling platform requires an area of up to 50- by 50-feet cleared of vegetation to 6 inches above the ground, and is supported by up to eight legs, each requiring approximately 2- by 2-feet of ground clearing to ensure flat contact with the ground.

It would take approximately 12 trips to get the drill deck and other equipment into place at each location. The longest flight path is 1.3 miles, between the easternmost helicopter

staging area and the southernmost boring location (B-25). Based on the anticipated flight speed, each one-way flight would take approximately 7 to 8 minutes (~90 minutes/12 trips). Assuming a few miles round trip and no complications, this would take approximately 90 minutes for each location. Additional flights to resupply drill sites would also be required.

As drilling at each location is anticipated to take one week, flights associated with the mobilization and demobilization of each site would be about one week apart. Depending on equipment and staff availability, two drill crews may work simultaneously; however, both crews would be serviced by the same helicopter.

Due to weather conditions and anticipated environmental work windows, helicopter operations would occur between September and January, ideally in September and October, as weather conditions allow. As needed, when helicopters are working near or are required to cross over U.S. 101, temporary road closures with traffic control may be implemented.

Drilling Equipment

The following equipment would be required for the investigation: a platform, track- or truck-mounted drill rig equipped with a Standard Penetration Test (SPT) hammer, water truck, crew cab, and a geologist/engineer's vehicle. Portable ground protection mats may be used to aid vehicular access and protect soft ground surfaces. As a best management practice (BMP), plastic sheeting and straw wattle would be used to contain any drilling fluid.

The SPT is an in situ dynamic penetration test designed to provide geotechnical engineering properties of the soil. The SPT hammer uses a thick-walled, split-spoon sample tube approximately 25.6 inches long with an outside diameter of 2 inches and inside diameter of 1.4 inches. This tube would be driven into the ground by a 140-pound slide hammer freefalling 30 inches. The tube would be driven 18 inches into the ground, or until hammer refusal.

Drilling Procedure

To obtain quality soil and rock samples at the depths needed, a mud rotary drilling system would be required for the borings. Borings would be 4.75 inches in diameter and would extend approximately 200 feet below ground surface. The system requires drilling fluid to keep the bore hole open, bring cuttings to the surface, and to lubricate and cool the drill bit. Drilling fluid is made up of water or water mixed with a thickening agent such as bentonite clay and/or a liquid polymer. The drilling fluid is fully contained and recirculated through a closed system using an 8-inch outer steel casing, 3.7 inches (94-millimeter) drill rod, and

mud tank. The mud tank would be positioned on the ground surface adjacent to the drill rig and would serve as a settling tank for soil cuttings. The cuttings would be removed periodically and placed in 55-gallon steel drums, which would be transferred to a fenced staging area.

Standpipe monitoring wells or slope indicators may be installed in the bore holes; these would be monitored periodically for up to 2 years before being destroyed in accordance with Del Norte County Environmental Health Division's requirements. Holes receiving a monitoring well would be flushed with clean water before a slotted PVC standpipe is installed and the annular space filled with clean #8 sand. The hole would be sealed with bentonite plugs to prevent infiltration of surface water or migration of water between aquifers. During drilling, the drill crew and geologist/engineer onsite would monitor for any leaks or spills of drilling fluid. If drilling fluid were to leak, the drill crew would immediately contain the escaping fluid and clean the impacted area.

Seismic Surveys

Seismic refraction line surveys are conducted to help characterize the subsurface conditions, estimate the depth to rock, and evaluate rip-ability of proposed excavations. The surveys would be performed on foot. Vegetation removal would consist of limited trimming of ground-level undergrowth in a strip up to 4 feet wide (enough to lay out the equipment).

The survey lines would be between 200 and 600 feet long. Surveys would take approximately two days to complete. The surveys involve placing 24 small geophones (seismic sensors) on the ground in a straight line at equal spacing. The geophones have a 1-inch long prong that is pressed into the ground (usually by foot) to hold the geophone firmly so that shock waves are transmitted efficiently from the ground to the potentiometers inside the geophone. The geophones transmit a signal to a seismograph unit by a specialized cable. Shock waves would be created by slamming a 12- to 16-pound human-powered sledgehammer against a striker plate placed on at least seven different locations along the refraction line. The striker plate consists of an 8-inch square and a 0.75-inch thick steel plate or high-density polyethylene. The noise from the hammer striking the metal plate is estimated at 108 decibels (dB) at 9.8 feet and is approximately 85 dB at 50 feet.

A small triggering device attached to the side of the hammer head registers the moment of impact with the plate and transmits a signal that is sent along a small shot wire to the seismograph unit, which begins recording. If the hammer and plate provide insufficient energy to cover the entire survey line, a shock-producing device involving a down-hole

shotgun would be used. The down-hole shotgun uses an industrial shell fired in a minimum 1.5-foot deep water-filled hole created by a hand auger. The industrial shell is an 8-gauge 350- to 500-grain blank shotgun cartridge. Shells are triggered approximately 20 minutes apart. Shotgun detonations may leave an area of disturbed earth up to 2 feet in diameter. Disturbed soil would be tamped down to return it to its original condition. Detonation of the shells occurs below ground and usually does not pose a fire hazard, but fire suppression equipment would be kept on hand when working during wildfire season. With well-prepared shot holes, the highest anticipated noise generated consists of a muffled “thump” of approximately 80 dB.

Anticipated Schedule

Phase 2B geotechnical investigations are anticipated to be completed between September 16, 2020 and January 31, 2021; however, if activities cannot be completed during this time, an additional season may be required, with activities occurring between September 16, 2021, and January 31, 2022. Because it poses minimal potential disruption to highway traffic, work would be conducted during the day. If needed, drilling time restrictions would be observed at certain locations to minimize potential disturbance to nearby resources.

Post Investigation Clean-Up Operations

After the completion of each boring, soil cuttings and drilling fluid generated by the operation would be pumped and/or shoveled into 55-gallon drums for hazardous waste characterization and disposal. Any cuttings and/or drilling fluid inadvertently spilled onto the ground would be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean surfaces to prevent contamination of future storm-water or impacts to public safety, a minimal amount would be used and as much of the dirty water captured as practical. Any areas of ground disturbance created during off-road drilling activities would be treated with appropriate BMPs to prevent erosion and stormwater pollution. Borings that do not receive a monitoring pipe would be backfilled using neat cement grout placed at the base of the bore hole by tremie in accordance with Caltrans requirements. Any holes in the road surface would be patched with fast setting cement.

No-Build Alternative

The No-Build Alternative would involve conducting no geotechnical investigation activities.

Alternatives Considered but Eliminated from Further Consideration

The proposed geotechnical investigation would provide data to help identify potentially reasonable and feasible alternatives for the greater highway project. As part of this effort, only one overall geotechnical investigation alternative has been proposed, thus no investigative alternatives have been eliminated. However, as discussed earlier in this section, bore and seismic line locations were evaluated and, where possible, moved to locations that would have fewer potential impacts. Site selection was an iterative process that included multiple factors including geotechnical data needs, access routes, and environmental resources.

General Plan Description, Zoning, and Surrounding Land Uses

The project area and surrounding lands are within Del Norte County and subject to the Del Norte County General Plan of 2003. The project spans several land use areas, including the state and federal lands of DNCRSP and RNP, the timberlands owned by GDRC, and Caltrans' ROW. While GDRC is zoned as a Timber Preserve Zone, the state and national park either have no zoning designation or are designated as RNP. The project would not change the existing land use or zoning designations in the project area.

1.3. Permits and Approvals Needed

As proposed, the project would not impact any wetlands or jurisdictional waters. The following permits, consultations, and approvals would be required.

Table 1. Agency Approvals

Agency	Permit/Approval	Status
U.S. Fish and Wildlife Service (USFWS)	Federal Endangered Species Act Section 7 Consultation	Letter of Concurrence (LOC) received on February 10, 2020. See Appendix N.
National Park Service (NPS)	Department of Transportation Act Section 4(f)	Signed Section 4(f) received on February 19, 2020.
California State Parks (CSP)	Department of Transportation Act Section 4(f)	Signed Section 4(f) received on February 18, 2020.
Del Norte County Planning	Coastal Development Permit	Obtained after the Final Environmental Document (FED) is approved.
California Coastal Commission (CCC)	Coastal Development Permit	Obtained after FED is approved.

Department of Transportation Act Section 4(f)

For projects that are federally funded, Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 prohibits the Federal Transit Administration and other USDOT agencies from using land from publicly owned parks, recreation areas (including recreational trails), wildlife and water fowl refuges, or public and private historic properties, unless there is no feasible and prudent alternative to that use and the action includes all possible planning to minimize harm to the boundary resulting from such a use. The project has federal funds and would require the temporary use of a Section 4(f) resource. See Appendix D for more information.

1.4. Standard Measures and Best Management Practices

The following project features are standard measures and Best Management Practices that are part of the project description.

Visual Aesthetics

VA-1: Any existing roads and trails, modified as part of the proposed project, would be restored to a pre-disturbance condition and revegetated with appropriate native plants. Final ground sculpting and surfacing, as well planting species and locations, would be developed by the project landscape architect and project biologist based on existing aesthetics, land use, and habitat with the consultation and approval of CSP and the NPS.

VA-2: Trees to be removed would be cut off at the base.

Cultural Resources

CR-1: Any environmentally sensitive areas in proximity to the proposed project would be identified and delineated prior to the start of work. Prior to the start of work, onsite meetings will be conducted to familiarize workers with the location and nature of resources to be protected.

CR-2: Work at specific culturally-sensitive areas would require archeological monitoring.

CR-3: If cultural materials are discovered during geotechnical activities, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find in consultation with tribal representatives, CSP, NPS, and the SHPO.

CR-4: If human remains and related items were discovered on private or State land, they would be treated in accordance with State Health and Safety Code § 7050.5. Further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) § 5097.98, if the remains were thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC) who would then notify the Most Likely Descendent (MLD).

Human remains and related items discovered on federally-owned lands would be treated in accordance with the Native American Graves Repatriation Act of 1990 (NAGPRA) (23 USC 3001). The procedures for dealing with the discovery of human remains, funerary objects, or

sacred objects on federal land are described in the regulations that implement NAGPRA 43 CFR Part 10. All work in the vicinity of the discovery would be halted and the RNP Archaeologist would be notified immediately. The Undertaking's implementation in the vicinity of the discovery may not resume until RNP complies with the 43 CFR Part 10 regulations and provides notification to proceed. The responsible Federal agency official (43 CFR 10.2(2)) will be RNP.

Biological Resources

BR-1: To protect migratory and nongame birds, their occupied nests and eggs, vegetation removal would be restricted to the period outside of the bird breeding season (removal would occur between September 16 and January 31).

BR-2: A qualified biologist would survey appropriate trees that are scoped for removal for the presence of inactive raptor nests. If raptor nests are identified, the tree(s) would be avoided or CDFW would be contacted to coordinate appropriate actions.

BR-3: For Sensitive Natural Communities and Special-Status Plants:

- Limbing, tree removal, and vegetation clearing would be limited to the extent necessary to achieve access and conduct geotechnical activities.
- Where feasible, drilling equipment and vehicles would be parked on non-vegetated surfaces.
- If soils become compacted in previously undisturbed areas, in coordination with CSP and NPS, measures would be taken to uncompact soils to encourage the regeneration of vegetation.
- All disturbed areas, including boring locations, seismic survey lines and foot paths would be documented. Coordination would occur with State and National Parks to ensure that Park lands are fully restored to a condition at least as good as prior to the project, and in accordance with Park requirements and restoration guidelines. Materials that blend in with the surrounding environment would be used for restoration measures of disturbed soil areas. This may include duff, wood mulch, etc.
- Invasive weed control in all areas of soil disturbance caused by the geotechnical investigation to improve habitat for native species in and adjacent to disturbed soil areas.

- Conduct annual qualitative monitoring for up to three years after disturbance to assess native plant recovery and the presence of invasive plant species at sites where vegetation clearing and removal or ground disturbance would likely be greatest. These locations include:
 - DNCRSP and RNP: The 50- by 50-foot brushing areas, 2- by 2-foot platform leg areas at the helicopter bore hole sites, seismic line locations, and foot paths.
- Areas that are graded would be restored to a pre-disturbance condition.
- All restoration work would be inspected and approved by CSP and NPS.
- Prior to the start of work, temporary high visibility fencing and/or flagging would be installed around sensitive natural communities and, if identified within the ESL, special-status plants, where appropriate.

BR-4: Prior to the start of work, temporary high visibility fencing and/or flagging would be installed around intermittent streams, wetlands and other waters, where appropriate. No work would occur within fenced/flagged areas and no discharge of construction debris would take place.

BR-5: For special-status amphibians, a qualified biologist would conduct an amphibian survey immediately prior to ground-disturbing work, such as grading or vegetation removal. If amphibians are discovered in areas of work activities, they would be relocated to nearby suitable habitat. If threatened or endangered species are discovered, including foothill yellow-legged frog (FYLF), work would either be stopped until the animal is out of the impact area, or CDFW would be contacted to establish steps to avoid or minimize adverse effects.

BR-6: A Limited Operating Period (LOP) would be observed, whereby all project activities would occur during the day, between September 16 and January 31, which is a time of year when the following special-status species would not be expected to have dependent young: ring-tailed cat, Sonoma tree vole, white-footed vole, Townsend's big-eared bat, Humboldt marten, fisher West Coast Distinct Population segment (DPS), northern spotted owl (NSO), and marbled murrelet (MAMU). Specific measures for species include:

- Ring-tailed cat: Prior to removal, the mature alder tree at B-34A or B-34B, or any other suitable denning habitat, would be surveyed by a qualified biologist for cavities that could provide rest or den sites. If a potential den is identified, it would be

- monitored until absence was confirmed or CDFW would be contacted to establish appropriate steps.
- Humboldt marten and fisher: Prior to removal, the mature alder tree at B-34A or B-34B, or any other suitable denning habitat, would be surveyed by a qualified biologist for cavities that could provide rest or den sites. If a potential den is identified, it would be monitored until absence was confirmed or USFWS and CDFW would be contacted to establish appropriate steps. Except where delivering equipment and landing (in designated staging areas), helicopters would operate at an altitude high enough to avoid damaging trees directly or by rotor wash.
 - Northern spotted owl and marbled murrelet: Except where delivering equipment and landing (in designated staging areas), helicopters would operate at an altitude high enough to avoid damaging trees directly or by rotor wash. No suitable NSO or MAMU nest trees would be removed. No MAMU critical habitat will be altered or removed to the extent that the physical and biological features of the habitat essential to the conservation of the species would be negatively affected.

BR-7: Before start of work, a meeting with the contractor would consist of a briefing on environmental permit conditions and requirements relative to each stage of the proposed project, including, but not limited to, work windows, proper trash disposal and food storage, drilling site management, methods for preventing the spread of invasive species, and how to identify and report regulated species within the project areas.

BR-8: A rubber track rig (less than 6 feet wide) would be used to minimize disturbance at location B-26. At the direction of NPS, gravel and/or rubber mats would be used to ensure the track rig does not negatively impact the road, coastal trail, or bore locations.

BR-9: Drilling contractors would be directed to take precautions against fire, such as keeping fire suppression equipment on hand.

Geology and Soils

GS-1: In the unlikely event that paleontological resources were encountered during grading, Caltrans Standard Specification 14-7 would be followed. This standard specification states that if unanticipated paleontological resources were discovered at the job site, all work within 60 feet would stop, the area around the fossil would be protected, and the Caltrans geotechnical investigation lead would be notified.

Invasive Species

IS-1: To improve habitat for native species in and adjacent to disturbed soil areas within and adjacent to the Parks, Caltrans would implement a program of invasive non-native plant control in all areas of soil disturbance caused by geotechnical investigation activities.

IS-2: Any hay, straw, hay bales, straw bales, seed, mulch, or other material used for erosion control or landscaping in the project area would be free of non-native weed seeds and propagules.

IS-3: All equipment (including helicopters) would be thoroughly cleaned of all dirt and vegetation prior to entering the Environmental Study Limits (ESL) in order to prevent importing invasive non-native plants.

IS-4: All equipment, materials and fill brought to the site, including drill rigs, rock, gravel, road base, sand, and topsoil, would be free of non-native weed seeds and propagules.

IS-5: Caltrans would not allow disposal of soil and plant materials from any areas that support invasive non-native species to areas that support stands dominated by native vegetation.

IS-6: Any seed mixes or other vegetative material used for revegetation of disturbed sites would consist of nonpersistent cereal grain, California native seed mix, or locally adapted native plant materials to the extent practicable.

IS-7: Plant species used for erosion control would consist of native species or nonpersistent hybrids that would prevent invasive species from colonizing.

IS-8: Workers would be educated on the importance of controlling and preventing the spread of identified invasive nonnative species, including the requirement that footwear and clothing are free of non-native weed seeds and propagules before entering CSP and NPS land.

Public Resources

PR-1: Signage would be posted at trailheads and at the DeMartin Campground, and information would be posted on websites to notify hikers and campers of the construction activities (including helicopter use).

Traffic and Transportation

TT-1: Pedestrian and bicycle access would be maintained along U.S. 101 during geotechnical activities.

TT-2: The contractor would be required to reduce any access delays to driveways or public roadways within or near the work zones.

Utilities and Emergency Services

UE-1: All emergency response agencies in the project area would be notified of the project schedule and would have access to U.S. 101 throughout the investigation period.

Water Quality and Stormwater Runoff

WQ-1: Existing vegetation would be removed to the minimum extent necessary to facilitate the proposed work.

WQ-2: Temporary access road entrances and exits would be stabilized and maintained to prevent sediment erosion and transport from the work area.

WQ-3: Temporary drainage inlet protection methods, such as gravel bags, would be deployed to prevent sediment and other pollutants from entering drainage systems.

WQ-4: Where needed, perimeter control devices, such as fiber rolls, compost socks, and silt fences, would be used to prevent sediment transport from the project site.

WQ-5: Drilling equipment, re-fueling areas, as well as equipment and storage areas would be covered and located away from drainage inlets and waterways to prevent both stormwater and non-stormwater discharges.

WQ-6: Prevent drilling slurries and fluids from entering storm drain systems and receiving waterbodies.

1.5. Discussion of the NEPA Categorical Exclusion

This document contains information regarding compliance with the CEQA and other state laws and regulations. Separate environmental documentation, supporting a Categorical Exclusion determination, has been prepared in accordance with the National Environmental Policy Act. When needed for clarity, or as required by CEQA, this document may contain references to federal laws and/or regulations (CEQA, for example, requires consideration of adverse effects on species identified as a candidate, sensitive, or special-status species by the National Marine Fisheries Service [NMFS] and the United States Fish and Wildlife Service [USFWS]—in other words, species protected by the Federal Endangered Species Act).