APPENDIX A

CEQA Checklist

CEQA Appendix G Environmental Checklist

04–SOL–80 (PM 10.4/30.2) | 04-4G0800

Dist.-Co.-Rte. (PM/PM) | EA

Supporting documentation of all California Environmental Quality Act (CEQA) checklist determinations is provided in Chapter 2 of this Initial Study/Environmental Assessment (IS/EA). Documentation of "No Impact" determinations is provided at the beginning of Chapter 2. Discussion of all impacts, avoidance, minimization, and/or mitigation measures is under the appropriate topic headings in Chapter 2.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

X. LAND USE AND PLANNING: Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

XI. MINERAL RESOURCES: Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

XV. RECREATION:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

XVI. TRANSPORTATION/TRAFFIC: Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

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APPENDIX B

4(f) Evaluation

Resources Evaluated Relative to the Requirements of Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 United States Code (USC) 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) specifies that the Secretary [of Transportation] may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Department of Agriculture and the Department of Housing and Urban Development in developing transportation projects and programs that use lands protected by Section 4(f). If historic sites are involved, then coordination with the State Historic Preservation Officer (SHPO) is also needed.

This section of the document discusses parks, recreational facilities, wildlife refuges and historic properties found within or next to the Build Alternative project limits that do not trigger Section 4(f) protection because either: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, 4) the project does not permanently use the property and does not hinder the preservation of the property, or 5) the proximity impacts do not result in constructive use.

PROJECT DESCRIPTION

The California Department of Transportation (Caltrans), in cooperation with the Solano Transportation Authority (STA) and the Metropolitan Transportation Commission (MTC), proposes to provide High Occupancy Vehicle/High Occupancy Toll lanes (HOV/HOT or express lanes) in both westbound and eastbound directions of Interstate 80 (I-80) from west of Red Top Road to east of Interstate 505 (I-505), within Solano County, California. The I-80 Express Lanes Project (project) would construct approximately 18 miles of express lanes in the I-80 corridor through conversion of existing HOV lanes and highway widening for new express lanes. The project limit is approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. The general location of the proposed improvements extends along I-80 from post mile (PM) R10.4 to 30.2 and passing through the cities of Fairfield and Vacaville.

The project may be constructed under a single construction contract or in phases depending on available funding. If phasing occurs, the first phase of the project (West Segment) would include the conversion of the existing HOV lane to a new express lane facility along I-80 from the Red Top Road interchange to the Air Base Parkway interchange, including the area around the I-80/I-680 interchange. In the West Segment, existing HOV lanes in both the eastbound and westbound directions would be restriped and repurposed into express lanes. The second phase (East Segment) would construct a new express lane in both the eastbound and westbound directions of I-80 from the Air Base Parkway interchange through the I-80/I-505 interchange. The Build Alternative comprises both the West Segment and East Segment.

Within the West Segment of the project limits, the conversion of the existing HOV lane to an express lane would not require outside widening. Similarly, the majority of the proposed new express lane within the East Segment of the project limits would be accommodated through pavement widening within the I-80 median, and thereby reducing the amount of outside widening needed. Since the Build Alternative would not substantially alter the location of I-80, the distance between the parks and recreational facilities and the freeway corridor will not change when compared to existing conditions. The bike paths and bike lanes located adjacent to I-80, and at the various ramp termini intersections, would remain open during construction.

Under the No-Build Alternative, none of the project features described above would be constructed. The freeway travel lanes along the I-80 corridor would remain as they currently exist. No bridge structures would be widened

RESOURCES EVALUATED RELATIVE TO THE REQUIREMENTS OF SECTION 4(F)

Build Alternative

Build Alternative' s Area of Potential Effects (APE)[1] encompasses all areas that fall within the physical footprint of the proposed improvements and areas that may either be directly or indirectly affected by project-related construction activities. The APE covers 20 miles, encompassing approximately 920 acres. In addition to representing the full project footprint and the full horizontal extent of all potential project activities, the archaeological APE includes a vertical extent to encompass all project-related earthmoving construction activities.

There are no wildlife or waterfowl refuges within the project vicinity. The closest federal wildlife refuge is the San Pablo Bay National Wildlife Refuge, located over 29 miles west of the project limits. The closest state wildlife area is the Grizzly Island Wildlife Refuge located 2.5 miles east of the project limits near the I-80 and I-680 interchange in Cordelia. Owing to the substantial distance from the project limits to the closest wildlife/waterfowl refuge, the proposed project would not have any reasonably foreseeable direct, temporary, or constructive use of any wildlife or waterfowl refuge area. Therefore, the provisions of Section 4(f) for wildlife or waterfowl resources are not triggered.

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[1] APE comprises Architectural APE and Archaeological APE. Consistent with Caltrans policies and general cultural resource practices, the Architectural APE includes the area directly impacted by construction. The archaeological APE includes all areas where ground disturbance is possible and incorporates the boundaries of all previously identified archaeological sites that intersect the Project Study Limits.

Table 1, below, lists the Section 4(f) resources in the project vicinity, except archaeological sites. There are 23 parks and recreation facilities, one historic site and four archaeological sites within 0.5 miles of the Build Alternative. **Figure B-1** shows the locations of the parks and recreation facilities and historical site within 0.5 miles of the Build Alternative.

Table 1 Section 4(f) Properties within 0.5 miles of Project Limits

	Name	Address
Parks and Recreation Facilities		
1	Alamo School Park	535 Edgewood Drive, Vacaville, CA 95688
2	Andrews Park	Monte Vista Avenue and School St., Vacaville, CA 95688
3	City Hall Park	Walnut Street, Vacaville, CA 95688
4	Dunnell Property (project under design)	3351 Hilborn Road, Fairfield, CA 94533
5	Hayes & Utah Street ~ Tot Lot	1101 Hayes Street, Fairfield, CA 94533
6	Hillview Neighborhood Park	300 Atlantic Avenue, Fairfield, CA 94533
7	Kentucky Street ~ Tot Lot	1740 Kentucky Street, Fairfield, CA 94533
8	Lagoon Valley Park	1 Pena Adobe Road, Vacaville, CA 95688
9	Linear Park Playground @ 2nd Street	2nd St. & Linear Trail, Fairfield, CA 94533
10	Linear Park Playground @ 5th Street	5th St. & Linear Trail, Fairfield, CA 94533
11	Mankas Neighborhood Park	2800 Owens Street, Fairfield, CA 94533
12	McBride Senior Center	91 Town Square Place, Vacaville, CA 95688
13	Meadow Glen Neighborhood Park	2800 Parkview Terrace, Fairfield, CA 94533
14	North Orchard Park	675 S. Orchard Avenue, Vacaville, CA 95688
15	Rolling Hills Neighborhood Park	3520 Glenwood Drive, Fairfield, CA 94533
16	Senior Center Park	Ulatis Creek, Vacaville, CA 95688
17	Three Oaks Community Center	1100 Alamo Drive, Vacaville, CA 95688
18	Ulatis Community Center	1000 Ulatis Drive, Vacaville, CA 95688
19	Ulatis Gardens	1000 Ulatis Drive, Vacaville, CA 95688
20	Veterans Memorial Park	2050 Fairfield Avenue, Fairfield, CA 94533
21	Vintage Green Valley Neighborhood Park	600 Vintage Valley Drive, Fairfield, CA 94533
22	Willows Park	Ogden Way and Marshall Road, Vacaville, CA 95687
23	Woodcreek Neighborhood Park	1470 Astoria Drive, Fairfield, CA 94533
Historic Sites		
24	Pena Adobe	301 Pena Adobe Road, Vacaville, CA 95688

Sources: Caltrans 2014d; Google Earth, 2014

Legend

- West Segment
- East Segment
- Parks and Recreation Facilities
- Historic Sites

1. Alamo School Park
2. Andrews Park
3. City Hall Park
4. Dunnell Property (project under design)
5. Hayes & Utah Street ~ Tot Lot
6. Hillview Neighborhood Park
7. Kentucky Street ~ Tot Lot
8. Lagoon Valley Park
9. Linear Park Playground @ 2nd Street
10. Linear Park Playground @ 5th Street
11. Mankas Neighborhood Park
12. McBride Senior Center
13. Meadow Glen Neighborhood Park
14. North Orchard Park
15. Rolling Hills Neighborhood Park
16. Senior Center Park
17. Three Oaks Community Center
18. Ulatis Community Center
19. Ulatis Gardens
20. Veterans Memorial Park
21. Vintage Green Valley Neighborhood Park
22. Willows Park
23. Woodcreek Neighborhood Park
24. Pena Adobe

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MILES

Section 4(f) Properties

Figure **B-1**

Source: Circlepoint, 2015

For the purposes of Section 4(f), a project must result in use of a 4(f) resource to trigger the provisions of Section 4(f). There are three types of use: permanent, temporary occupancy, and constructive use. The most common form of use, permanent use is when a property is incorporated into a project via land acquisition. Temporary occupancy results when a Section 4(f) property, in whole or in part, is required for project construction-related activities. The property is not permanently incorporated into a transportation facility but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f). Lastly, a constructive use occurs when the proximity impacts of a proposed project adjacent to, or nearby, a Section 4(f) property result in substantial impairment to the property's activities, features, or attributes that qualify the property for protection under Section 4(f).

Parks and Recreation Properties

Andrews Park, City Hall Park, North Orchard Park, Senior Center Park, Ulatis Gardens, and Willows Park are all Section 4(f) resources because they are publically owned, locally significant parks that are open to the public. Based on the definitions of use listed above, no impacts to these parks would result from the Build Alternative because no permanent, temporary, or constructive uses would occur. Therefore, the provisions of Section 4(f) are not triggered.

Alamo School Park, located near the project in Vacaville, is a Section 4(f) resource because Alamo School's playground is open to the public and serves either significant organized or substantial walk-on recreational purposes. Based on the definitions of use listed above, no impacts to Alamo School Park will result from the Build Alternative because no permanent, temporary, or constructive uses would occur. Therefore, the provisions of Section 4(f) are not triggered.

Vacaville also hosts three recreational facilities: McBride Senior Center, Three Oaks Community Center, and Ulatis Community Center. They are all publically owned, locally significant recreational facilities that are open to the public during normal hours of operation. The facilities can be reserved for a fee, but the assessment of a user fee is generally related to the operation and maintenance of the facility and does not in and of itself negate the property's status as a Section 4(f) property. Based on the definitions of use listed above, no impacts to McBride Senior Center, Three Oaks Community Center, or Ulatis Community Center will result from the Build Alternative because no permanent, temporary, or constructive uses would occur. Therefore, the provisions of Section 4(f) are not triggered.

The Dunnell Property is 6.2 acres of land left to the City of Fairfield for the purposes of a park, by the Dunnell family. The property sits adjacent to 770 acres of city-owned open space. Plans to create a park at the Dunnell Property were approved in 2004 and the park is currently under construction. In addition to the Dunnell Property, the Hayes & Utah Street Tot Lot, Hillview Neighborhood Park, Kentucky Street Tot Lot, Mankas Neighborhood Park, Meadow Glen Neighborhood Park, Rolling Hills Neighborhood Park, Veterans Memorial Park, Vintage Green Valley Neighborhood Park, and Woodcreek Neighborhood Park are all Section 4(f) resources in

the City of Fairfield because they are publically owned, locally significant parks that are open to the public. Based on the definitions of use listed above**,** no impacts to any of the above listed parks will result from the Build Alternative because no permanent, temporary, or constructive uses would occur. Therefore, the provisions of Section 4(f) are not triggered.

The Fairfield Linear Park Playground at 2nd Street and the Linear Park Playground at 5th Street compose the greater Linear Park, and for the purposes of this evaluation will be referred to as the Fairfield Linear Park. The Fairfield Linear Park is located adjacent to the project limits. It it considered a Section 4(f) resource because it is a publically owned, locally significant park that is open to the public. The Build Alternative would not result in an increase in population in the areas surrounding the I-80 corridor (see **Section 2.1.3, Growth**); therefore, additional demand on the park facilities is not anticipated. The Build Alternative would not substantially impair the aesthetic features or attributes of Fairfield Linear Park (see **Section 2.1.8 Visual/Aesthetics**), as existing views are limited and the improvements proposed will not substantially impede the viewsheds from the park and will maintain or replace existing landscape screening. Potential increases in ambient noise levels for the areas immediately adjacent to I-80 are discussed in **Section 2.2.7, Noise**, which concludes that that noise levels under the Build Alternative are predicted to increase by one decibel along the Fairfield Linear Park. A one decibel increase is not perceivable to the human ear and not considered substantial, in accordance with *Caltrans' Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (2011)*. Potential air quality impacts are discussed in **Section 2.2.6, Air Quality**, which concludes that implementation of construction period minimization measures will reduce any air quality impacts resulting from construction activities. No substantial long-term air quality effects would result from the Build Alternative. Additionally, because the project would require minimal outside widening of I-80, there would be no impacts to water quality, vegetation, wildlife, or accessibility of Fairfield Linear Park. The proposed project Build Alternative will not cause a constructive use of Fairfield Linear Park because the proximity impacts will not substantially impair the protected activities, features, or attributes of the park.

Lagoon Valley Park is located adjacent to I-80 in the City of Vacaville. It is a 470-acre park with barbeque areas, bike trails, hiking trails, a lake, a horseshoe pit, and a multi-purpose field. The park also includes a 30,000 square foot fenced in dog park. The Build Alternative would not result in an increase in population in the areas surrounding the I-80 corridor (see **Section 2.1.3, Growth**); therefore because Lagoon Valley Park serves the area surrounding the I-80 corridor, additional demand on the park facilities is not anticipated. The Build Alternative would not substantially impair the aesthetic features or attributes of Lagoon Valley Park (see **Section 2.1.8 Visual/Aesthetics**), as existing views are limited and the improvements proposed will not substantially impede the viewsheds from the park and will maintain or replace existing landscape screening. Potential increases in ambient noise levels for the areas immediately adjacent to I-80 are discussed in **Section 2.2.7, Noise**, which concludes that that noise levels under the Build Alternative are predicted to increase by 1 decibel at the Lagoon Valley Park. A 1 decibel increase is not perceivable to the human ear and not considered substantial, in accordance with *Chapter 20 – Section 4(f) of Caltrans Environmental Handbook, Volume 1: Guidance for Compliance*. Potential air quality impacts are discussed in **Section 2.2.6, Air Quality**, which concludes that implementation of construction period minimization measures will reduce any air quality impacts resulting from construction activities. No substantial long-term air quality effects would result from the Build Alternative.

Additionally, because the project would require minimal outside widening of I-80, there would be no impacts to water quality, vegetation, wildlife, or accessibility of Lagoon Valley Park. The proposed project Build Alternative will not cause a constructive use of Lagoon Valley Park because the proximity impacts will not substantially impair the protected activities, features, or attributes of the park.

Given the above, the Build Alternative would not result in permanent, temporary, or constructive use of any park or recreation facilities requiring protection under Section 4(f). Therefore, the provisions of Section 4(f) are not triggered.

Historic Sites

Properties that are on or eligible for the National Register of Historic Places (NRHP), including historic districts, buildings, structures, objects, and certain archaeological sites qualify for Section 4(f) protection. One historic-era property within the architectural APE, the Peña Adobe site (adobe built 1842, annex built 1880), was previously evaluated. It was listed in the NRHP in 1972. An August 2013 field survey found that neither the adobe nor the annex appear to have undergone alterations that would warrant a change in its current NRHP listing. The Build Alternative would have no impact on access to this historic site due to its distance from the Build Alternative improvements. Additionally, based on the definitions of use, no impacts to the Peña Adobe site would result from the Build Alternative because no permanent, temporary, or constructive uses would occur. Therefore, the provisions of Section 4(f) are not triggered.

Archaeological Resources

Archaeological resources that are potentially eligible for the NRHP have been located within the Build Alternative's APE. As construction activities could potentially unearth previously identified and unidentified resources, provisions to address these circumstances are included in the Avoidance, Minimization, and/or Mitigation Measures in **Section 2.1.9, Cultural Resources**. Because the Build Alternative would involve construction activities near the archaeological sites, an Environmentally Sensitive Area (ESA) plan was prepared to protect known resources. A testing/treatment plan was established to test for potential cultural resources during project construction. Therefore, the provisions of Section 4(f) are not triggered.

West Segment –First Phase

As previously discussed, the West Segment of the Build Alternative would not impact any park facilities requiring protection under Section 4(f). Section 4(f) resources include publicly-owned parks, recreational areas, and wildlife refuges. **Table 1** and **Figure B-1** identify the few parks that are within 0.5 mile of the West Segment of the Build Alternative, and qualify for consideration under Section 4(f). The Build Alternative would not result in permanent, temporary, or constructive use of any park or recreation facilities requiring protection under Section 4(f). Therefore, the provisions of Section 4(f) for parks and recreation facilities are not triggered for the West Segment.

There are no wildlife refuges on or near the project corridor. Therefore, the proposed Build Alternative, including the West Segment, would have no impact on these resources, nor are the provisions of Section 4(f) for wildlife refuges triggered.

No-Build Alternative

Under the No-Build Alternative, no changes would be made to I-80 within the overall project limits. Under the No-Build Alternative, no property would be acquired, no construction activities would occur, and there would be no change in the operations of the existing freeway facility. Given the above, the No Build Alternative would not result in permanent, temporary, or constructive use of any park or recreation facilities, historic sites, archaeological sites, or wildlife refuges requiring protection under Section 4(f). Therefore, the provisions of Section 4(f) are not triggered.

APPENDIX C

Title VI Policy Statement

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
PHONE (916) 654-5266
FAX (916) 654-6608
TTY 711
www.dot.ca.gov

Flex your power!
Be energy efficient!

March 2013

NON-DISCRIMINATION POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone: (916) 324-0449, TTY: 711, or via Fax: (916) 324-1949.

MALCOLM DOUGHERTY
Director

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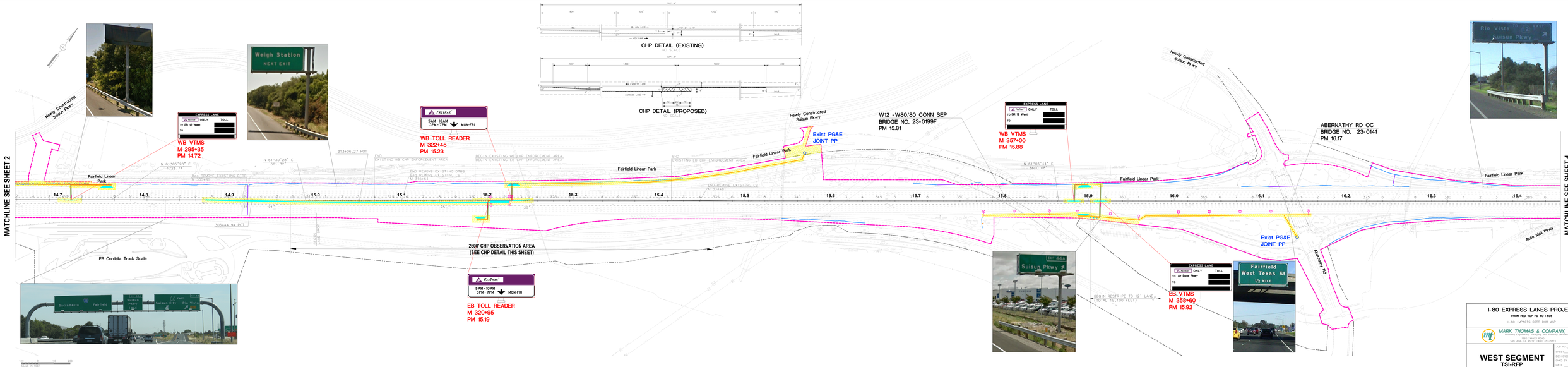
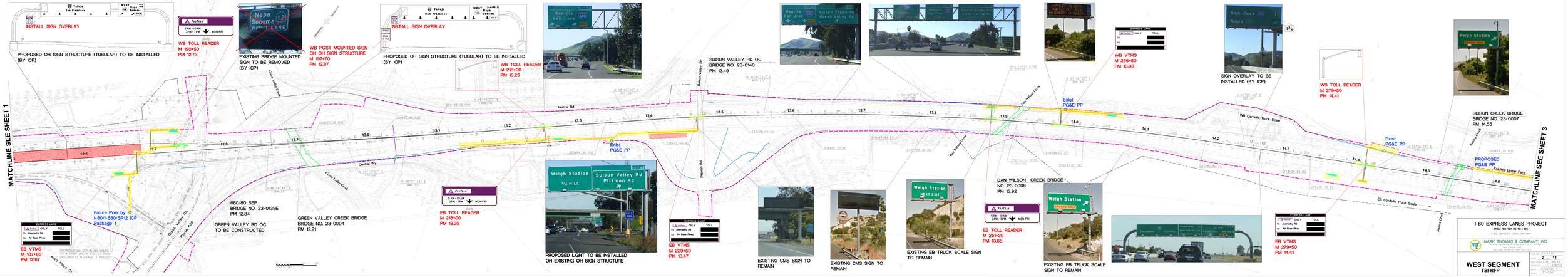
APPENDIX D

Project Layouts

West Segment


MATCHLINE SEE SHEET 2
MATCHLINE SEE SHEET 4
CHP DETAIL (EXISTING)
CHP DETAIL (PROPOSED)
NO SCALE
Newly Constructed Suisun Pkwy
Fairfield Linear Park
EB Cordelia Truck Scale
WB VTMS
M 295+35
PM 14.72
EXPRESS LANE
ONLY
TOLL
TO SR 12 West
WB TOLL READER
M 322+45
PM 15.23
FasTrak
5 AM - 10 AM
3PM - 7PM
MON-FRI
2600' CHP OBSERVATION AREA
(SEE CHP DETAIL THIS SHEET)
EB TOLL READER
M 320+95
PM 15.19
W12 -W80/80 CONN SEP
BRIDGE NO. 23-0199F
PM 15.81
Exist PG&E
JOINT PP
WB VTMS
M 357+00
PM 15.88
ABERNATHY RD OC
BRIDGE NO. 23-0141
PM 16.17
EB VTMS
M 358+60
PM 15.92
TO Air Base Pkwy
Auto Mall Pkwy
Abernathy Rd
Weigh Station
NEXT EXIT
Suisun Pkwy
Fairfield
West Texas St
1/2 MILE
Rio Vista
Suisun Pkwy
Sacramento
Fairfield
Suisun City
Rio Vista
BEGIN RESTRIPE TO 12' LANE (TOTAL 19,100 FEET)
I-80 EXPRESS LANES PROJECT
FROM RED TOP RD TO I-680
I-80 IMPACTS CORRIDOR MAP
MARK THOMAS & COMPANY, INC.
WEST SEGMENT
TSI-RFP
JOB NO. 5-217.1.01
SHEET 3 OF 11
DES'GNED BY M. MALEK
DWG BY A. ZEMOUIE
DATE 6/20/2014
SCALE 1"=100'


MATCHLINE SEE SHEET 1
MATCHLINE SEE SHEET 3
INSTALL SIGN OVERLAY
PROPOSED OH SIGN STRUCTURE (TUBULAR) TO BE INSTALLED (BY ICP)
WB TOLL READER
M 190+50
PM 12.73
EXISTING BRIDGE MOUNTED SIGN TO BE REMOVED (BY ICP)
WB POST MOUNTED SIGN ON OH SIGN STRUCTURE
M 197+70
PM 12.87
INSTALL SIGN OVERLAY
PROPOSED OH SIGN STRUCTURE (TUBULAR) TO BE INSTALLED (BY ICP)
WB TOLL READER
M 218+00
PM 13.25
SUISUN VALLEY RD OC BRIDGE NO. 23-0140
PM 13.49
WB VTMS
M 256+50
PM 13.98
SIGN OVERLAY TO BE INSTALLED (BY ICP)
WB TOLL READER
M 279+50
PM 14.41
SUISUN CREEK BRIDGE BRIDGE NO. 23-0007
PM 14.55
PROPOSED PG&E PP
Fairfield Linear Park
Exist PG&E PP
Exist PG&E PP
Exist PG&E PP
DAN WILSON CREEK BRIDGE NO. 23-0006
PM 13.92
EB TOLL READER
M 251+20
PM 13.88
EB TOLL READER
M 218+00
PM 13.25
EB TOLL READER
M 197+65
PM 12.67
Future Pole by I-80/I-680/SR12 ICP Package 1
680/80 SEP BRIDGE NO. 23-0139E
PM 12.84
GREEN VALLEY RD OC TO BE CONSTRUCTED
GREEN VALLEY CREEK BRIDGE BRIDGE NO. 23-0004
PM 12.91
PROPOSED LIGHT TO BE INSTALLED ON EXISTING OH SIGN STRUCTURE
EB VTMS
M 229+50
PM 13.47
EB VTMS
M 279+50
PM 14.41
EXISTING CMS SIGN TO REMAIN
EXISTING CMS SIGN TO REMAIN
EXISTING EB TRUCK SCALE SIGN TO REMAIN
EXISTING EB TRUCK SCALE SIGN TO REMAIN
WB Cordelia Truck Scale
EB Cordelia Truck Scale
Suisun Valley Rd
Pennsylvin Rd
Nelitzel Rd
Central Wy
Green Valley Rd
Green Valley Creek
Route 680
Auto Plaza Ct
Dan Wilson Creek
Suisun Creek
Weigh Station
Suisun Valley Rd
Pittman Rd
Benicia
San Jose
Napa
Sonoma
Vallejo
San Francisco
Oakland
I-80 EXPRESS LANES PROJECT
FROM RED TOP RD TO I-680
I-80 IMPACTS CORRIDOR MAP
MARK THOMAS & COMPANY, INC.
WEST SEGMENT
TSI-RFP
SHEET 2 OF 11
DRAWN BY M. MIDLEY
CHKD BY R. JONES
DATE 6/20/2014
SCALE 1"=400'

LEGEND/ABBREVIATIONS

VTMS — DYNAMIC MESSAGE SIGN

EXPRESS LANE OVERHEAD SIGN TRUSS

TOLL READER OVERHEAD SIGN TRUSS

LPR CAMERA/PTZ CCTV, MVDS POLE

TZ (TOLL ZONE) CABINET/ VTMS CABINET/ PTZ CCTV AND/OR MVDS POLE CABINETS

OVERHEAD SIGN STRUCTURE

ADDITIONAL LIGHTING FOR NON-STANDARD WEAVE SECTIONS, MODIFIED TRAVIS BOULEVARD OFF-RAMP, AND AT LANE DROP LOCATIONS

LIGHTING FOR EXPRESS LANES PHASE 1 & 2

LIGHTING FOR EXPRESS LANES PHASE 2

POST MOUNTED SIGN

MAINTENANCE VEHICLE PULLOUT

METAL BEAM GUARD RAIL

ELECTRICAL/COMMUNICATION CONDUIT

COMMUNICATION CONDUIT

PACIFIC GAS & ELECTRIC (PG&E) POWER POLE

TELEPHONE SERVICE POINT

TELEPHONE DEMARCATION CABINET

EXISTING MEDIAN BARRIER

EXISTING DOUBLE THREE BEAM BARRIER

EXISTING METAL BEAM GUARD RAIL

EXISTING SOUND WALL

EXISTING MAINTENANCE VEHICLE PULLOUT

EXISTING BRIDGE

EXISTING RUN

EXPRESS LANE

DOUBLE THREE BEAM BARRIER

CONCRETE BARRIER

EXISTING LIGHTING

PP — Pacific Gas & Electric (PG&E) Power Pole

TSP — Telephone Service Point

TDC — Telephone Demarcation Cabinet

CALIFORNIA HIGHWAY PATROL (CHP) CRUISER PAD

PRELIMINARY STUDY LIMIT

CULVERT

SEASONAL DRAINAGE

CREEK BEDS/BANKS

WETLAND AREA

RIPARIAN TREE SURVEY

TREE CONFLICT – CLEAR RECOVERY ZONE

PERMANENT IMPACT

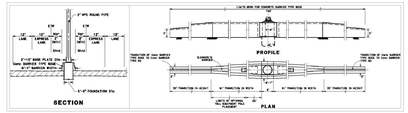
TEMPORARY IMPACT (STAGING AREAS)

PROPOSED CONDUIT – TRENCHED

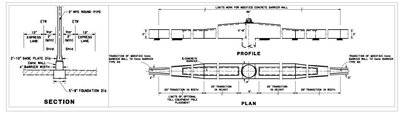
PROPOSED CONDUIT – BORED

TEMPORARY IMPACT (WORK AREAS)

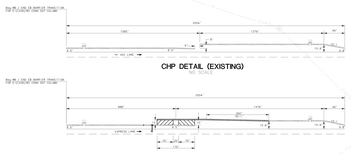
HUB



STANDARD OVERHEAD SIGN FOUNDATION



MODIFIED OVERHEAD SIGN FOUNDATION
(BURIED FOUNDATION WITH CONCRETE WALL)



EXISTING OH SIGN STRUCTURE TO BE REMOVED (BY ICP)

EXPRESS RESTRICTION ENDS

WB OH SIGN TRUSS
M 172+77
PM 12.39

CORDELIA UP
BRIDGE NO. 23-0025
PM 11.82

E12-E80/80 CONN SEP
BRIDGE NO. 23-0169
PM 11.98

RED TOP ROAD UC
BRIDGE NO. 23-0165
PM 11.39

Exist
PG&E SERVICE

Exist
PG&E PP

Exist
PG&E
PP

MATCHLINE SEE SHEET 2

EB OH SIGN TRUSS
M 70+30
PM 10.45

EB VTMS
M 83+50
PM 10.70

EB OH SIGN TRUSS
M 96+70
PM 10.95

EB OH SIGN TRUSS
M 123+10
PM 11.45

EB TOLL READER
M 132+00
PM 11.62

EB VTMS
M 157+95
PM 12.11

147'6" CHP OBSERVATION AREA
(SEE CHP DETAIL THIS SHEET)

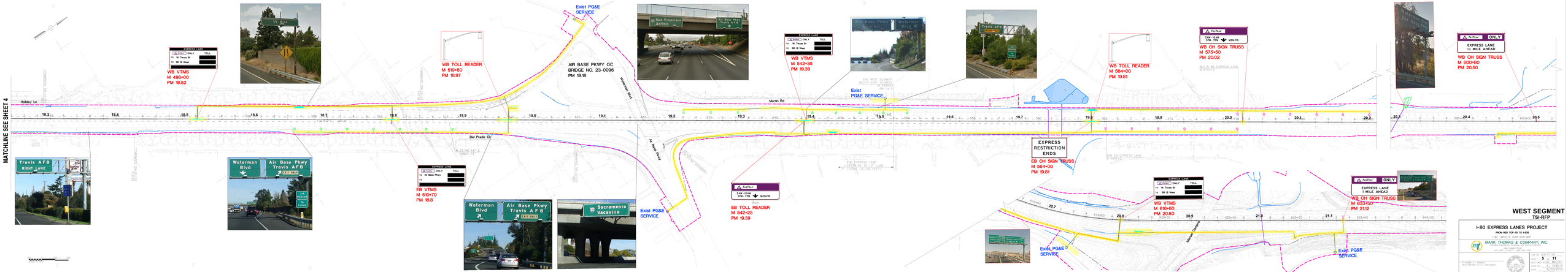
I-80 EXPRESS LANES PROJECT
FROM RED TOP RD TO I-680
I-80 IMPACTS CORRIDOR MAP

MARK THOMAS & COMPANY, INC.
1901 HARBOR BAY PARKWAY
SAN JOSE, CA 95815
See Joint Ventures Page

WEST SEGMENT
TSI-RFP

SHEET 1 OF 11

DRAWN BY: R. BUTTERFIELD
DATE: 6/20/2014
CHECKED BY: M. MINLEY
DATE: 6/20/2014
SCALE: 1"=400'


MATCHLINE SEE SHEET 4
Holiday Ln
Martin Rd
Del Prado Ct
Waterman Blvd
Air Base Pkwy
Mason Cemetery
EXPRESS LANE
ONLY
TOLL
TO: W. Texas St
TO: SR 12 West
WB VTMS
M 496+00
PM 18.52
WB TOLL READER
M 519+80
PM 18.97
AIR BASE PKWY OC
BRIDGE NO. 23-0096
PM 19.18
Exist PG&E SERVICE
WB VTMS
M 542+35
PM 19.39
Exist PG&E SERVICE
WB TOLL READER
M 564+00
PM 19.61
WB OH SIGN TRUSS
M 575+50
PM 20.02
WB OH SIGN TRUSS
M 600+80
PM 20.50
EXPRESS LANE
1 MILE AHEAD
EXPRESS RESTRICTION ENDS
EB OH SIGN TRUSS
M 564+00
PM 19.61
EB VTMS
M 510+70
PM 18.8
EB TOLL READER
M 542+25
PM 19.39
WB VTMS
M 616+60
PM 20.80
WB OH SIGN TRUSS
M 633+50
PM 21.12
Exist PG&E SERVICE
Exist PG&E SERVICE
Exist PG&E SERVICE
Travis AFB
RIGHT LANE
Waterman Blvd
Air Base Pkwy
Travis AFB
EXIT ONLY
Waterman Blvd
Air Base Pkwy
Travis AFB
EXIT ONLY
Sacramento
Vacaville
San Francisco
Airport
SR 84 West
Travis AFB
1 MILE
WEST SEGMENT
TSI-RFP
I-80 EXPRESS LANES PROJECT
FROM: PM 18.0 TO: PM 19.0
EB: IMPACTS CORR / DOR MPO
MARK THOMAS & COMPANY, INC.
PROFESSIONAL ENGINEERS
ONE CIVIL TO SAFETY
SHEET 5 OF 11
DESIGNED: M. MILLER
DRAWN BY: J. ZUNCIC
DATE: 6/20/2014
SCALE: 1"=100'
RICHARD A. TANNER
REGISTERED CIVIL ENGINEER

MATCHLINE SEE SHEET 3

FasTrak
5 AM - 10 AM
3 PM - 7 PM
MON-FRI

WB TOLL READER
M 407+30
PM 16.83

FasTrak
5 AM - 10 AM
3 PM - 7 PM
MON-FRI

EB TOLL READER
M 407+30
PM 16.83

Exist PG&E PP

Fairfield Linear Park

Auto Mall Pkwy

"M" LINE

16.5 16.6 16.7 16.8 16.9 17.0 17.1 17.2 17.3 17.4 17.5 17.6 17.7 17.8 17.9 18.0 18.1 18.2

N 61°05'44" E
8600.08'

408+22.64 EC

399+06.34 BC

N 71°38'44" E
400.00'

Beg Exist DTBB
W 410+78

412+22.64 BC

END Exist DTBB
W 416+08

Ledgewood Creek

LEDGEWOOD CREEK BRIDGE
BRIDGE NO. 23-0008
PM 17.02

W. TEXAS ST UC
BRIDGE NO. 23-0106
PM 17.20

Rockville Rd

428+73.07 EC

W. FAIRFIELD PUC
BRIDGE NO. 23-0093
PM 17.27

Oliver Rd

W Texas St

EXPRESS LANE
FasTrak ONLY TOLL
To SR 12 West
To

WB VTMS
M 441+25
PM 17.48

Exist PG&E SERVICE

EXPRESS LANE
FasTrak ONLY TOLL
To Air Base Pkwy
To

EB VTMS
M 441+25
PM 17.48

TRAVIS BLVD OC
BRIDGE NO. 23-0061
PM 17.93

N 33°48'14" E
10527.75'

Travis Blvd

Holiday Ln

FasTrak
5 AM - 10 AM
3 PM - 7 PM
MON-FRI

WB TOLL READER
M 474+40
PM 18.10

Exist PG&E SERVICE

FasTrak
5 AM - 10 AM
3 PM - 7 PM
MON-FRI

EB TOLL READER
M 477+00
PM 18.15

MATCHLINE SEE SHEET 5

Travis Blvd
WEST
EXIT ONLY
EAST

PROPOSED OVERHEAD SIGN STRUCTURE TO BE INSTALLED

EXISTING OVERHEAD SIGN STRUCTURES TO BE REMOVED

INSTALL SIGN OVERLAY

EXISTING BRIDGE MOUNTED SIGNS TO REMAIN

I-80 EXPRESS LANES PROJECT
FROM RED TOP RD TO I-680
I-80 IMPACTS CORRIDOR MAP

MARK THOMAS & COMPANY, INC.
ENGINEERING PLANNING SURVEYING ENVIRONMENTAL SCIENCE
1960 ZANKER ROAD
San JOSE, CA 95112 (408) 453-5313

WEST SEGMENT
TSI-RFP

JOB NO. 04-111-120
SHEET 4 OF 11
DES/CHKD BY M. MALEKI
DWG BY A. ZEMOIE
DATE 6/20/2014
SCALE 1"=100'

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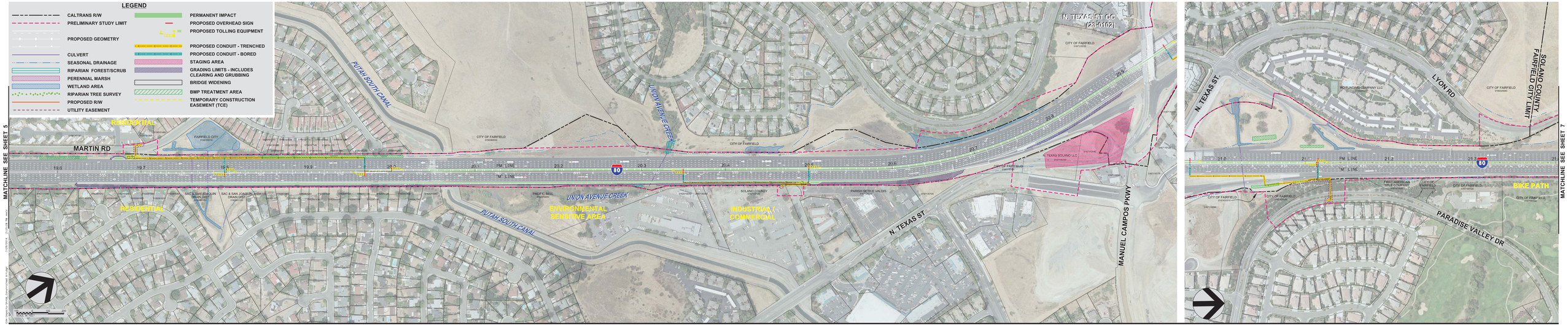
East Segment



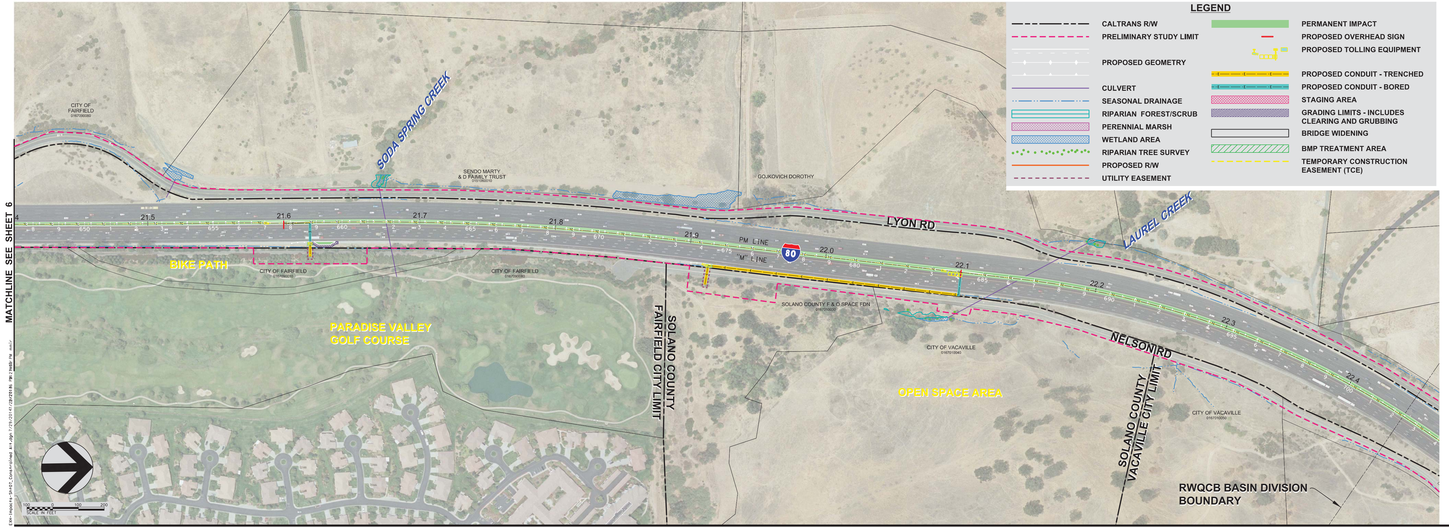
JULY 2014

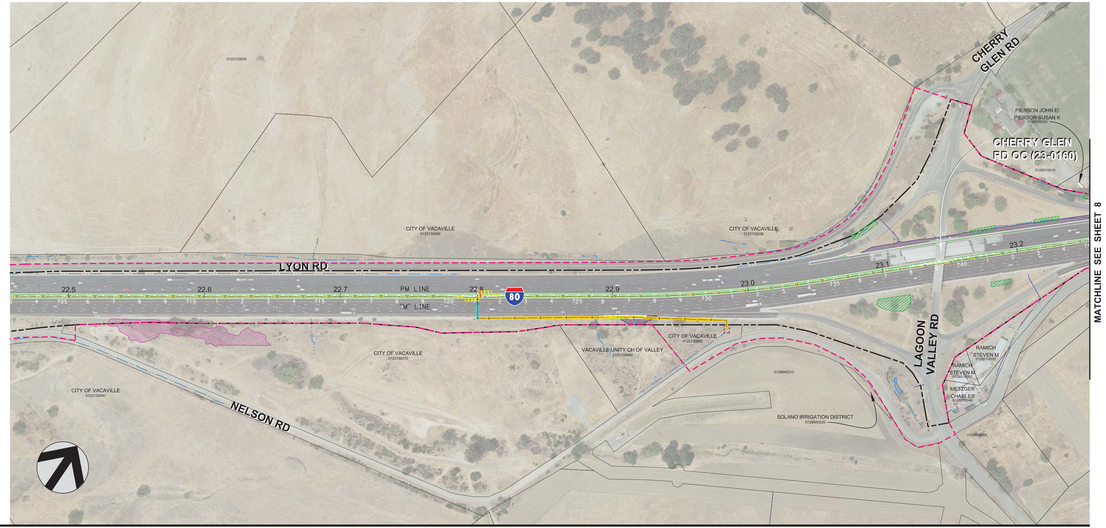
STRA HDR

I-80 CONSTRAINED ALTERNATIVE IMPACTS CORRIDOR MAP

I-80 Express Lanes Project - EAST SEGMENT - AIR BASE PARKWAY TO INTERSTATE 505

SHEET 6 OF 11





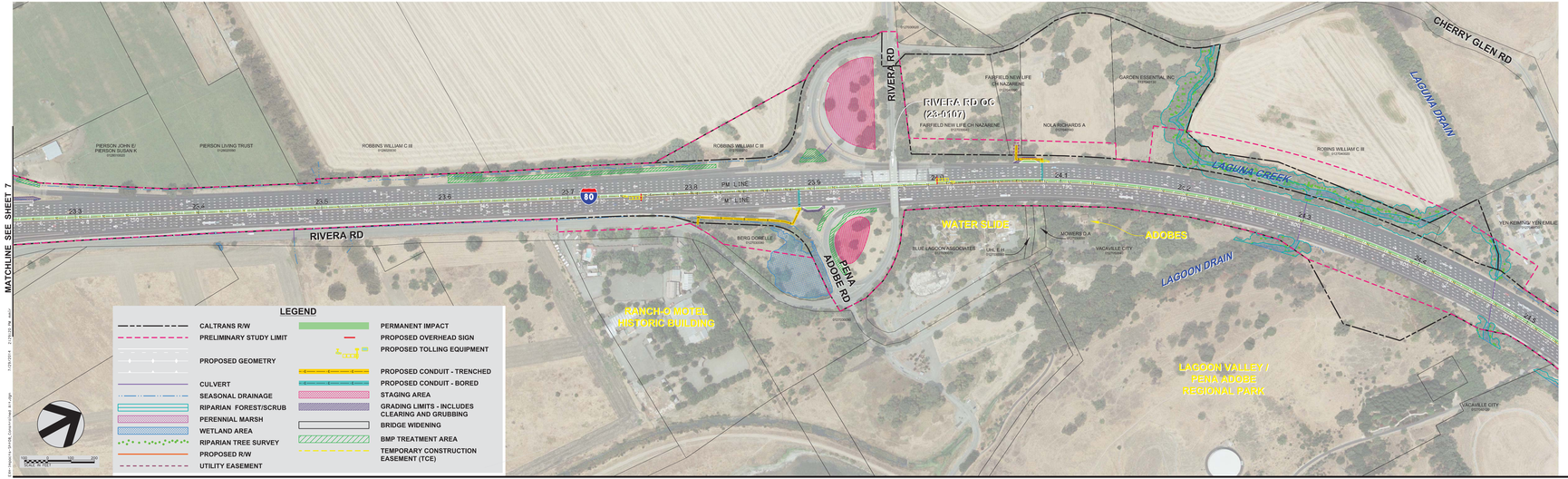
JULY 2014

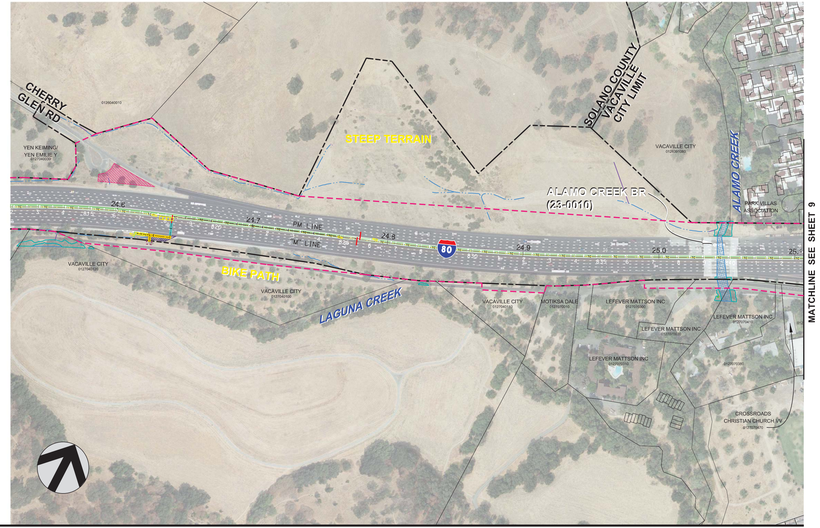
STA HDR

I-80 CONSTRAINED ALTERNATIVE IMPACTS CORRIDOR MAP

I-80 Express Lanes Project - EAST SEGMENT - AIR BASE PARKWAY TO INTERSTATE 505

SHEET 7 OF 11





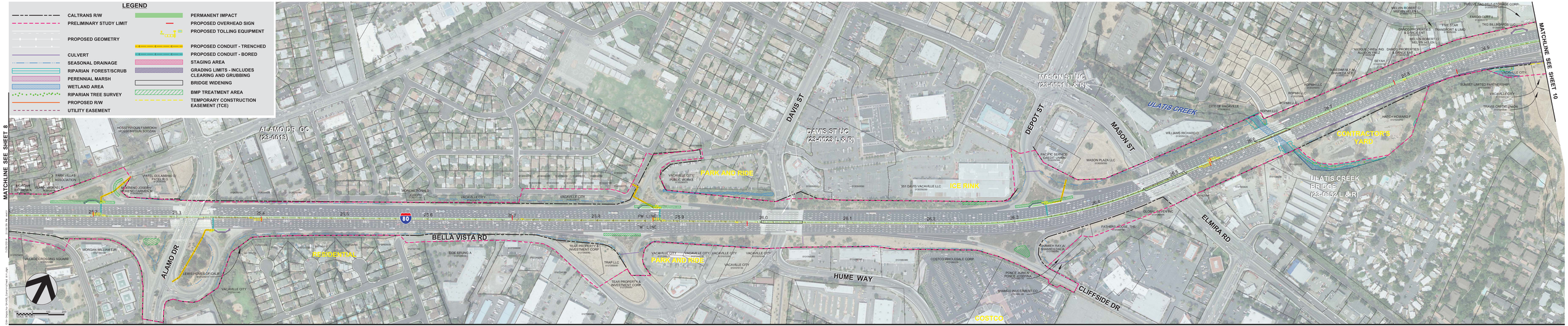
JULY 2014

STA HDR

I-80 CONSTRAINED ALTERNATIVE IMPACTS CORRIDOR MAP

I-80 Express Lanes Project - EAST SEGMENT - AIR BASE PARKWAY TO INTERSTATE 505

SHEET 8 OF 11


LEGEND
CALTRANS R/W
PRELIMINARY STUDY LIMIT
PROPOSED GEOMETRY
CULVERT
SEASONAL DRAINAGE
RIPARIAN FOREST/SCRUB
PERENNIAL MARSH
WETLAND AREA
RIPARIAN TREE SURVEY
PROPOSED R/W
UTILITY EASEMENT
PERMANENT IMPACT
PROPOSED OVERHEAD SIGN
PROPOSED TOLLING EQUIPMENT
PROPOSED CONDUIT - TRENCHED
PROPOSED CONDUIT - BORED
STAGING AREA
GRADING LIMITS - INCLUDES CLEARING AND GRUBBING
BRIDGE WIDENING
BMP TREATMENT AREA
TEMPORARY CONSTRUCTION EASEMENT (TCE)
MATCHLINE SEE SHEET 8
MATCHLINE SEE SHEET 10
ALAMO DR OC (23-0013)
DAVIS ST
DAVIS ST UC (23-0023 L & R)
MASON ST UC (23-0051 L & R)
DEPOT ST
MASON ST
ULATIS CREEK
ULATIS CREEK BRIDGE (23-0062 L & R)
CONTRACTOR'S YARD
PARK AND RIDE
ICE RINK
BELLA VISTA RD
ALAMO DR
RESIDENTIAL
HUME WAY
COSTCO
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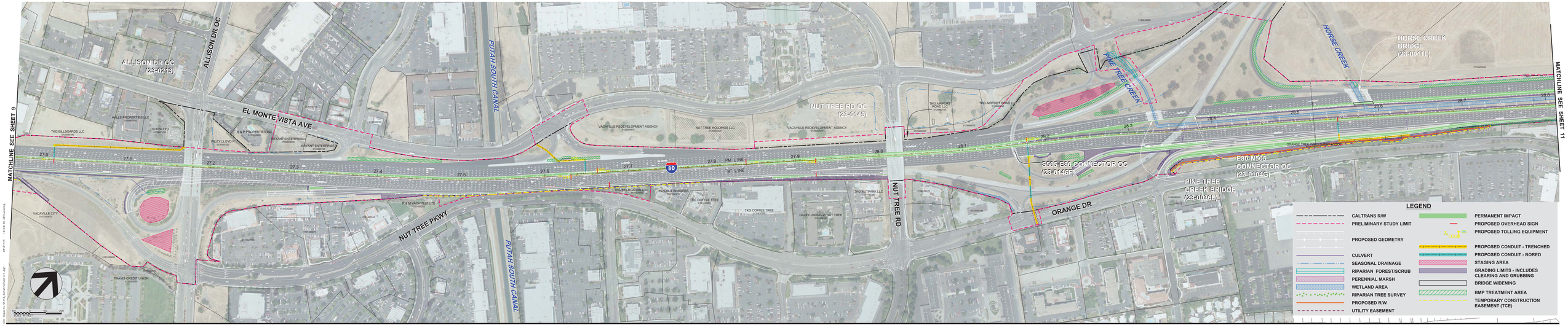

JULY 2014

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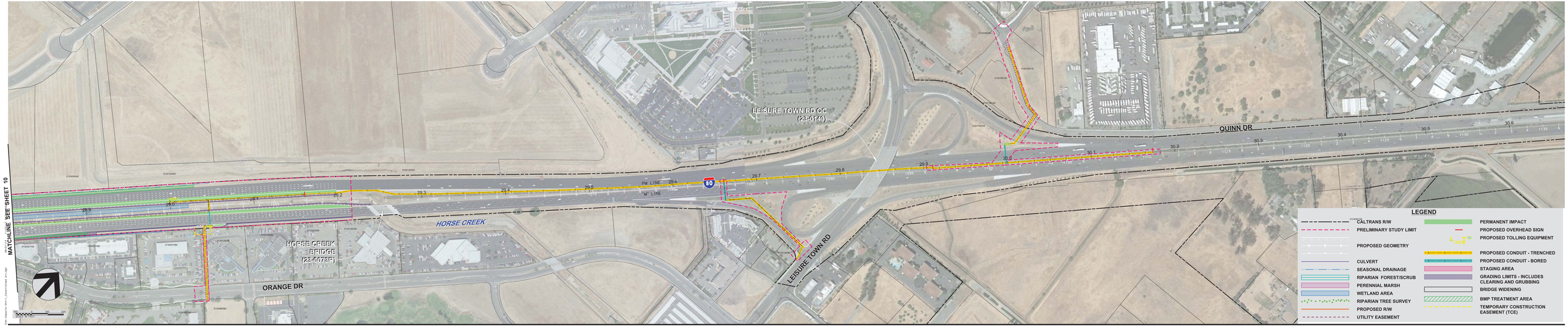
I-80 CONSTRAINED ALTERNATIVE IMPACTS CORRIDOR MAP

I-80 Express Lanes Project - EAST SEGMENT - AIR BASE PARKWAY TO INTERSTATE 505

SHEET 10 OF 11



JULY 2014

I-80 CONSTRAINED ALTERNATIVE IMPACTS CORRIDOR MAP

I-80 Express Lanes Project - EAST SEGMENT - AIR BASE PARKWAY TO INTERSTATE 505

SHEET 11 OF 11

APPENDIX E

Avoidance, Minimization, and/or Mitigation Summary

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Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Farmland					Initial	Date		Initial	Date
Measure FRM-1: Caltrans will comply with Government Code Section 51293(d), ensuring that the land surface disturbed for the relocation of utilities will be restored to its original conditions.	Caltrans	Construction/ Post-Construction							
Utility/Emergency Services									
Measure UTL-1: Detailed utility coordination and verification will be required during the final design phase of the project. The locations of the utilities will not be determined until final design, in coordination with the affected utility owner.	Caltrans	Final Design Phase							
Traffic and Transportation									
Measure TRA-1: A Traffic Management Plan (TMP) should be prepared during the detailed design phase for the Build Alternative, in accordance with Caltrans requirements and guidelines. The TMP should address traffic impacts from staged construction, detours, and specific traffic handling concerns during construction of the project. The objective of the TMP is to minimize the impacts that construction activities would have on the traveling public. Traffic management strategies that require action by the construction contractor should be presented in detail in the Build Alternative's technical specifications of the bid contract, and should be considered part of the project. In implementing the TMP, Caltrans should produce and disseminate press releases and other documents, as necessary, to adequately notify and inform motorists, business community groups, local entities, emergency services, and elected officials of upcoming road closures and detours. This responsibility includes advance notification to local newspapers, television and radio stations, and emergency response providers. Caltrans construction staff should also submit weekly information regarding the daily traffic impacts to State facilities to the Caltrans District 4 Public Information Office. This information should be included in the Weekly Traffic Updates, which are dispersed to all news media outlets and other interested agencies.	Caltrans	Final Design Phase							
Visual/Aesthetics									
Measure VIS-1: Existing landscaping and other roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. Replacement planting would be accomplished as a separate contract, funded from the parent roadway contract, and would include a three-year plant establishment period. Landscape plans shall be developed during the final design phases and be approved by Caltrans.	Caltrans/ Contractor	Final Design Phase							
Measure VIS-2: Replacement landscaping within the designated Landscaped Freeway location between post miles 15.52 and 16.27 (between the Cordelia Truck Scales and Abernathy Road overcrossing) and post miles 17.03 and 19.71 (from just west of the West Texas Street undercrossing to the Air Base Parkway overcrossing) will be designed such that the criteria for the Landscaped Freeway will be maintained. In these areas, planting must be continuous (no gaps ≥ 200 feet), ornamental (not functional), a least 1,000 feet long, on at least one side of the freeway, and require reasonable maintenance.	Caltrans/ Contractor	Final Design Phase							
Measure VIS-3: To reduce the visual impact of new retaining walls, aesthetic treatments consisting of color, texture and/or patterning will be applied to reduce visual impacts. The aesthetic treatment shall be context sensitive to the location and be compatible with existing walls in the project area. If concrete drainage ditches are required along the top of and behind the retaining walls, the ditch should be stained to match the overall color of the wall. Necessary earthwork shall include slope rounding and contour grading where feasible. Aesthetic treatments shall be developed during the final design phases and be approved by Caltrans.	Design Engineer	Final Design Phase							
Measure VIS-4: Where required, retaining wall cable safety railing should have black or brown vinyl cladding to make them less obtrusive and help them blend with the setting.	Design Engineer	Final Design Phase							
Measure VIS-5: Concrete safety-shaped barriers should be sand blasted to a medium finish to minimize glare and deter graffiti. Barriers at the bottom of retaining walls should be stained to match the overall wall color if deemed appropriate by the Office of Landscape Architecture during the design phase.	Design Engineer	Final Design Phase							
Measure VIS-6: As directed by Caltrans, appropriate light and glare screening measures will be used at the Construction Staging Areas including the use of downward cast lighting.	Caltrans/ Contractor	During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Cultural Resources									
Measure CUL-1: If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archeologist can assess the nature and significance of the find. Additional study or survey will be needed if the project design changes or project limits are extended beyond the present survey limits.	Contractor	During Construction							
Measure CUL-2: If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact District 4 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.	Contractor	During Construction							
Measure CUL-3: Per the ESA Action Plan, unintentional adverse effects on archeological resources will be avoided by establishing ESAs around the known archaeological site boundaries within the APE. A summary of the ESA Action Plan tasks are outlined below. Caltrans shall inform interested Native Americans about the proposed project activities and the ESA Action Plan prior to construction. • The Caltrans Archeologist will review the final design package to ensure that the ESAs are appropriately included in the plans and specifications, and can clearly guide construction, and will notify the appropriate Native American group. • At least three weeks in advance, the Caltrans Resident Engineer and Archaeologist will coordinate to clearly delineate and install the ESAs, as specified in the design package. The Caltrans Archeologist will supervise and monitor ESA fence installation. • Prior to construction workers shall be informed of the ESAs and expectations. The ESAs will be discussed during a pre-construction meeting. The importance of the ESAs will be discussed with construction personnel and it will be stressed that no construction activity (including storing or staging of equipment or materials) should occur within an ESA and that workers must remain outside of the ESAs at all times. Construction personnel will be informed of historic preservation laws that protect archaeological sites against any disturbance or removal of artifacts. The ESA boundaries, expected activities, and equipment should be defined. Workers should be educated about what cultural materials might be encountered, to stop work if any are encountered, and how to communicate with the Caltrans Archeologist. • The Caltrans Archeologist will be notified when construction begins and will inspect the construction area on a periodic basis to ensure that the ESAs are not breached. • The Resident Engineer will inform the Caltrans Archeologist when construction is finished. The Contractor, under supervision of the Caltrans Archeologist, will remove temporary ESA fencing at the conclusion of construction.	Caltrans Archaeologist	Pre-Construction/ During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Hydrology and Floodplain									
HYDR-1: Construction of the Build Alternative will be planned so as to avoid adverse effects to the natural and beneficial floodplain values to the maximum extent practicable. Any impacts to the natural and beneficial floodplain values would be reduced with re-vegetation, storm water treatment, or other requirements as designated by the relevant permits.	Design Engineer	Final Design Phase/ Pre-Construction							
Water Quality and Storm Water Runoff									
Measure WQ-1: Pursuant to the Construction General Permit, A Storm Water Pollution Prevention Program (SWPPP) would be developed for the project and would comply with the Caltrans SWMP which includes guidance for Design staff to include special provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. The SWPPP would reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges. **Table 2.2-8** outlines temporary BMPs to be implemented, at a minimum. Further evaluation of the BMPs necessary for the Build Alternative to comply with the permits and other regulatory agency requirements would be detailed during the final design phase. Refer to **Section 2.2.2**, Water Quality and Storm Water Runoff for more detail.	Caltrans/ Contractor	During Construction							
Measure WQ-2: The drainage and landscape elements listed below can be utilized as design pollution prevention BMPs for the Build Alternative, as specified by the Design Engineer. The following elements would be considered during the final design phase: • Consideration of downstream effects related to potentially increased flow: The Build Alternative would discharge into unlined ditches; therefore, necessary erosion control would be applied to the ditches to minimize erosion downstream from potentially increased discharge. • Preservation of existing vegetation: Preserving existing vegetation is beneficial. The Build Alternative would avoid any disturbance beyond what will be necessary to widen the existing transportation facilities. • Concentrated flow conveyance systems: The Build Alternative has the potential to create water gullies, create and modify existing ditches, dikes, and berms, and require the concentration of surface flows. If necessary, flow attenuating devices would be implemented (e.g., flared-end-section, outlet protection/velocity dissipation devices). • Slope/Surface Protection Systems: The Build Alternative would create or modify existing slopes. Necessary erosion control features would be incorporated for work along steep grades. When practicable, slope stability and erosion concerns would be reduced by maintaining or matching existing slopes. • Hydromodification: In order to manage hydromodification, volume-reduction elements may be proposed during the design phase to match, or closely match, the pre- and post-construction hydrographs. Measures to address hydromodification impacts can include structural measures, such as underground detention, and non-structural measures, through the modification of proposed treatment BMPs (see **Measure WQ-3**). The proposed measures must be designed to show that storm water runoff discharge rates and durations match the pre-project conditions within a certain percentage of the peak flow rates during storm events. All creek crossings along the project limits were determined to have a “low risk” for hydromodification, with the exception of Soda Springs Creek, which was determined to have a “moderate risk” for hydromodification. Measures to address hydromodification should be prioritized at Soda Springs Creek, and considered at all the low risk receiving waters. If hydromodification measures are difficult to implement, and the receiving water bodies are “low risk,” then an exemption may be granted, at the discretion of the RWQCBs. A complete hydromodification susceptibility assessment and negation with the RWQCBs will be conducted during the final design phase.	Caltrans	Final Design Phase							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Measure WQ-3: Typical permanent treatment BMPs may include infiltration device such as vegetated basins and/or swales along the roadways that collect storm water runoff. The basins allow pollutants to settle and filter out prior to the storm water entering the drainage systems. Caltrans has an approved list treatment BMPs that have been studied and verified to remove targeted design constituents and provide general pollutant removal. In addition, the San Francisco RWQCB suggests the use of both infiltration and retention devices for pollutant removal or reduction while promoting the effort to mimic predevelopment hydrology by reducing flow rates and velocity and allowing for groundwater recharge. Although retention devices are not currently approved Caltrans BMP devices, the feasibility and determination of preferred treatment BMP type would be coordinated to ensure both Caltrans and regional requirements are met.	Design Engineer	Final Design Phase							
Geology/Soils/Seismic/Topography									
Measure GEO-1: As part of the final design phase, Caltrans requires preparation of the geotechnical design reports that incorporate the results of additional subsurface field work and laboratory testing. Site specific subsurface soil conditions, slope stabilities, and groundwater conditions within the Build Alternative area would be verified during the preparation of these geotechnical design reports. The identification of the site specific soil conditions within the project limits would be used to determine the appropriate final design for the foundations and footings that would support the proposed Build Alternative improvements. Caltrans' standard design and construction guidelines incorporate engineering standards that address seismic risks. Proposed structures including, retaining walls, sound walls, and embankments constructed within the geologic study area would consider seismically-induced liquefaction and settlement during the final design phase. The final design phase would also include the evaluation of the Design Response Spectrum, which measures the ground motion or acceleration caused by the input of a vibration from an earthquake at a specific location and can help understand how structures would respond to earthquakes in a given place.	Design Engineer	Final Design Phase							
Measure GEO 2: With respect to worker safety during construction, OSHA requires employers to comply with hazard-specific safety and health standards. Pursuant to Section 5(a) (1) of Occupational Health and Safety Administration (OSHA), employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Potential seismic-related hazards to workers during construction are expected to be less than substantial with compliance with the OSHA and compliance with Caltrans' standard design and construction guidelines.	Contractor	During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Paleontology									
Mitigation Measure PAL-A: During the final design phase of the project, a qualified professional paleontologist would be retained to both design a monitoring and mitigation program, and implement the program during project-related excavation and earth disturbance activities. The paleontological resource monitoring and mitigation program would include: • preconstruction coordination • construction monitoring • emergency discovery procedures • sampling and data recovery, if needed • preparation, identification, and analysis of the significance of fossil specimens salvaged, if any • museum storage of any specimens and data recovered • reporting This program will be described in the Paleontological Monitoring Program (PMP), which will be prepared by the qualified professional paleontologist during the design phase of the project. The PMP will also describe fieldwork and laboratory methods; curation requirements; report format, content, and distribution; and proposed staff and their qualifications. Prior to the start of construction, the professional paleontologist would conduct a field survey of exposures of sensitive geological units within the construction footprint that would be disturbed. Earth-moving construction activities would be monitored and inspected for the presence of potentially fossiliferous sediments. Ground disturbance and earth-moving activities will only require paleontological mitigation if they will impact a geologic unit of high potential to produce significant fossils either because that unit occurs at the surface or excavation could encounter it at depth. Activities that occur solely within units with low potential to produce significant fossils (i.e., Guinda, Sites, and Funks formations of the Great Valley Sequence; and Holocene Alluvial deposits) and solely within previously disturbed material underlying the I-80 right-of-way, would not require mitigation. Monitoring would not need to be conducted in sediments that have been previously disturbed or in areas where exposed sediments would be buried, but not otherwise disturbed. Prior to the start of construction, construction personnel involved with earth-moving activities would be informed that fossils could be discovered during excavating, that these fossils are protected by laws, on the appearance of common fossils, and on proper notification procedures should fossils be discovered. This worker training would be prepared and presented by a qualified professional paleontologist.	Professional Paleontologist/ Contractor	Final Design Phase / Pre-Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Hazardous Waste/Materials									
Measure HAZ-1: During the design phase of the project, a preliminary site investigation would be performed to investigate potential hazardous materials concerns related to soil and groundwater within the project limits, as identified in the ISA. A work plan for the preliminary site investigation would be submitted to Caltrans for review and approval. Additional investigation may be required to fully evaluate potential hazardous materials issues if concerns are identified during the preliminary site investigation. The preliminary site investigation report for the project would be provided to project contractors so that the findings can be incorporated into their Health and Safety and Hazard Communication Programs. The general areas and contaminants of concern for investigating soil and groundwater are summarized further below. Based on the findings and recommendations of the preliminary site investigation, the Build Alternative may need to implement special soil, groundwater, and construction materials management and disposal procedures for hazardous materials, as well as construction worker health and safety measures during construction (see Measures **HAZ-2** through **HAZ-5**). If such implementation occurs, required coordination with the Alameda County Department of Environmental Health (ACDEH) Certified Unified Program Agency (CUPA) would occur. The ACDEH CUPA is the administrative agency that coordinates and enforces numerous local, state, and federal hazardous materials management and environmental protection programs in the county.	Design Engineer	Pre-Construction							
Measure HAZ-2: In accordance with Caltrans protocol, a site safety plan would be prepared and implemented prior to initiation of any construction/development activities to reduce potential health and safety hazards to workers and the public. In accordance with Caltrans' standard special provision related to earth work, the contractor would be notified that lead will be present in the construction area, and would be required to prepare a lead compliance plan to prevent or minimize worker exposure to lead. Caltrans soil sampling requirements for potential reuse of lead-contaminated soil are summarized further below.	Design Engineer	Pre-Construction							
Measure HAZ-3: An asbestos and lead-based paint survey would be conducted by a qualified professional for the bridge structures that are subject to demolition as part of the Build Alternative. All loose and peeling lead-based paint and asbestos-containing material would be removed prior to the demolition of the bridge structure by a certified contractor(s) in accordance with local, state, and federal requirements.	Certified Contractor/ Professional	Pre-Construction/ During Construction							
Measure HAZ-4: Yellow thermoplastic and yellow paint striping and markings on existing roadways would be analyzed for lead chromate prior to disturbance or removal in accordance with Chapter 7 of Caltrans' Construction Manual. Alternatively, yellow stripe and pavement markings may be managed in accordance with Caltrans standard special provision 14-11-07.	Contractor	Pre-Construction/ During Construction							
Measure HAZ-5: Representative soil and/or groundwater sampling would be conducted by a licensed professional to evaluate the potential presence of hazardous materials in soil and groundwater within the project limits prior to construction and earthwork activities. The sampling would be performed in accordance with the work plan that has been reviewed and approved by Caltrans. Soil samples collected would be analyzed for total lead and soluble lead to evaluate potential reuse of lead-affected soils in accordance with the Department of Toxic Substances Control's variance issued to Caltrans. Soil and groundwater analytical results would be screened against the San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels to determine appropriate actions that would ensure the protection of construction workers, future site users, and the environment, and also be screened against hazardous waste thresholds to determine soil management options. Implementation of the subsurface sampling for the entire Build Alternative alignment is anticipated to cost approximately $375,000. The soil and groundwater sampling would likely be a three-month endeavor, assuming property access and approval of the work plan is obtained in a timely fashion.	Certified Contractor/ Professional	Pre-Construction/ During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Air Quality									
Measure AIR-1: Construction period to air quality effects are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control will reduce any air quality impacts resulting from construction activities: • The construction contractor must comply with Caltrans' Standard Specifications in Section 14-9 (2010). Section 14-9-02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. Section 14-9.03 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are described in Section 18.	Contractor	During Construction							
Measure AIR-2: Water or dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a "no visible dust" criterion either at the point of emissions or at the right-of-way line depending on local regulations.	Contractor	During Construction							
Measure AIR-3: Measures to reduce PM10, PM2.5 and diesel particulate matter from construction would be incorporated to the extent feasible to ensure that short-term health impacts to nearby sensitive receptors are avoided. These include: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power' sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. At a minimum, all equipment should meet the current CARB fleet standards. • Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.	Contractor	During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Noise									
Mitigation Measure NOI -A: Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of the following noise barriers: • Barrier SW11, along the north side of Davis Street/Hickory Lane on-ramp to westbound I-80, with a respective length and height of 280 feet and 10 feet. Calculations based on preliminary design data show that the barrier will reduce noise levels by 7 dBA for 5 residences at a cost of $136,100. • Barrier SW12a, along the eastbound I-80 edge of shoulder, in front of the Sunset Circle Mobile Homes Complex, with a respective length and height of 1,960 feet and 14 feet. Calculations based on preliminary design data show that the barrier will reduce noise levels by 5 to 10 dBA for 28 residences at a cost of $1,194,900. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made upon completion of the project design and the public involvement processes.	Caltrans	Final Design Phase							
Measure NOI-1: To reduce the potential for noise impacts resulting from construction activities, the following measures would be implemented during construction: • Require all construction equipment to conform to Section 14-8.02, Noise Control, of the latest Standard Specifications. Section 14-8.02 states that construction noise shall not exceed an Lmax of 86 dBA at 50 feet from job site activities between the hours of 9 p.m. to 6 a.m. • Noise-generating construction activities outside of the typical daytime hours of 7:00 a.m. to 7:00 p.m., will require contractor(s) to implement a construction noise monitoring program and, if feasible, provide additional avoidance measures as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors. • Pile driving activities would be limited to daytime hours only, where feasible. The contractor(s) would be required to equip all internal combustion engine equipment with intake and exhaust mufflers that are in good condition and appropriate for the machines. • Unnecessary idling of internal combustion engines within 100 feet of residences would be strictly prohibited. • The contractor(s) would be required to locate stationary noise generating equipment as far as possible from sensitive receptors. • The contractor(s) would be required to utilize "quiet" air compressors and other "quiet" equipment, where such technology exists. • The contractor(s) would prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise-sensitive receptors. The construction plan would also list the construction noise reduction measures listed above, as applicable.	Contractor	During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Natural Communities									
Mitigation Measure BIO-A: Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.	Caltrans	Final Design Phase							
Mitigation Measure BIO-B: . Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items: • Habitat impacts summary and proposed habitat mitigation actions • Goals of the restoration to achieve no net loss • The location of the mitigation sites and existing site conditions • Mitigation design including: • Proposed site construction schedule • Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability • Site preparation and grading plan • Invasive species eradication plan, if applicable • Soil amendments and other site preparation • Planting plan (plant procurement/propagation/installation) • Maintenance plan • Monitoring measures, performance and success criteria • Monitoring methods, duration, and schedule • Contingency measures and remedial actions • Reporting measures This mitigation will be deemed complete and Caltrans released from further responsibilities when the final success criteria have been met as determined by applicable regulatory/resource agencies.	Caltrans	Permitting Phase							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Wetlands and other Waters of the U.S.									
Mitigation Measure BIO-C: Compensation for permanent impacts on up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite. These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acres of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.	Caltrans	Final Design Phase							
Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement. Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite . These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.	Caltrans	Final Design Phase							
Animal Species									
Mitigation Measure BIO-E: Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.	Caltrans	Pre-Construction							
Threatened and Endangered Species									
Mitigation Measure BIO-F: Compensatory Mitigation for the California Red-Legged Frog. Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 2:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.02 acres of habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference: • Establishment of a conservation easement for habitat used for California red-legged frog dispersal. • Purchase of USFWS-approved banking credits for upland dispersal habitat. • Provide funds to conservation group for aid and support of California red-legged frog conservation.	Caltrans	Final Design Phase							
Biological Measures Incorporated into the Project Design									
Measure BIO-1: Orange construction barrier fencing will be installed to identify ESAs, including oak and riparian woodlands, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and be removed after completion of construction.	Contractor/ Biologist	Final Design Phase/ Pre-Construction/ During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Measure BIO-2: The following Caltrans standard BMP's shall be implemented during construction to avoid or minimize impacts on aquatic habitats: • All work within the banks of an active channel will be restricted to the dry season (June 1–October 15). • Orange construction barrier fencing will be installed to identify environmentally sensitive areas (ESAs), including aquatic and wetland habitat, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. • Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed only after completion of construction. • Caltrans will implement BMPs as recommended or required by the State Water Quality Control Board to protect water quality. These measures will include, but are not limited to the following: • No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material will be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the U.S./State or aquatic habitat. • No equipment will be operated in the live stream channel. • Equipment staging and parking areas will occur within established access areas in upland habitat above the top of bank. • Machinery or vehicle refueling, washing, and maintenance will occur at least 60 feet from the top-of-bank. Equipment will be regularly maintained to prevent fluid leaks. Any leaks will be captured in containers until the equipment is moved to a repair location. • A spill prevention and response plan will be prepared prior to construction and will be implemented immediately for cleanup of fluid or hazardous materials spills. • Standard erosion control and slope stabilization measures will be required for work performed in any area where erosion could lead to sedimentation of a water body. • Caltrans will provide a dewatering and diversion plan for agency approval as needed.	Caltrans/ Contractor	During Construction							
Measure BIO-3. A Worker Environmental Awareness Training (WEAT) program will be given by a qualified biologist before the onset of to explain to construction personnel how best to avoid the accidental take of steelhead and Chinook salmon and the valley elderberry longhorn beetle. The biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.	Caltrans/ Contractor	Pre-Construction							
Measure BIO-4. All work within a low-flow channel associated with the construction of the Ulatis and Horse creek bridge modifications will occur during the dry season (June 1to October 15). During this time, drainage flows in Ulatis and Horse creeks are expected to be at annual lows, and it is possible that the drainages may be completely dry; during this time, steelhead and Chinook are expected to be absent from the reaches of Ulatis and Horse creeks within the BSA.	Caltrans/ Contractor	During Construction							
Measure BIO-5. When work in a flowing stream is unavoidable and before work commences, any stream flow will be diverted around the work area by a barrier/cofferdam, temporary culvert, or a new channel capable of permitting upstream and downstream fish movement. The material used to construct the cofferdams will be clean material, contained, for example in sacks, and placed over plastic or filter fabric (or like material) so it can be completely removed from the streambed and preserve existing riverbed substrate. Construction of the barrier/cofferdam or the new channel will normally begin in the downstream area and continue in an upstream direction and the flow will be diverted only when construction of the diversion is completed.	Caltrans/ Contractor	During Construction							
Measure BIO-6. During construction activities that involve physical modification of any bridge over aquatic habitat, netting or other structures will be installed under the existing bridge to prevent debris from entering the channel, as such debris could degrade water quality downstream and potentially injure steelhead or Chinook salmon (e.g., when work on the bridge deck is occurring during the wet season).	Caltrans/ Contractor	During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Measure BIO-7. If flow is present in the drainage when in-water construction is scheduled to occur, a qualified biologist will be present to monitor all activities involving the placement of fill in the drainage, including any cofferdam construction. The biologist will inspect the area where the cofferdam will be constructed prior to construction and will ensure that any fish have vacated the cofferdam area before in-water work begins. A water diversion plan will be developed and submitted to resource agencies prior to construction start. Once all fish have moved out of the work area, the cofferdam will be completed so that fish cannot re-enter this area.	Contractor/ Biologist	During Construction							
Measure BIO-8. If at any time an individual steelhead or Chinook salmon appears to be at risk of injury or mortality due to project-related activities, all work will stop until Caltrans has consulted with NMFS to determine a means of avoiding impacts on the individual(s).	Caltrans	During Construction							
Measure BIO-9. In order to avoid and minimize project impacts on badgers, a qualified mammalogist will conduct pre-construction surveys for badger dens non-native annual grassland throughout the BSA, within two weeks prior to groundbreaking. Because badger dens, if present, are most likely to occur in open grassland and ruderal habitats, this survey could be conducted in conjunction with the preconstruction survey for burrowing owls.	Caltrans/ Mammalogist	Pre-Construction							
Measure BIO-10. If an active badger maternity den is located, the mammalogist will determine the size of a construction-free buffer that will be maintained around the den to avoid impacts on the den during the pupping season (i.e., February 15 through July 1, or as otherwise determined through surveys and monitoring of the den), in consultation with the CDFW.	Contractor/ Mammalogist	During Construction							
Measure BIO-11. If an active den is found outside of the pupping season, the badger will be evicted by excavation of the den using hand tools, in consultation with the CDFW and under the supervision of a qualified biologist. These precautionary measures will ensure that no active pupping dens are impacted by the project.	Contractor/ Biologist	During Construction							
Measure BIO-12. A qualified biologist will conduct a pre-construction survey for western pond turtles and their nests. If a western pond turtle is found in an area where it could be injured or killed by project activities, the qualified biologist will relocate the turtle to an appropriate site outside the project area.	Caltrans/ Biologist	Pre-Construction							
Measure BIO-13. If an active western pond turtle nest is detected within the activity area, a 25-foot buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist.	Contractor/ Biologist	During Construction							
Measure BIO-14. Following the initial survey, a qualified biologist will conduct a survey of the aquatic habitat within the activity area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity will immediately cease, and a qualified biologist will be contacted. Work within the area will not resume until the turtle has been relocated or has moved out of the area where it could be impacted.	Caltrans/ Biologist	Pre-Construction							
Measure BIO-15. Work within 100 feet of bridges/crossings identified in Table 9 of Caltrans 2014i as providing suitable bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) will be avoided during the maternity season (April 1 through July 31) to the extent feasible. Outside of the maternity season, when construction activities will occur within 100 feet of the roost, the bats may be habituated enough to noise and vibration that they may tolerate the work activities and not abandon the roost. Those bats that cannot tolerate this disturbance are expected to leave the roost, dispersing to other roost habitat in the vicinity (e.g., other bridges). However, based on the bats' obvious habituation to noise and vibrations associated with existing traffic, impacts on the colony will be lower if the bats are allowed to decide whether to abandon based on their own level of tolerance than if the bats are evicted prior to work, which is assured of causing the abandonment of the entire colony. As a result, no eviction of bats is proposed for work conducted outside of the maternity season. Performing work outside of the maternity season will ensure that no non-flying young are abandoned or harmed during work activities. Further, in case the bats do disperse from the bridge when work commences, all work activities involving jackhammering within 100 feet of the roost will commence in the evening, after sunset, in order to minimize the risk of predation of bats leaving the roost. If work within 100 feet of potential day roosts sites during the maternity season cannot be avoided, the following measures will be implemented.	Contractor	During Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Measure BIO-16. If jackhammering or other ground-disturbing activities will occur on the freeway immediately above a potential day roost, bats will be safely evicted from the potential roost site under the direction of a qualified bat biologist. Eviction activities will be performed prior to the breeding season (i.e. April 1) in the year in which project activities are scheduled to occur. Eviction of bats will occur at night to decrease the likelihood of predation (compared to eviction during the day). Evictions will occur between September 1and March 32, outside the maternity season, but will not occur during long periods of inclement or cold weather (as determined by the bat biologist) when prey are not available or bats are in torpor. Following eviction, bat exclusion devices will be installed to prevent bats from taking up occupancy of the structure prior to the onset of the proposed activity.	Contrractor/ Biologist	During Construction							
Measure BIO-17. If jackhammering or other ground-disturbing activities will not occur on the freeway immediately above the roost but will occur within 100 feet of the roost, a qualified bat biologist will determine whether the bats will be evicted, using the methods outlined in **BIO-15** and **BIO-16**, on a case-by-case basis depending on the level of disturbance that is proposed.	Contractor/ Bat Biologist	During Construction							
Measure BIO-18. Pre-construction surveys for burrowing owls will be conducted in potential habitat in conformance with the CDFW's 2012 protocol (CDFW 2012).	Biologist	Pre-Construction							
Measure BIO-19. If burrowing owls are present during the nonbreeding season, (generally 1 September 1to January 31), the approved biologist will establish a protective buffer zone in coordination with resource agencies. During the breeding season (generally 1 February 1 to August 31), a 250-foot buffer, within which no new project-related activities will be permissible, will be maintained between project activities and occupied nests. Owls present between February 1and August 31 will be assumed to be nesting unless monitoring evidence indicates that the owls are no longer nesting, or the young owls are foraging independently, or only a single owl (rather than a breeding pair) is present after 1 July and there is no evidence that young owls are present, in which case the buffer may be reduced or the owls may be relocated prior to August 31, in consultation with the CDFW.	Caltrans/ Biologist	Pre-Construction							
Measure BIO-20. If construction will directly impact occupied burrows, eviction of owls will occur in coordination with the regulatory agencies.	Caltrans/ Biologist	Pre-Construction							
Measure BIO-21. If vegetation is to be removed by the project, potential nesting substrate (e.g., bushes, trees, snags, grass, and suitable artificial surfaces) that will be disturbed should be removed during the nonbreeding season (i.e., they should be removed between September 1and February 14), if feasible, to help preclude nesting. If it is not feasible to schedule vegetation removal during the nonbreeding season, then pre-construction surveys for nesting birds will be conducted by a qualified biologist to ensure that no nests will be disturbed during project implementation. This survey will be conducted no more than seven days prior to the initiation of construction activities. During this survey, the ornithologist will inspect all trees, shrubs, and other potential nesting habitats in and immediately adjacent to the BSA for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the biologist, in consultation with the CDFW, will determine the extent of a buffer zone to be established around the nest, typically 300 feet for raptors and 50 feet for other birds, to ensure that no nests of species protected by the MBTA or the California Fish and Game Code will be disturbed during project implementation.	Caltrans/ Biologist	Pre-Construction							
Measure BIO-22. Alternatively, nest starts may be removed on a regular basis (e.g., every second or third day), starting in late January or early February, or measures such as exclusion netting may be placed over the existing bridges to prevent active nests (i.e., nests with eggs or young) from becoming established. Netting needs to be installed by an experienced deterrence contractor and be well maintained to prevent entanglement or entrapment of birds.	Deterrence Contractor	During Construction							
Measure BIO-23. Because the entire BSA is already subject to disturbance by vehicles, activities that will be prohibited from occurring within the buffer zone around a nest will be determined on a case-by-case basis. In general, activities prohibited within such a buffer while a nest is active will be limited to new construction-related activities (i.e., activities that were not ongoing when the nest was constructed) involving significantly greater noise, human presence, or vibrations than were present prior to nest initiation.	Contractor	During Construction							
Measure BIO-24. Before any ground-disturbing activity, orange construction barrier fencing will be installed to identify ESAs, including elderberry shrubs, present within the BSA but that are to be avoided (i.e., no ground disturbance activities will occur within 20 feet of the shrub) by project activities. The fencing will be installed at least 20 feet from the driplines of all elderberry shrubs on which direct impacts will be completely avoided. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans.	Biologist	Pre-Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Measure BIO-25. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and be removed after completion of construction.	Caltrans/ Contractor	Pre-Construction/ During Construction							
Measure BIO-26. Any damage to the buffer area during construction will be restored following construction. Restoration will include erosion control and re-vegetation with native plants as appropriate.	Caltrans/ Contractor	During Construction/ Post-Construction							
Measure BIO-27. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.	Contractor	During Construction							
Measure BIO-28. Caltrans will include provisions in the construction bid documents that the contractor will implement a dust control program to limit fugitive dust emissions. The dust control program may include, but not be limited, to the following elements, as appropriate: • Water active construction sites at least twice daily. • Pursuant to California Vehicle Code, Section 23114 (State of California 2004), all trucks hauling soil and other loose material to and from the construction site will be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of load and the trailer). • Exposed stockpiles of soil and other backfill material will be enclosed or covered, and watered twice daily or have soil binders added. • Any topsoil that is removed for the construction operation will be stored on-site in piles not to exceed 4 feet in height. These topsoil piles will be clearly marked and flagged. Topsoil piles that will not be immediately returned to use will be revegetated with a non-persistent erosion control mixture.	Caltrans/ Contractor	Pre-Construction/ During Construction							
Measure BIO-29. Caltrans will submit to the USFWS the name(s) and credentials of biologists who would conduct activities related to the California red-legged frog specified in the following measures: • A WEAT program will be given by an approved biologist before the onset of construction within potential California red-legged frog habitat to explain to construction personnel how best to avoid the accidental take of red-legged frogs. The biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures. • Prior to the initiation of the pre-construction survey, a relocation plan for any California red-legged frogs found on the project site will be submitted to the USFWS for approval. • The approved biologist will perform pre-construction surveys. • A USFWS-approved biologist will be present at all times during initial disturbance of potential red-legged frog habitat to monitor for red-legged frogs. • All construction pipes, culverts, or similar structures that are stored at the site within suitable red-legged frog habitat for one or more overnight periods will be either securely capped prior to storage or thoroughly inspected by the approved biologist or on-site monitor before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a California red-legged frog is discovered inside a pipe, the approved biologist will move the animal to an approved location, as described above. • During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas. • A qualified biologist will permanently remove any individuals of exotic species.	Caltrans	Pre-Construction							

Task and Brief Description	Responsible Branch / Staff	Timing / Phase	NSSP Req.	Action Taken to Comply with Task	Task Completed		Remarks	Environmental Compliance	
Measure BIO-30. If construction-related work is conducted outside the nesting period (February 1 through August 31), potential impacts on active nests of Swainson's hawks will be avoided. If it is not feasible to schedule construction during the nonbreeding season, the following measures will be implemented. • A pre-construction survey for nesting Swainson's hawks within 0.25 miles of the BSA will be conducted within 15 days prior to the initiation of construction activities; this survey will be conducted by a qualified biologist. If an active Swainson's hawk nest is detected, the following measure will be implemented. • To reduce the potential for Swainson's hawks to abandon their nest or territory due to construction disturbance during their reproductive period, if nesting Swainson's hawks are present, a buffer free from new disturbance will be established within a 600-foot radius of the nest. No new project-related activities (i.e., activities that were not already ongoing when the nest was established, or that are of a substantially greater intensity than when the nest was established) will be undertaken within the buffer. In some cases (e.g., if the construction is not visible from the nest site), it is possible that a lesser buffer would be adequate to avoid disturbance of the nesting Swainson's hawks, but such a variance would require approval of the CDFW. In such a case, the biologist and agency personnel will agree on a reduced buffer, and the biologist will monitor the behavior of the nesting birds during the two days immediately prior to the onset of construction activities within 0.25 miles of the nest to establish a behavioral baseline. The biologist will also monitor the behavior of the nesting birds during the first full day of construction activity within 0.25 miles of the nest. The biologist will look for signs of stress such as repeated alarm calls, agitated behavior, or departure of the birds from the nest. If the birds do not show signs of habituation to the new disturbance by resuming their normal nesting activities, work within the vicinity of the nest will stop and the CDFW will be consulted to refine the buffer determination. If the birds continue their normal activities, the biologist will inspect the nest site every one to two days (the frequency determined in consultation with the CDFW) for as long as the nest is active and work is ongoing within the reduced buffer to confirm that the birds are tolerant of the construction activities. Any required buffer will remain in place until young are no longer dependent on the nest, or until the nesting attempt fails (for reasons other than project activities) and it is determined that the birds will not attempt to re-nest. A qualified biologist will determine through direct observation when the nest is no longer in use (e.g., if the young have fledged or the nesting fails for non-project-related reasons). Constant monitoring of the nest is not necessary, but before construction activities occur within the agreed-upon buffer, the biologist must have confirmed that the nest is no longer active.	Biologist	Pre-Construction							
Measure BIO-31. In compliance with the Executive Order on Invasive Species, EO 13112, and guidance from the Federal Highway Administration (FHWA), the landscaping and erosion control included in the project will not use species listed as invasive. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.	Caltrans/ Contractor	Design Phase/ During Construction							
Measure BIO-32: Compliance with the Biological Opinion. Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking. Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions.	Caltrans/ Resident Engineer/ Contractor	Design Phase/ During Construction							

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APPENDIX F

List of Technical Studies

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Appendix F List of Technical Studies

Caltrans. 2014a. I-80 Express Lane Project, Air Quality Technical Report.

Caltrans. 2014b. I-80 Express Lane Project, Archaeological Survey Report.

Caltrans. 2014c. I-80 Express Lane Project, Biological Assessment.

Caltrans. 2014d. I-80 Express Lane Project, Community Impact Assessment. (Original work June, 2014; Revised September, 2014.)

Caltrans. 2014e. I-80 Express Lane Project, Draft Project Report.

Caltrans. 2014f. I-80 Express Lane Project, Historic Property Survey Report.

Caltrans. 2014g. I-80 Express Lane Project, Historical Resources Evaluation Report. (Original work December, 2013; Amended September, 2014.)

Caltrans. 2014h. I-80 Express Lane Project, Hydromodification Report. (Original work December 2013; Amended December, 2014.)

Caltrans. 2014i. I-80 Express Lane Project, Initial Site Assessment.

Caltrans. 2014j. I-80 Express Lane Project, Location Hydraulic Study Report.

Caltrans. 2014k. I-80 Express Lane Project, Natural Environment Study. (Original work January, 2014; Amended September, 201 4.)

Caltrans. 2014l. I-80 Express Lane Project, Noise Abatement Decision Report.

Caltrans. 2014m. I-80 Express Lane Project, Noise Study Report. (Original work January, 2014; Amended September, 2014.)

Caltrans. 2014n. I-80 Express Lane Project, Paleontological Identification and Evaluation Report. (Original work January, 2014; Amended September 2014.)

Caltrans. 2014o. I-80 Express Lane Project, Preliminary Geotechnical Report. (Original work June, 2014; Revised September, 2014.)

Caltrans. 2014p. I-80 Express Lane Project, Storm Water Data Report. (Original work May, 2014; Amended December, 2014.)

Caltrans. 2014q. I-80 Express Lane Project, Traffic Operations Analysis Report.

Caltrans. 2014r. I-80 Express Lane Project, Visual Impact Assessment.

Caltrans. 2014s. I-80 Express Lane Project, Water Quality Assessment Report. (Original work May, 2014; Amended December, 2014.)

Caltrans. 2013. I-80 Express Lane Project, Memorandum: Justification for No PGR for West Segment.

Caltrans. 2006. I-80 HOV Improvement, Preliminary Geotechnical Report.

APPENDIX G

Noise Receptor and Barrier Locations

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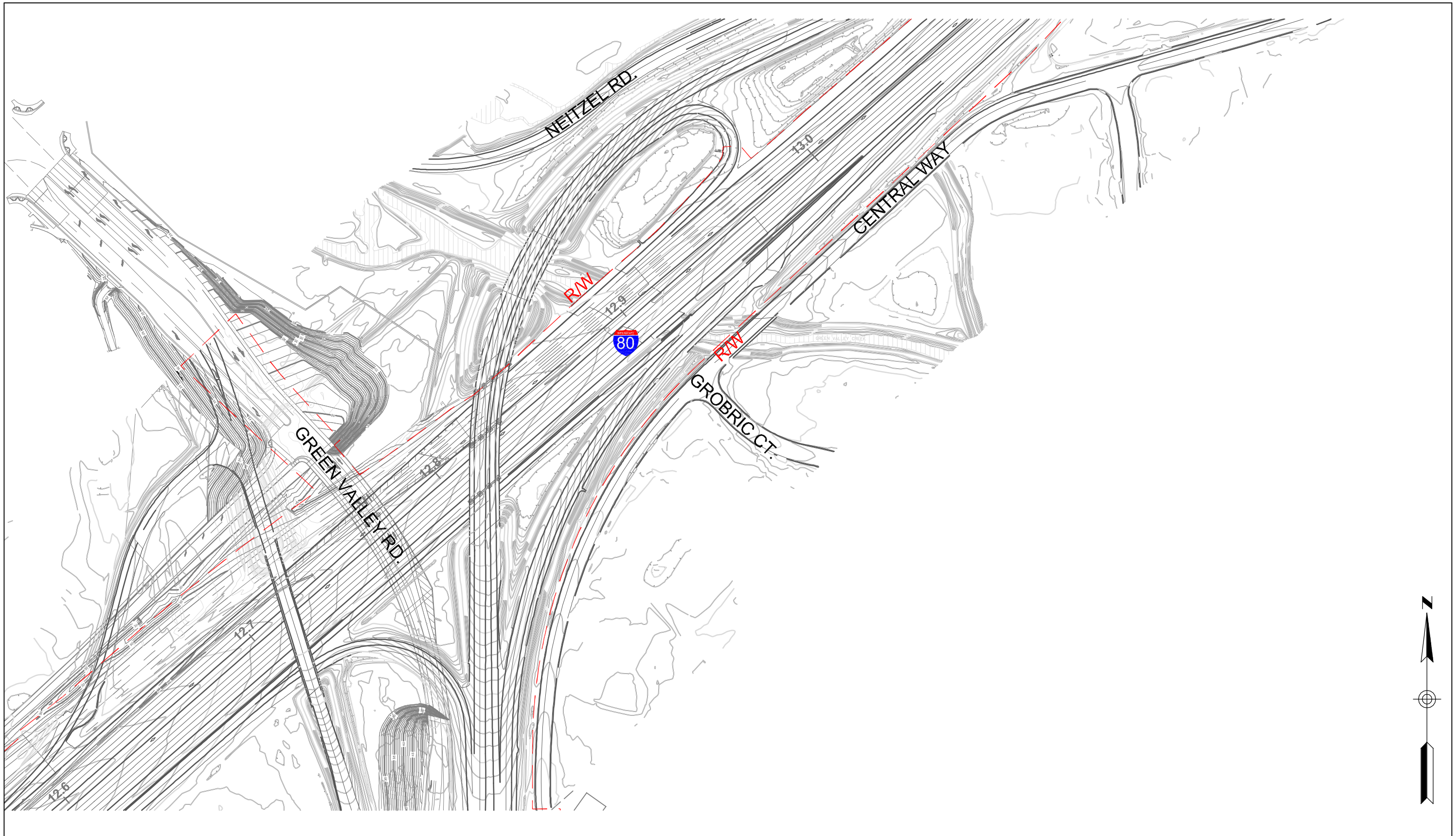


LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

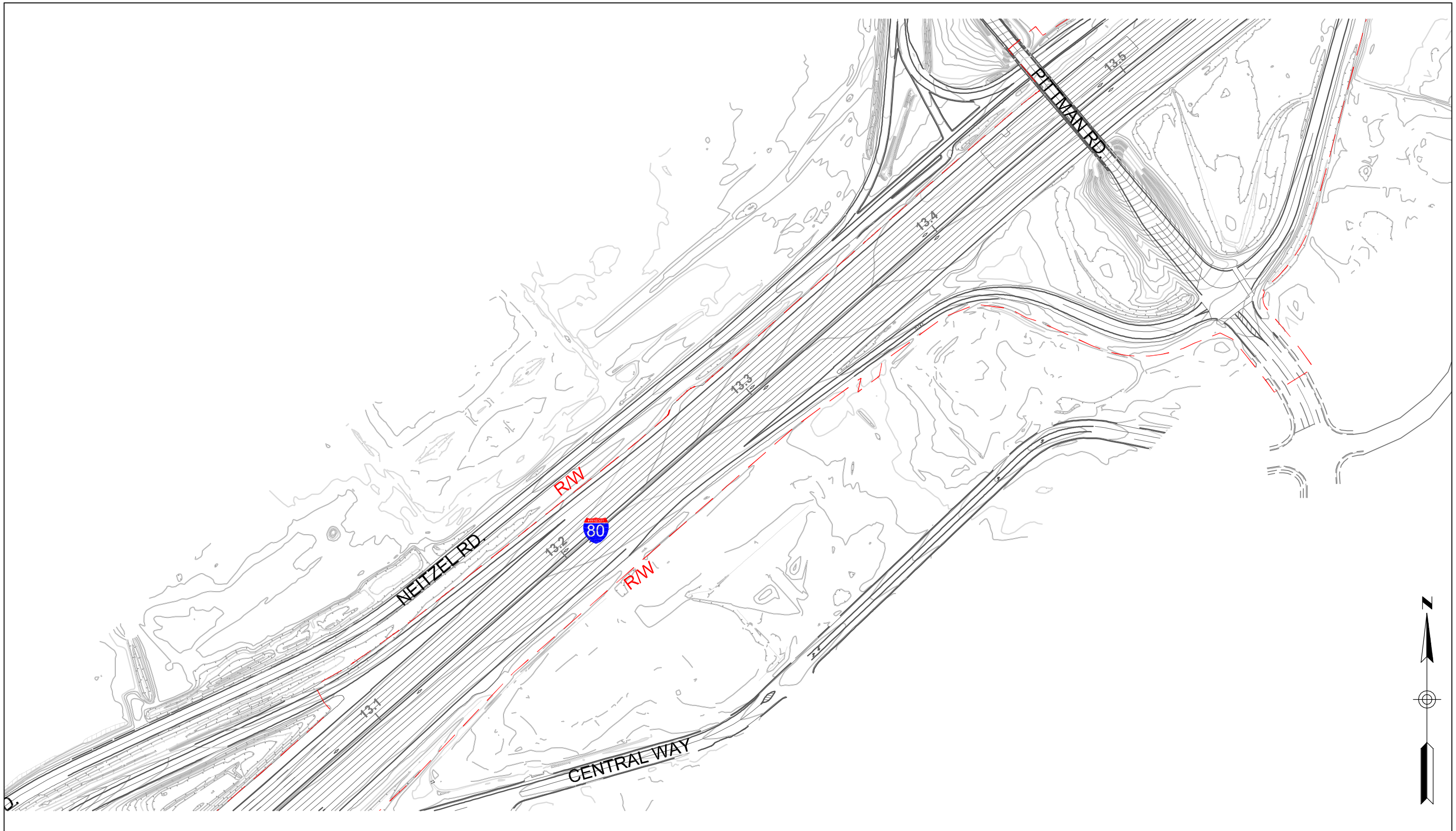
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 1 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

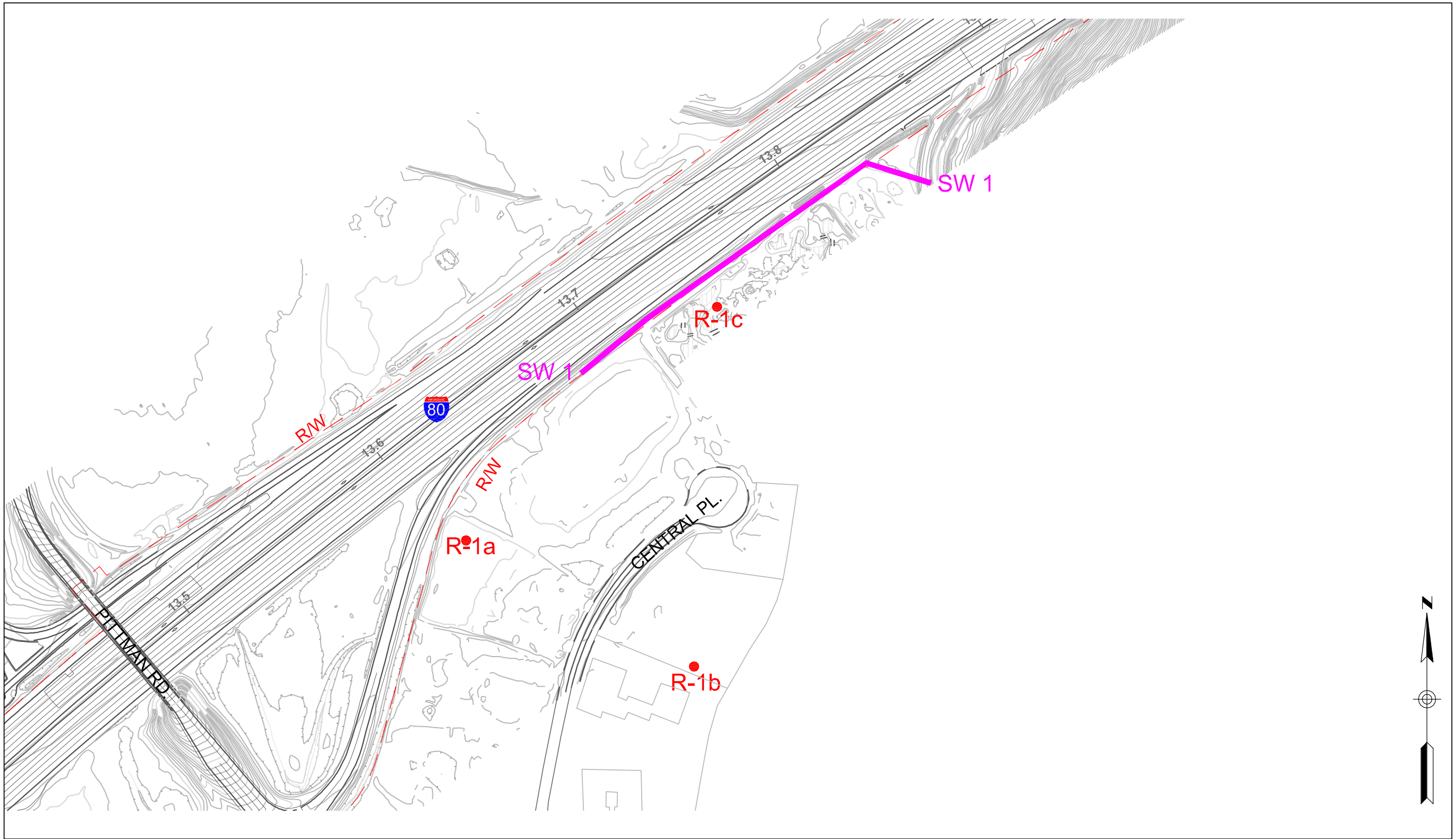
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 2 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

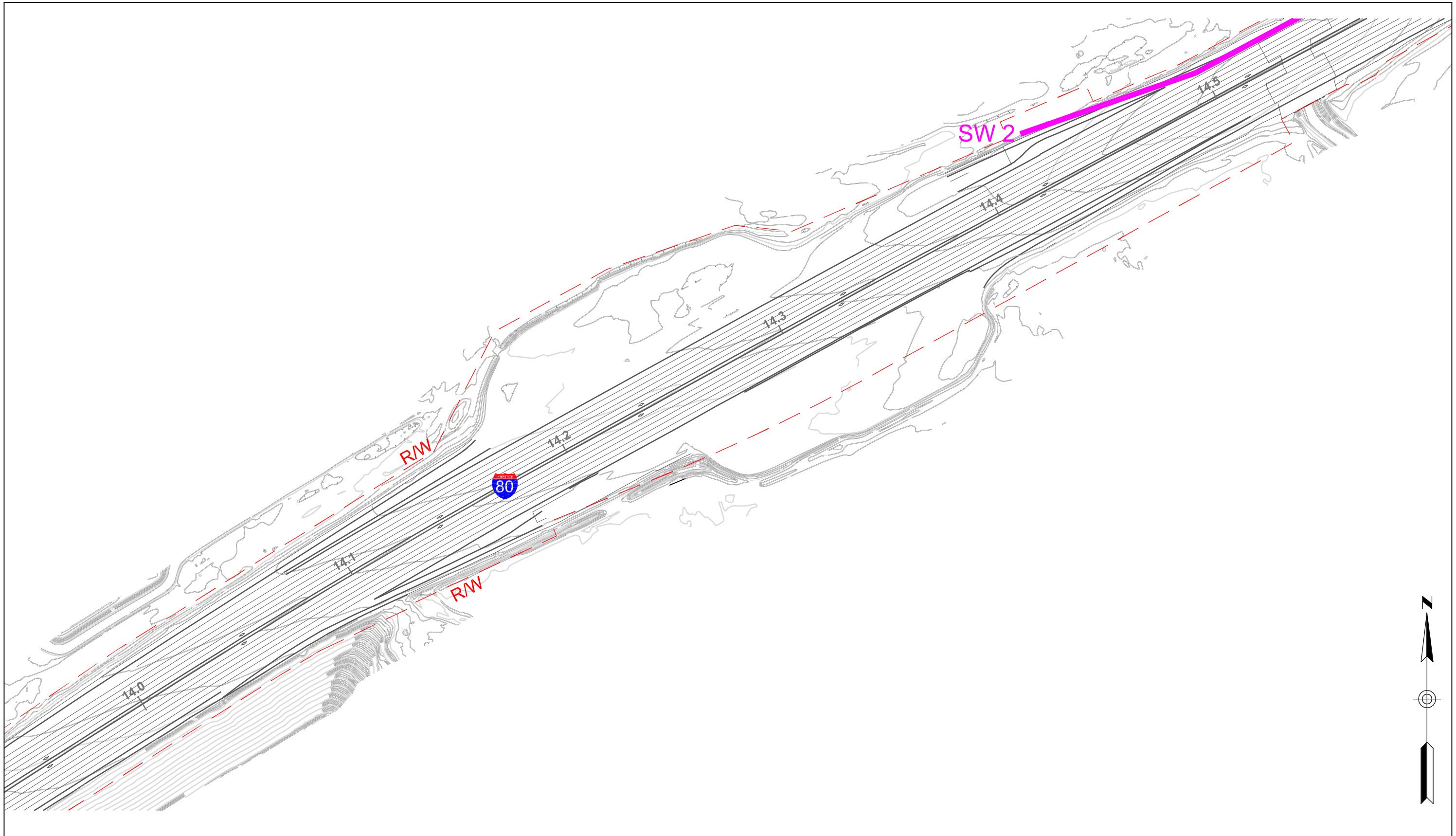
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 3 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

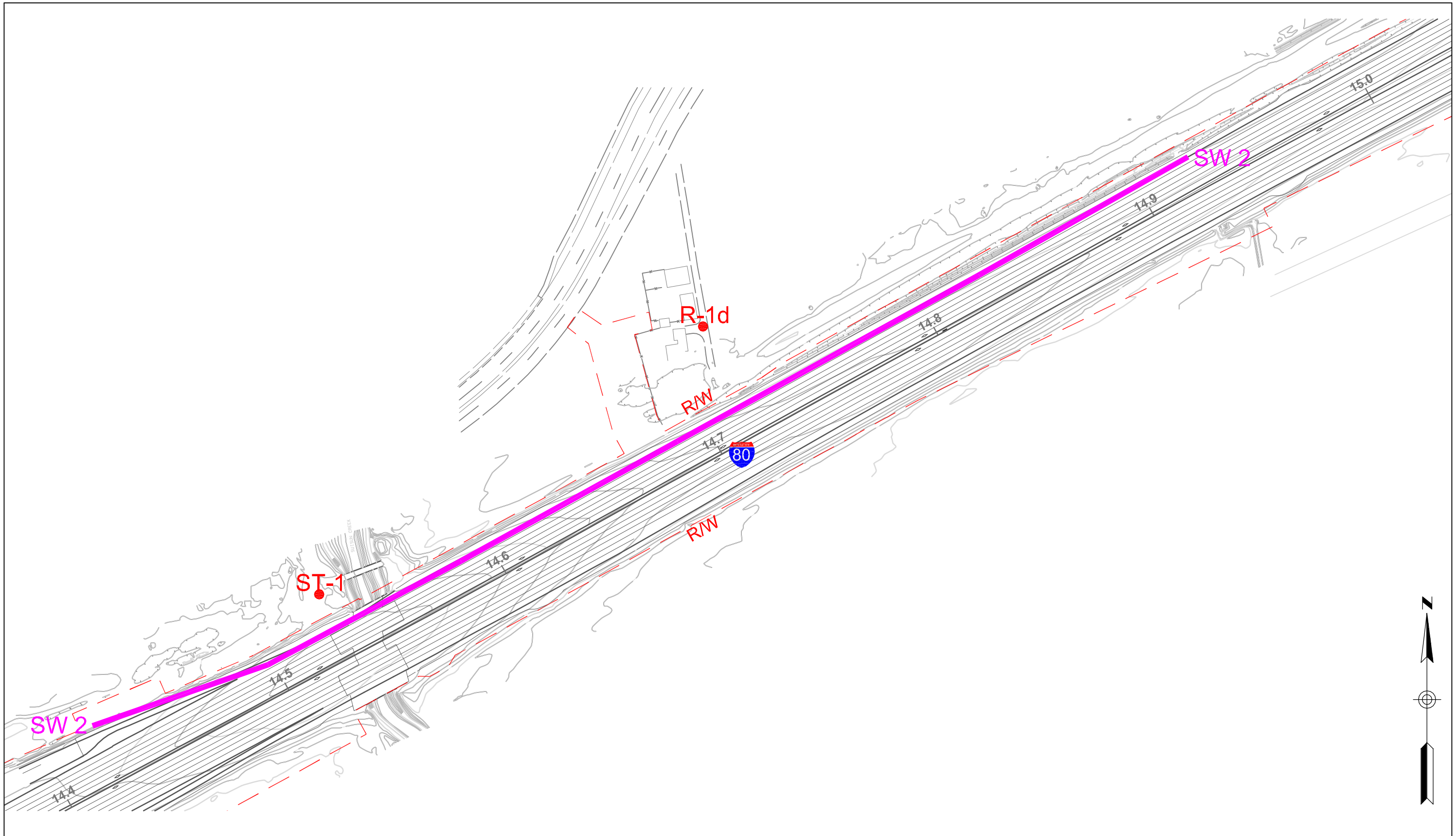
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 4 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 5 OF 41

R-2c

15.5

15.4

15.3

R/W

80

15.2

R-2b

R-2a

R/W

15.1

15.0

N

LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

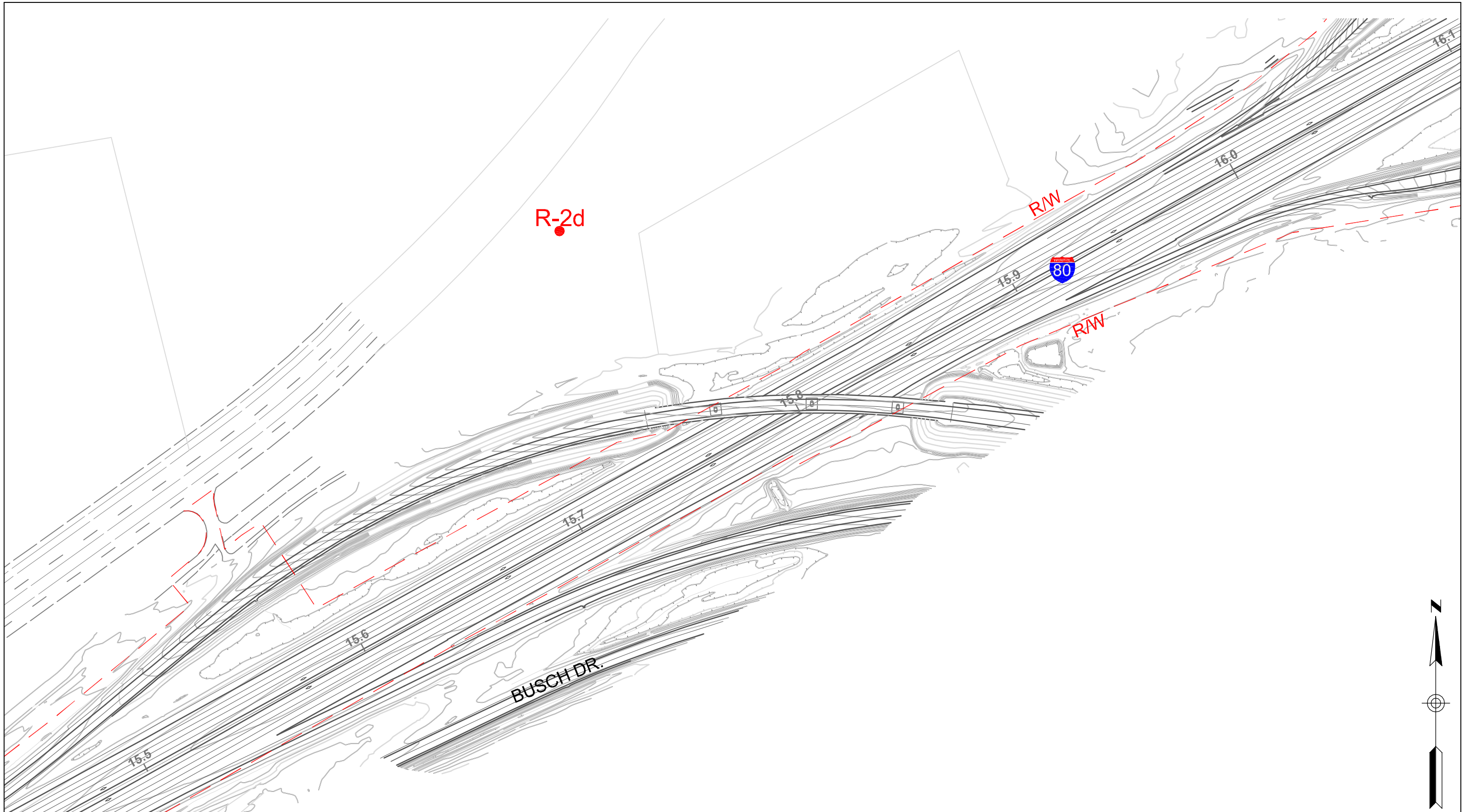
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 6 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

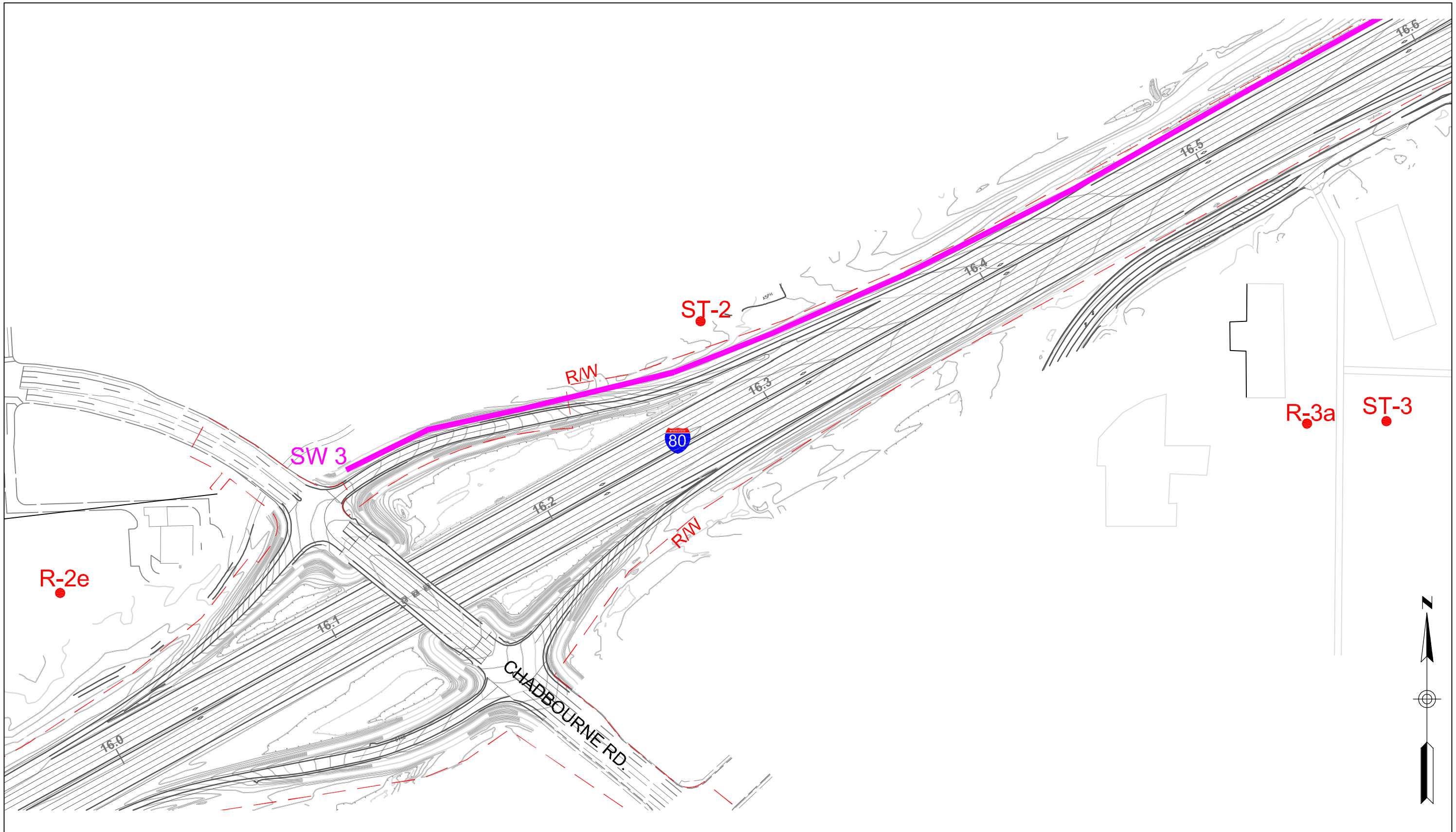
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 7 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 8 OF 41

R-4b

R/W

16.8

16.9

17.0

80

AUTOMALL PKWY.

16.7

R/W

R-4a

R-4e

16.6

ST-4

R-3b

N

LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

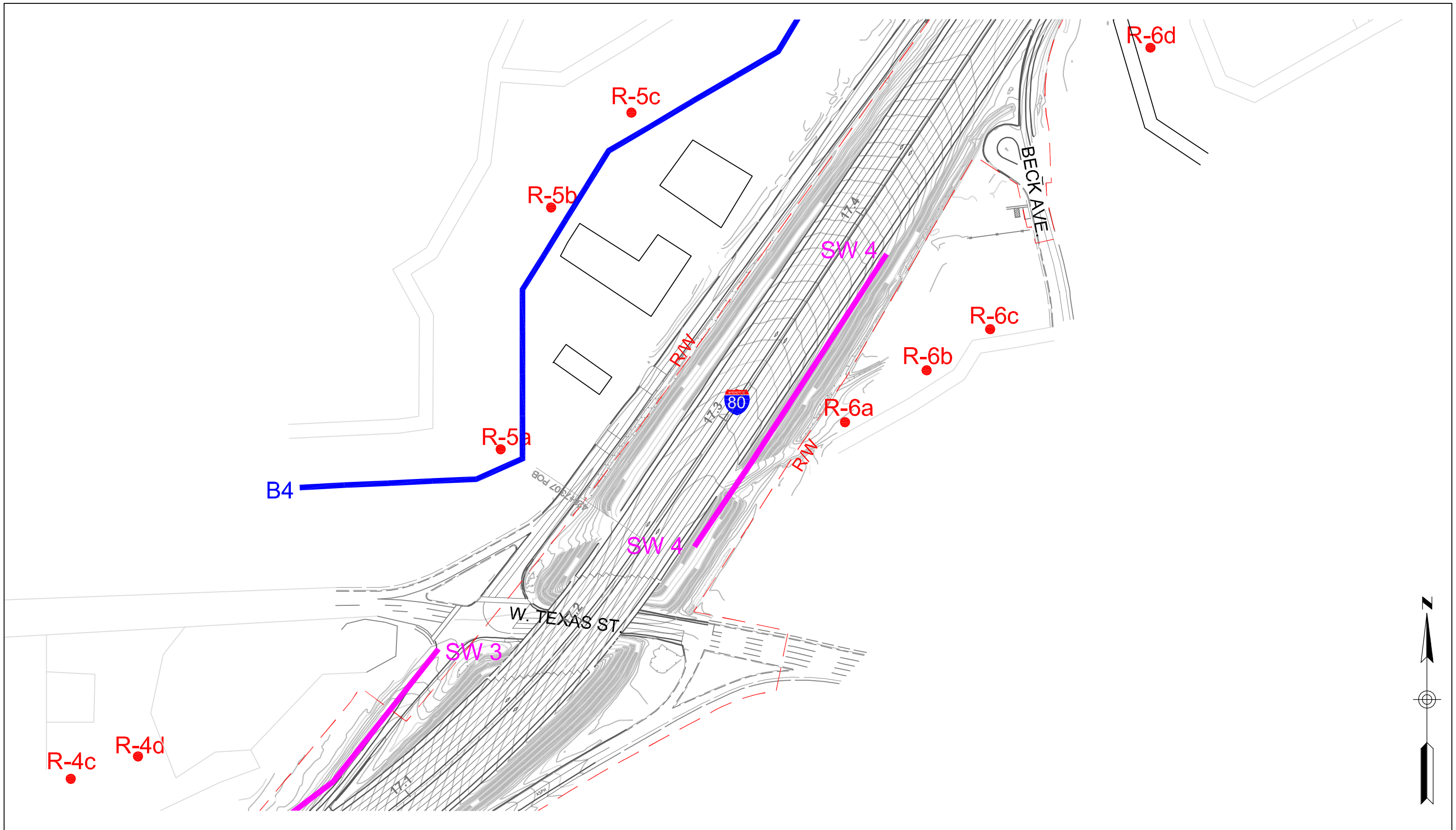
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 9 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

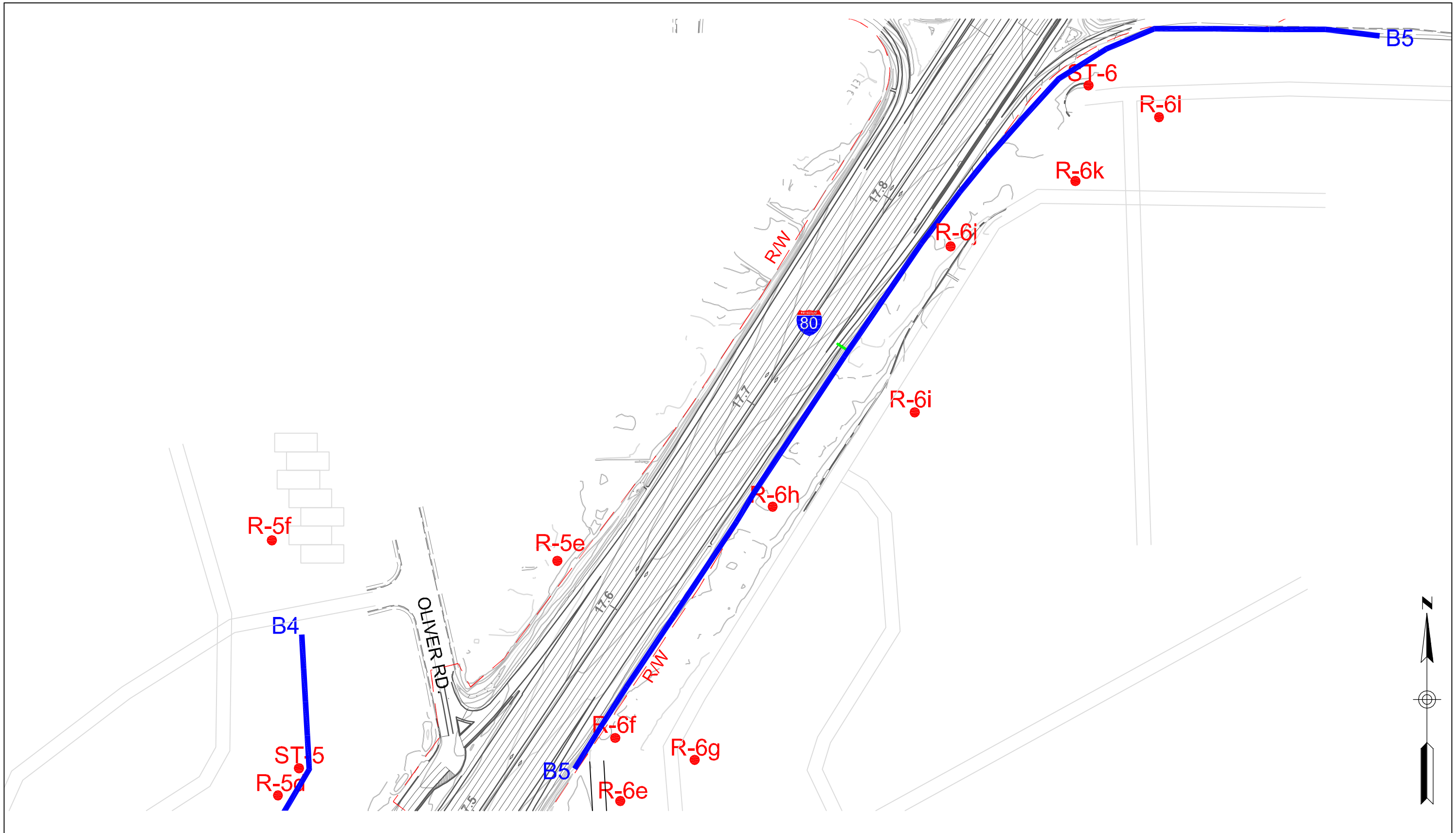
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 10 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

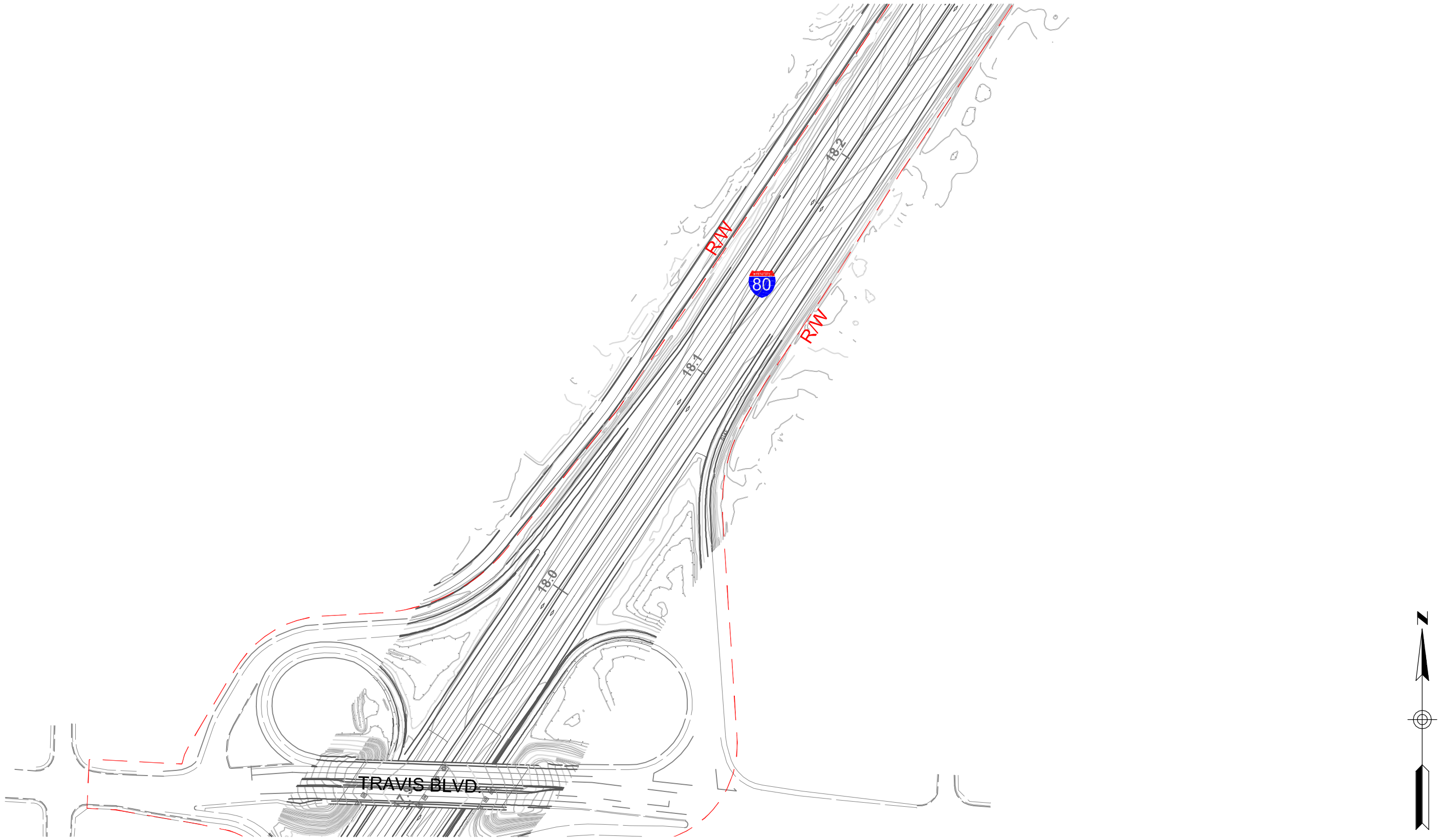
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 11 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

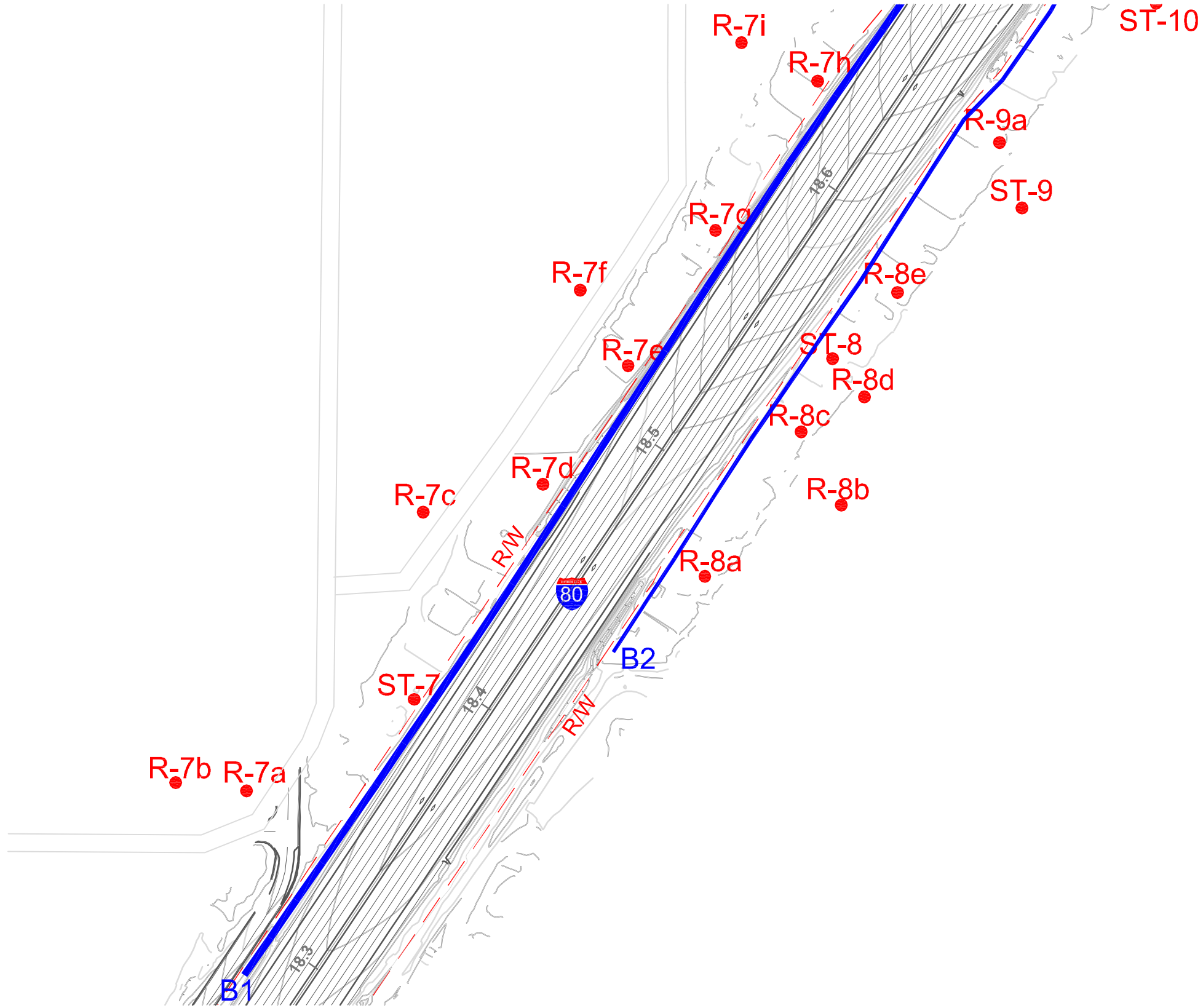
1: 200
FEET

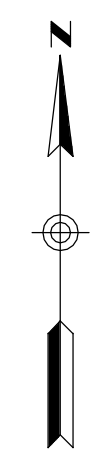
0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 12 OF 41





LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

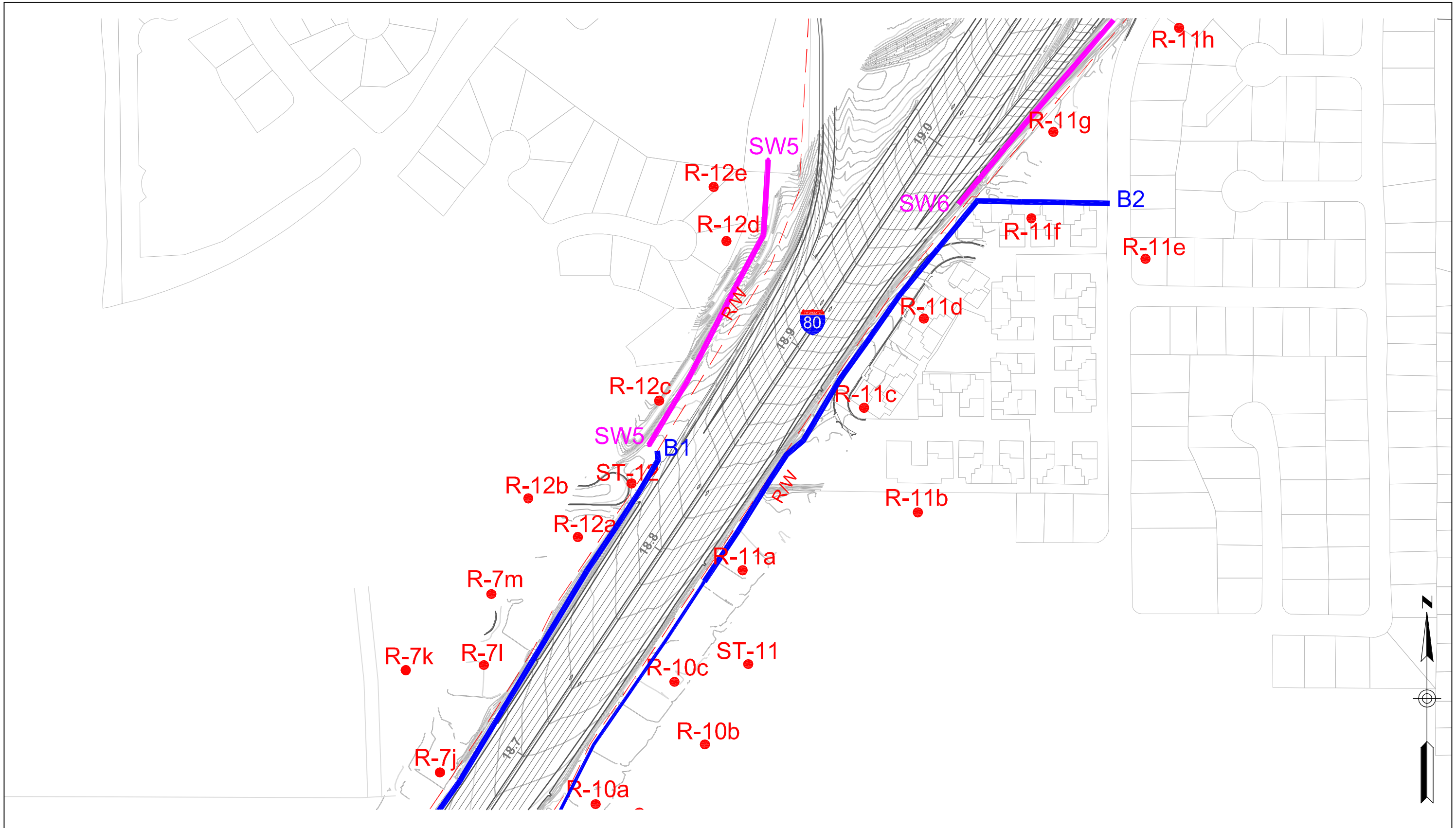
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 13 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

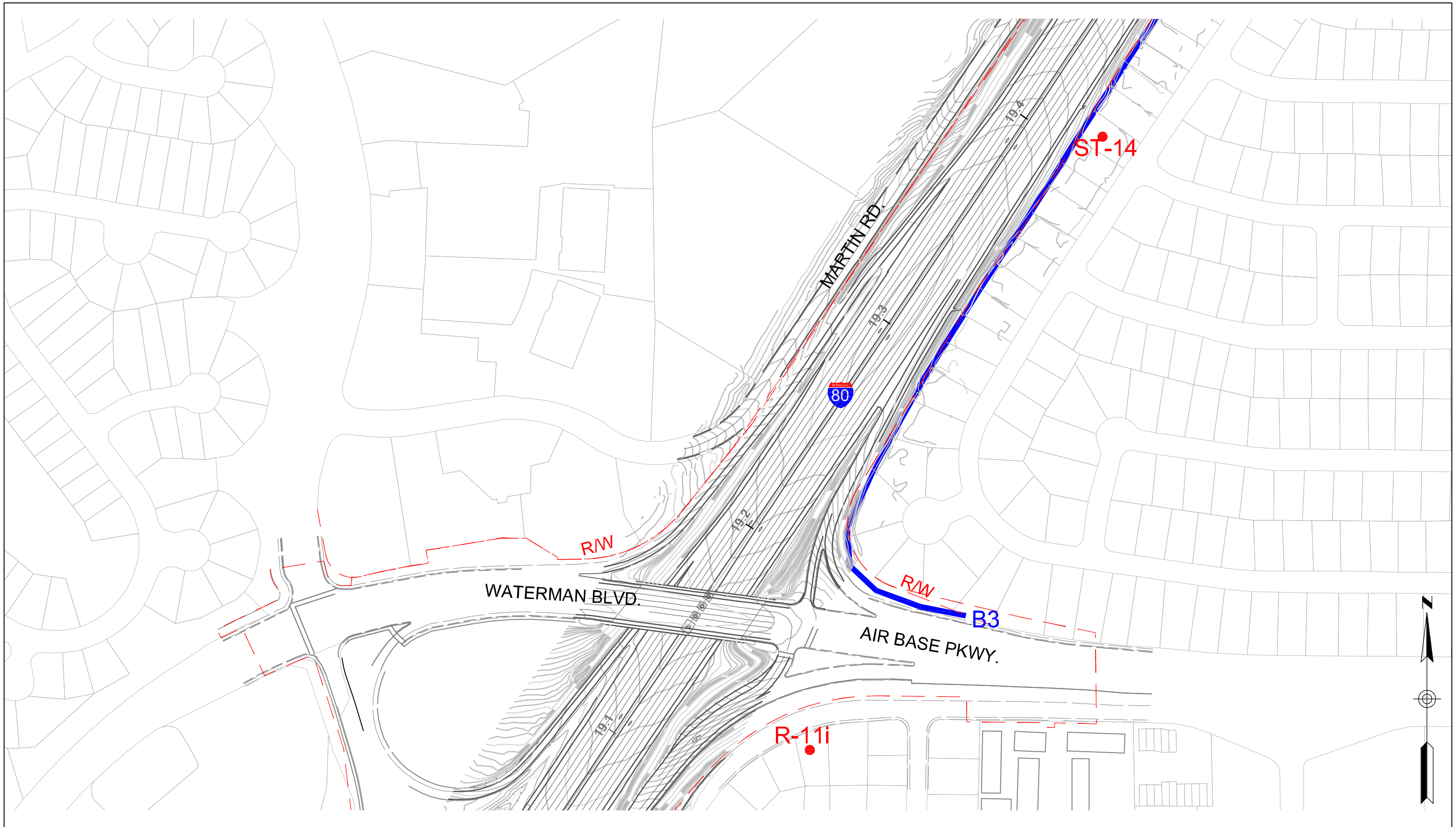
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 14 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

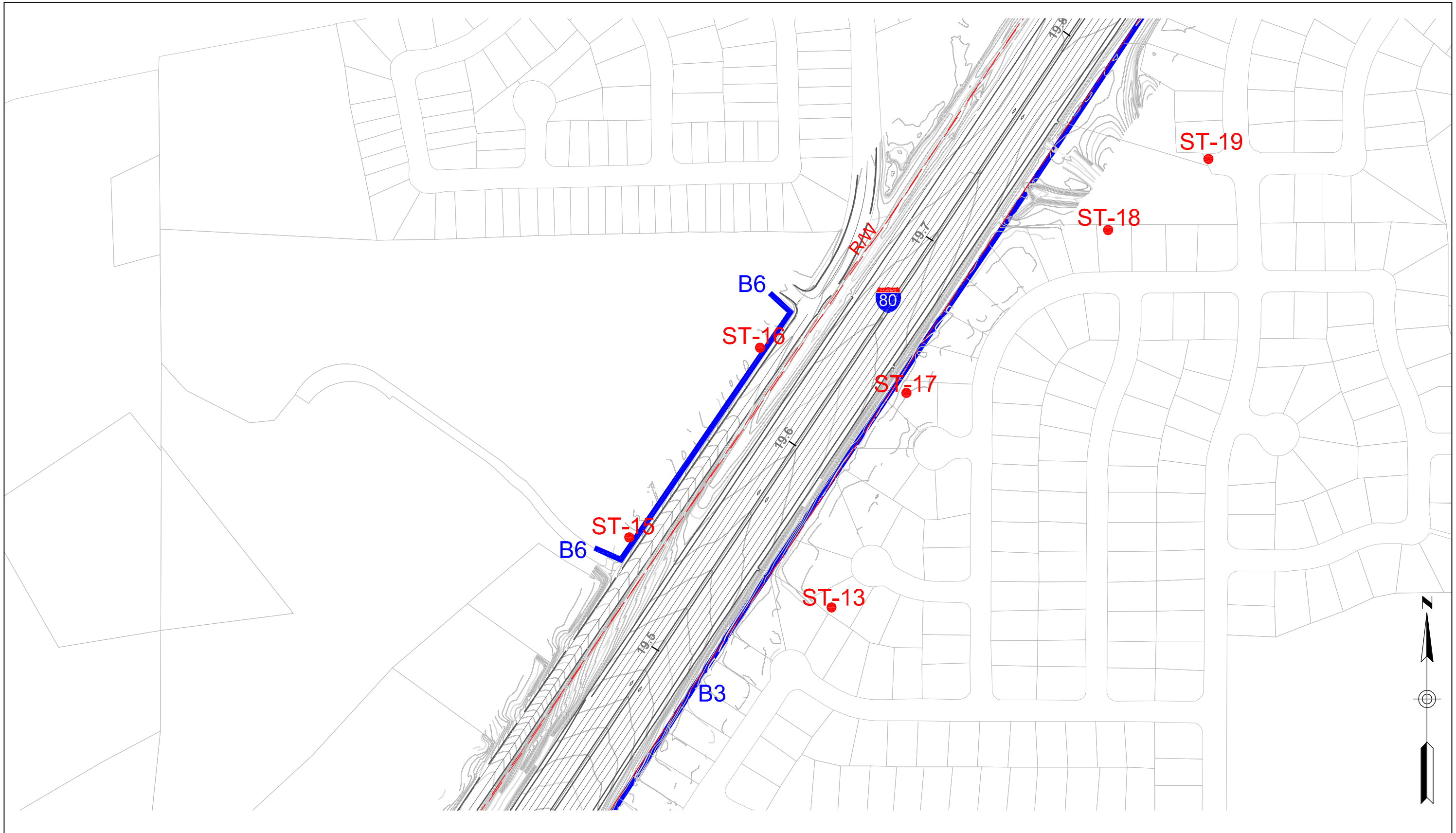
1: 200
FEET

0 FT 200FT 400FT 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 15 OF 41



LEGEND:

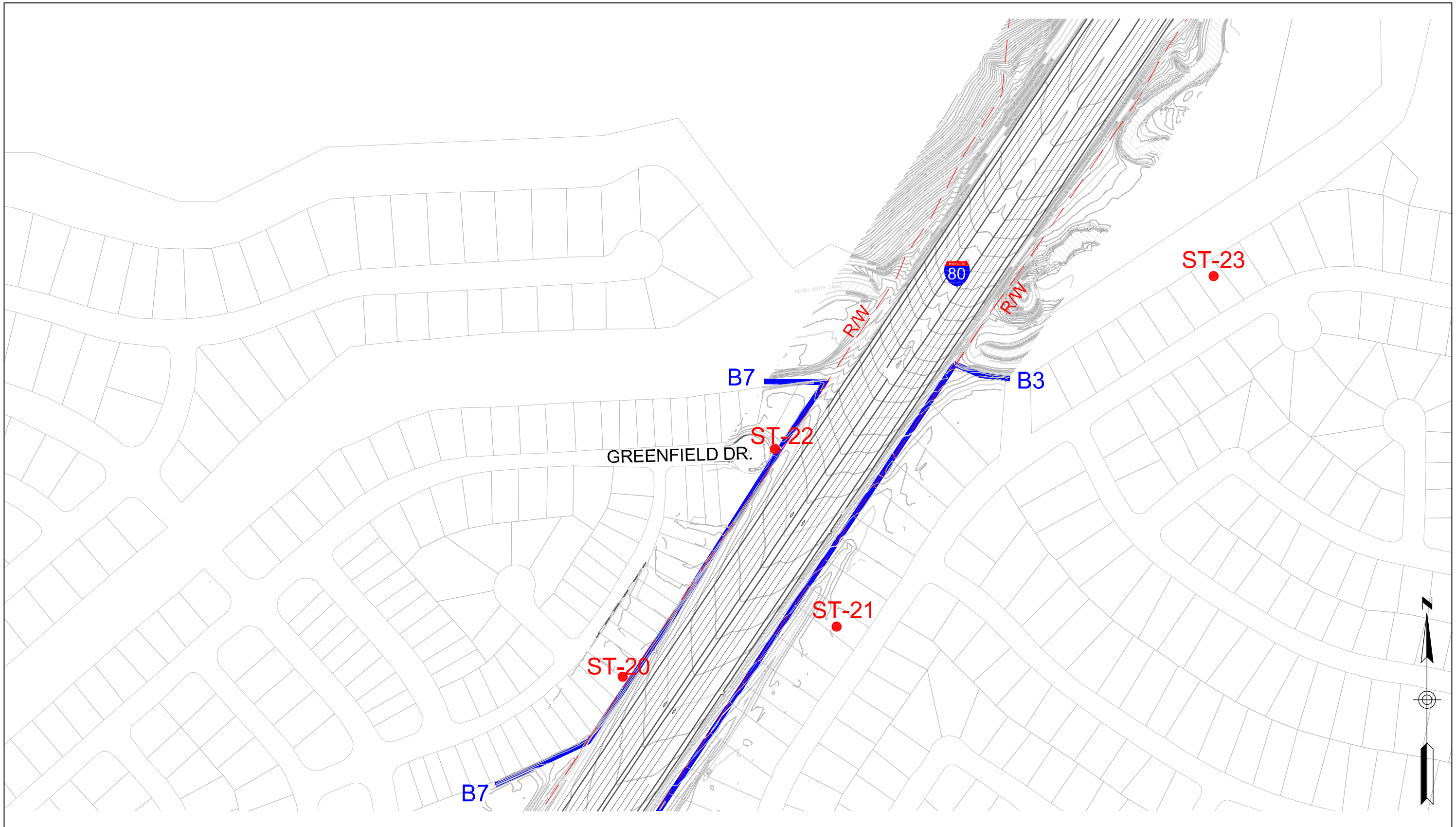
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

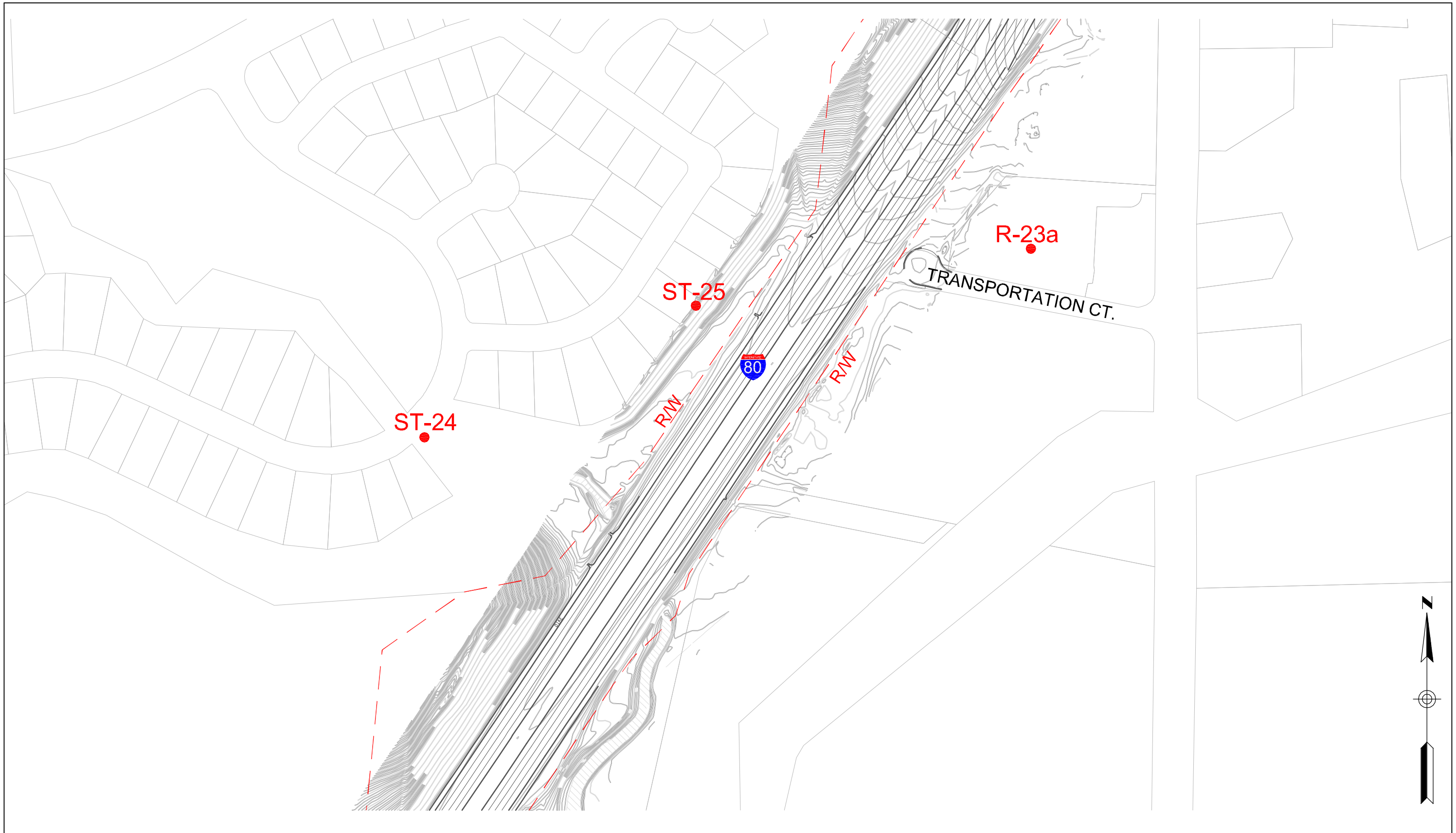
1: 200
FEET

0 FT 200FT 400FT 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 17 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

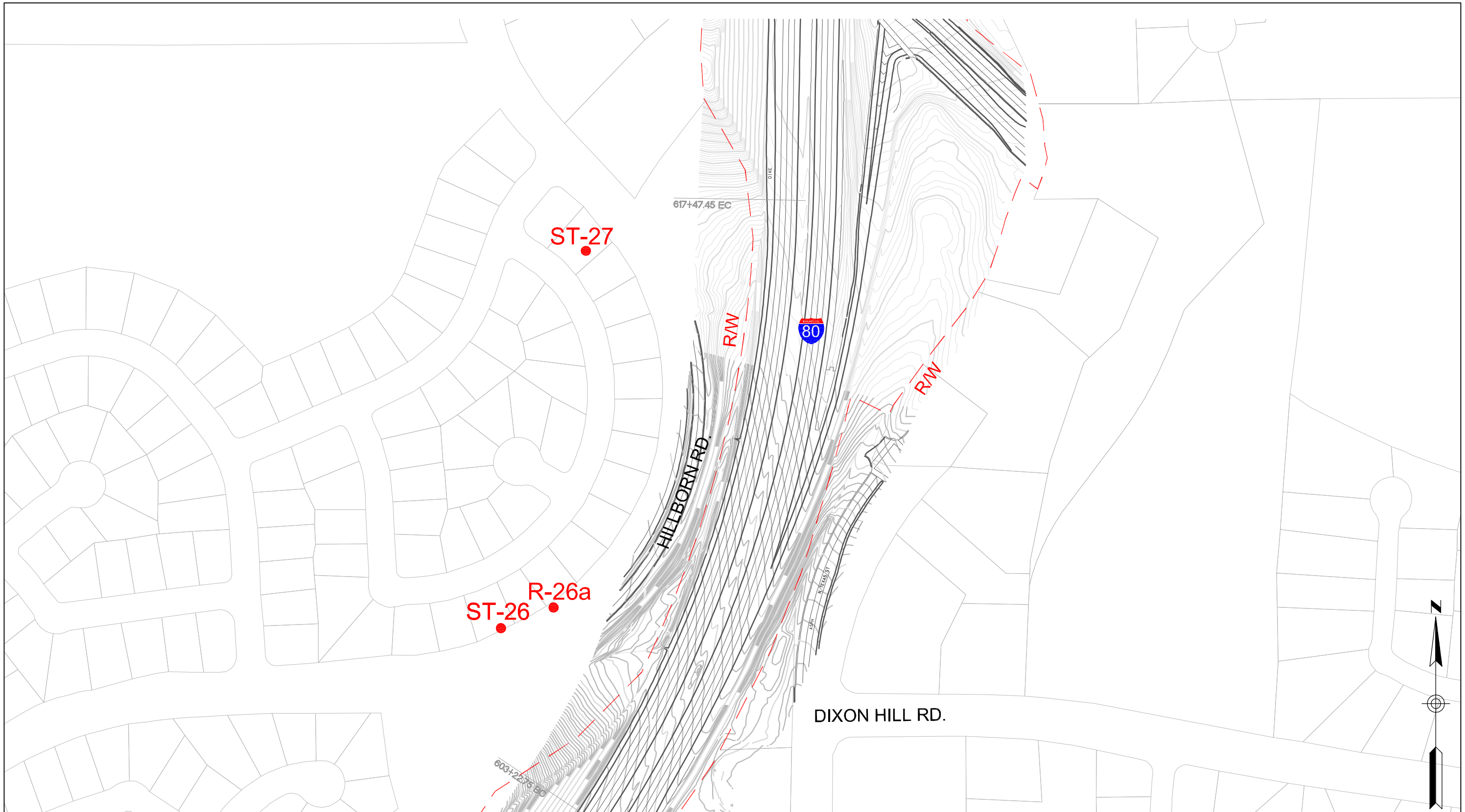
1: 200
FEET

0 FT 200FT 400FT 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 18 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 19 OF 41

ST-33

SW7

MANUEL CAMPOS PKWY

ST-32

ST-31

R/W

80

R/W

ST-30

ST-29

ST-28

N

LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

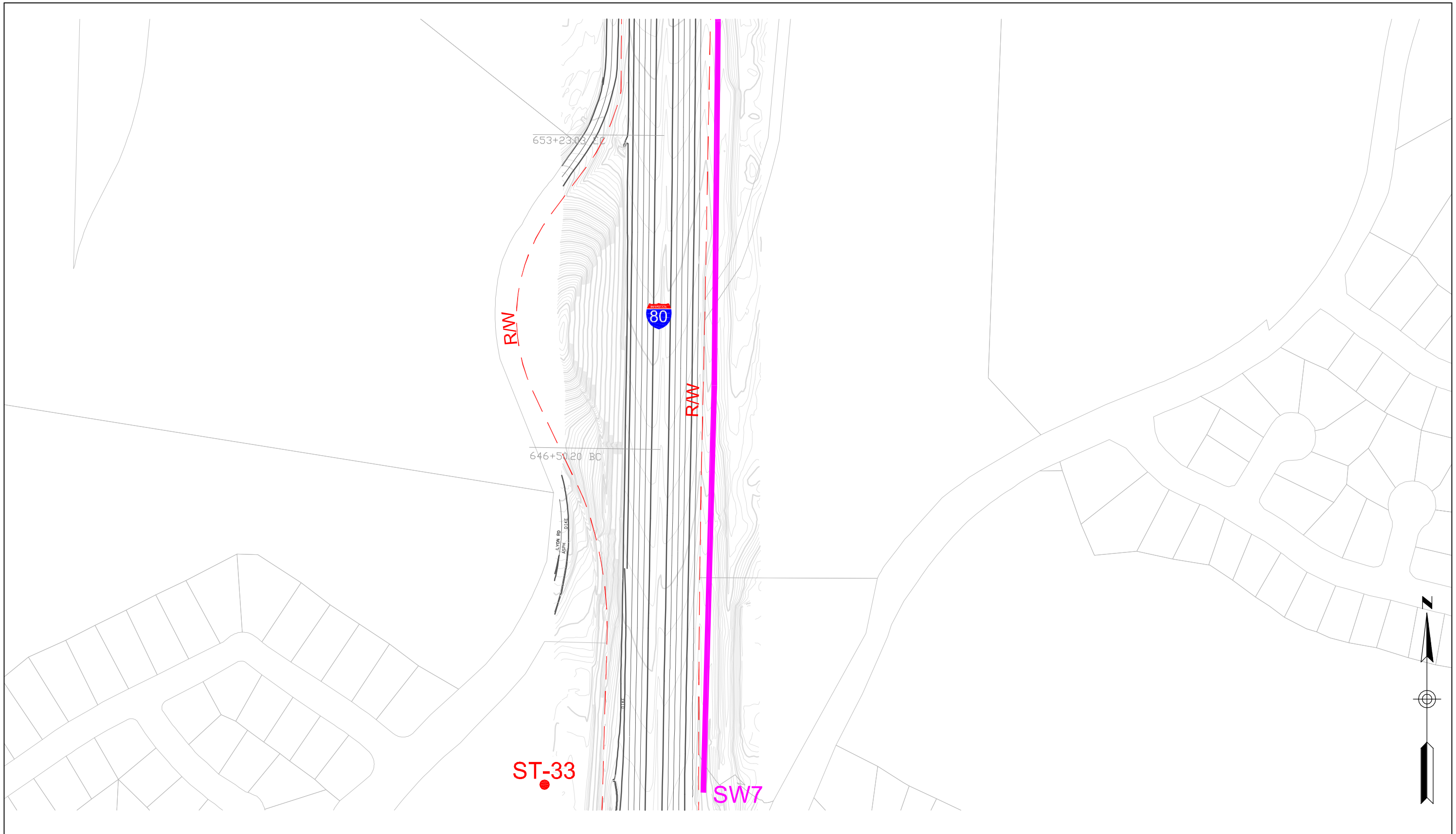
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 20 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

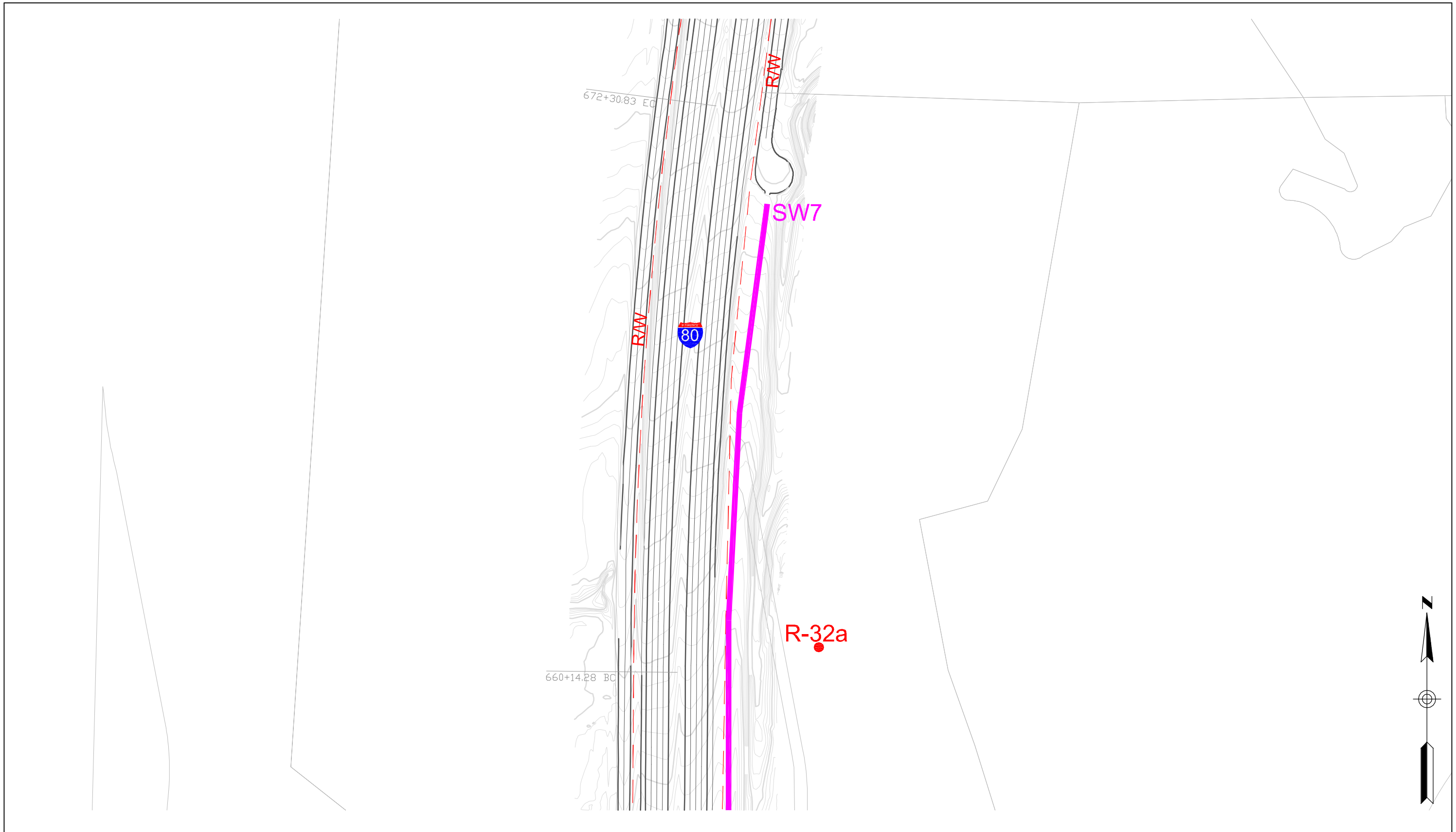
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 21 OF 41



LEGEND:

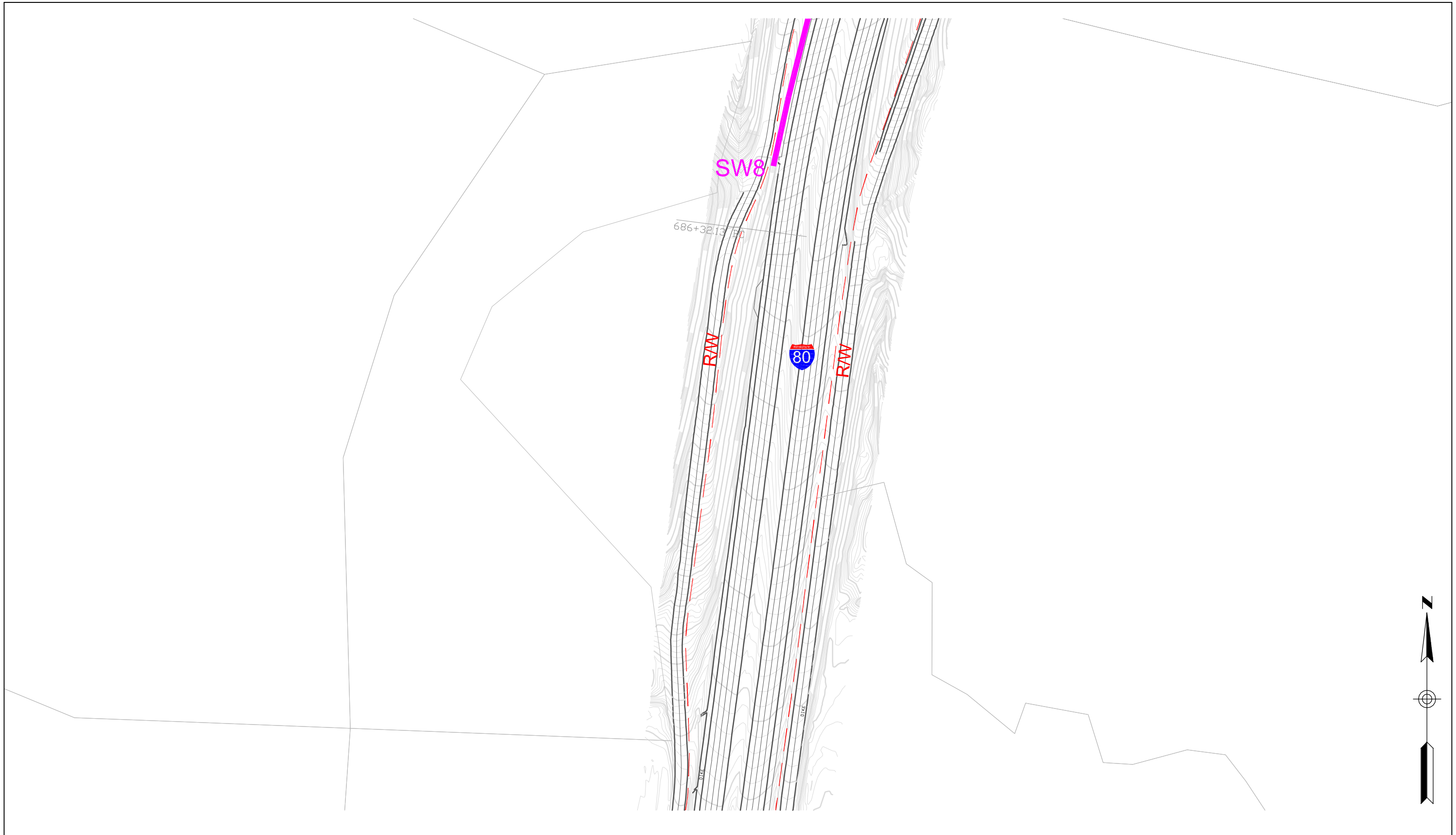
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

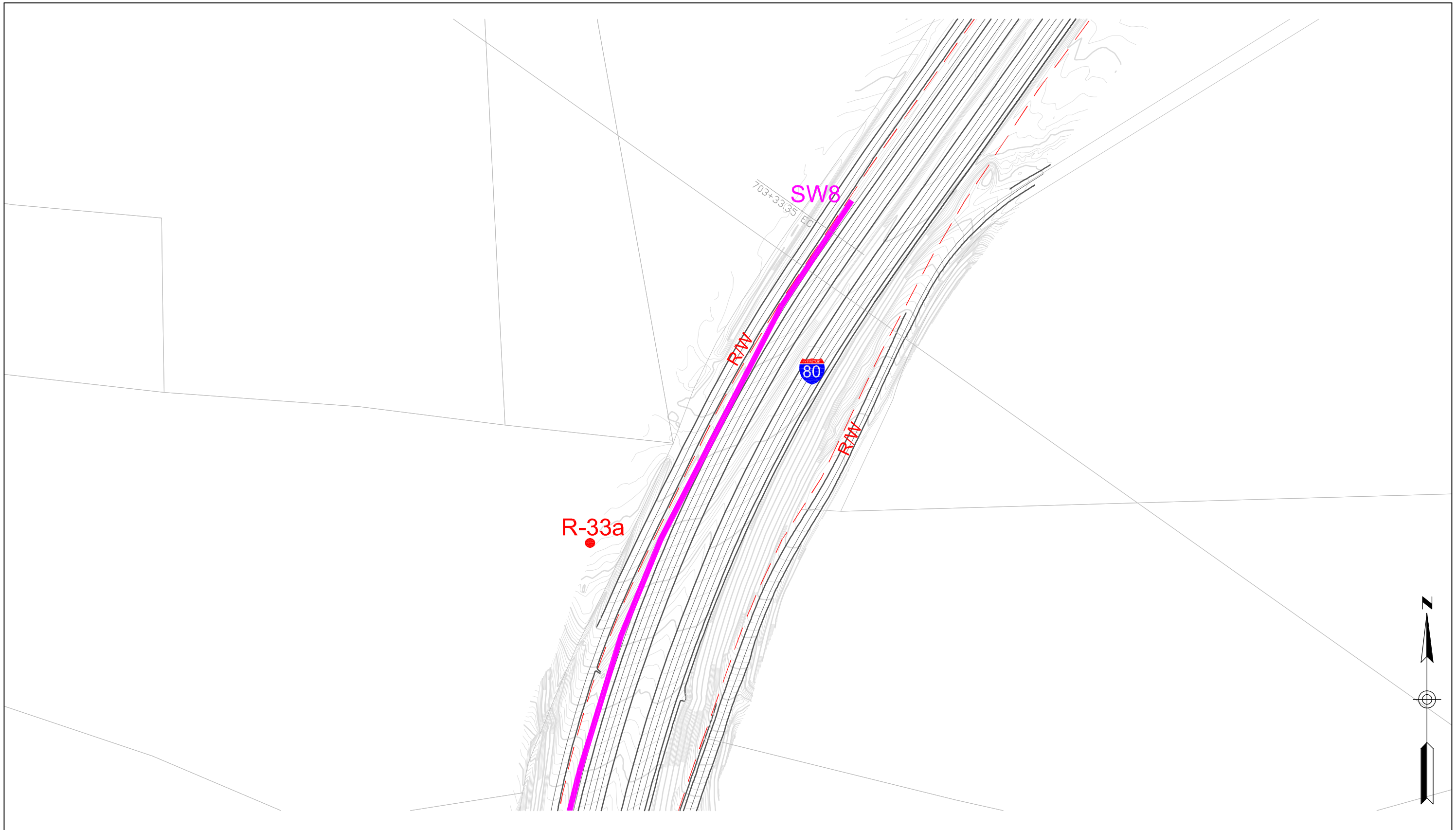
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 23OF 41



LEGEND:

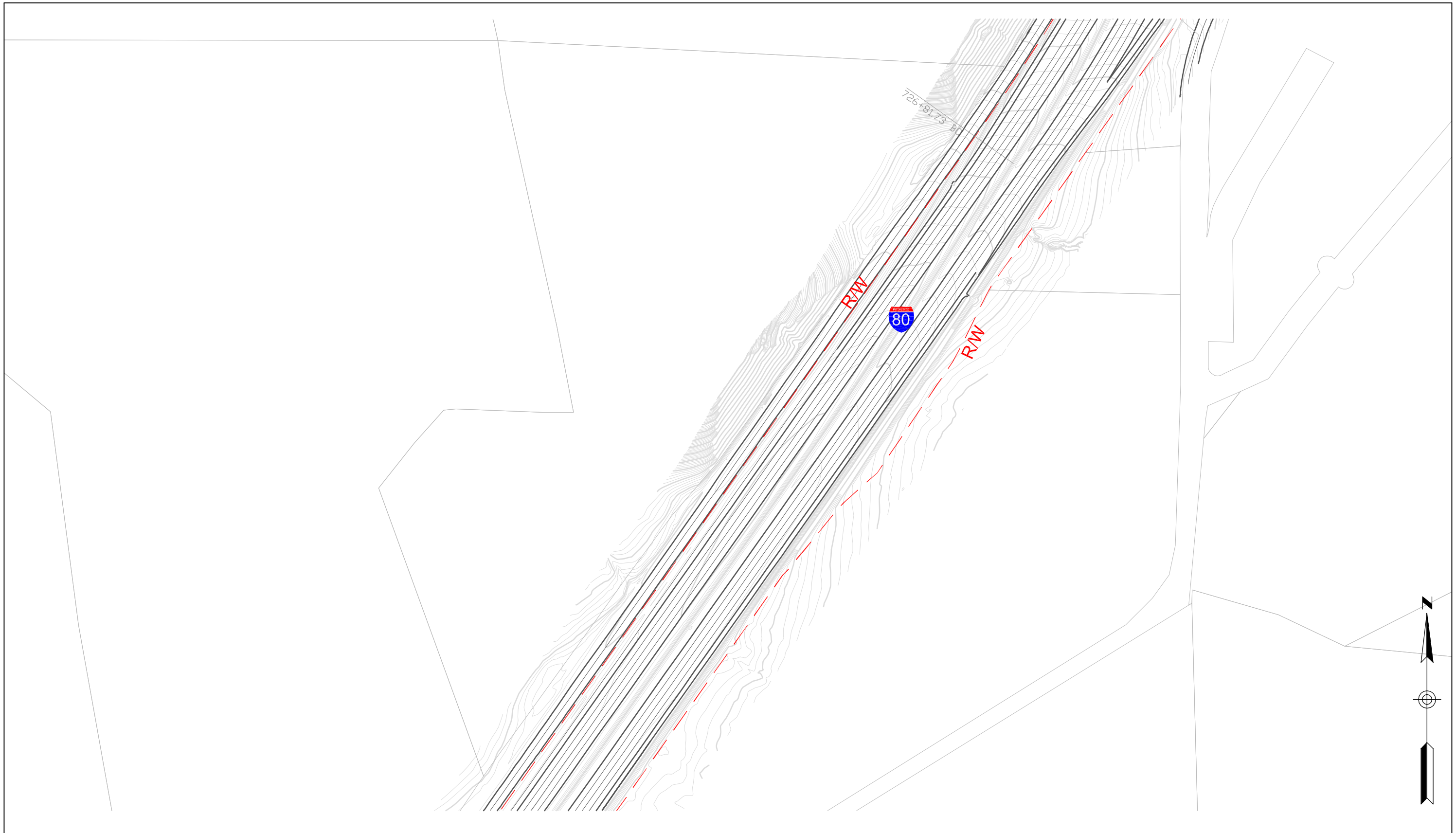
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

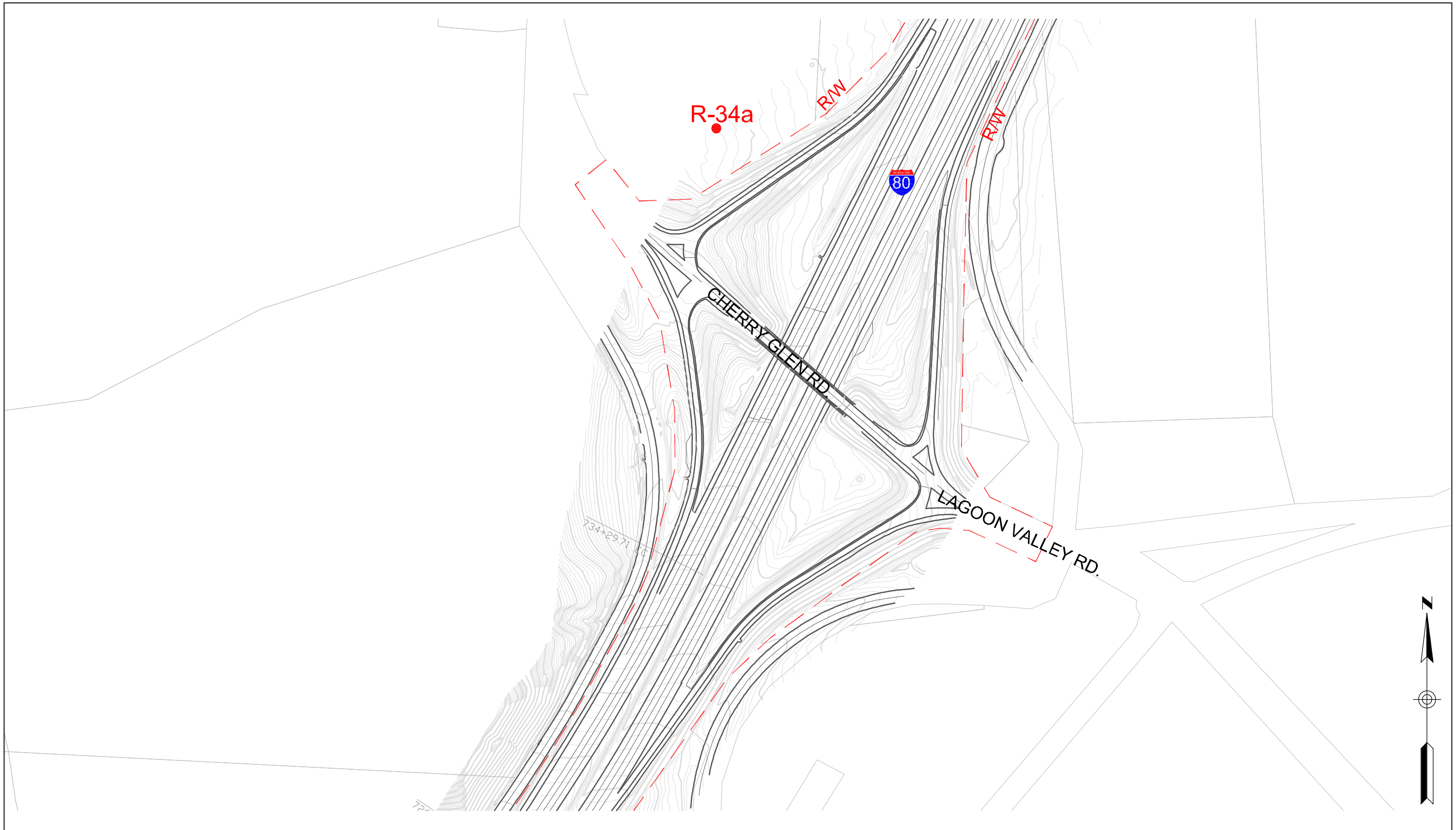
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 25 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

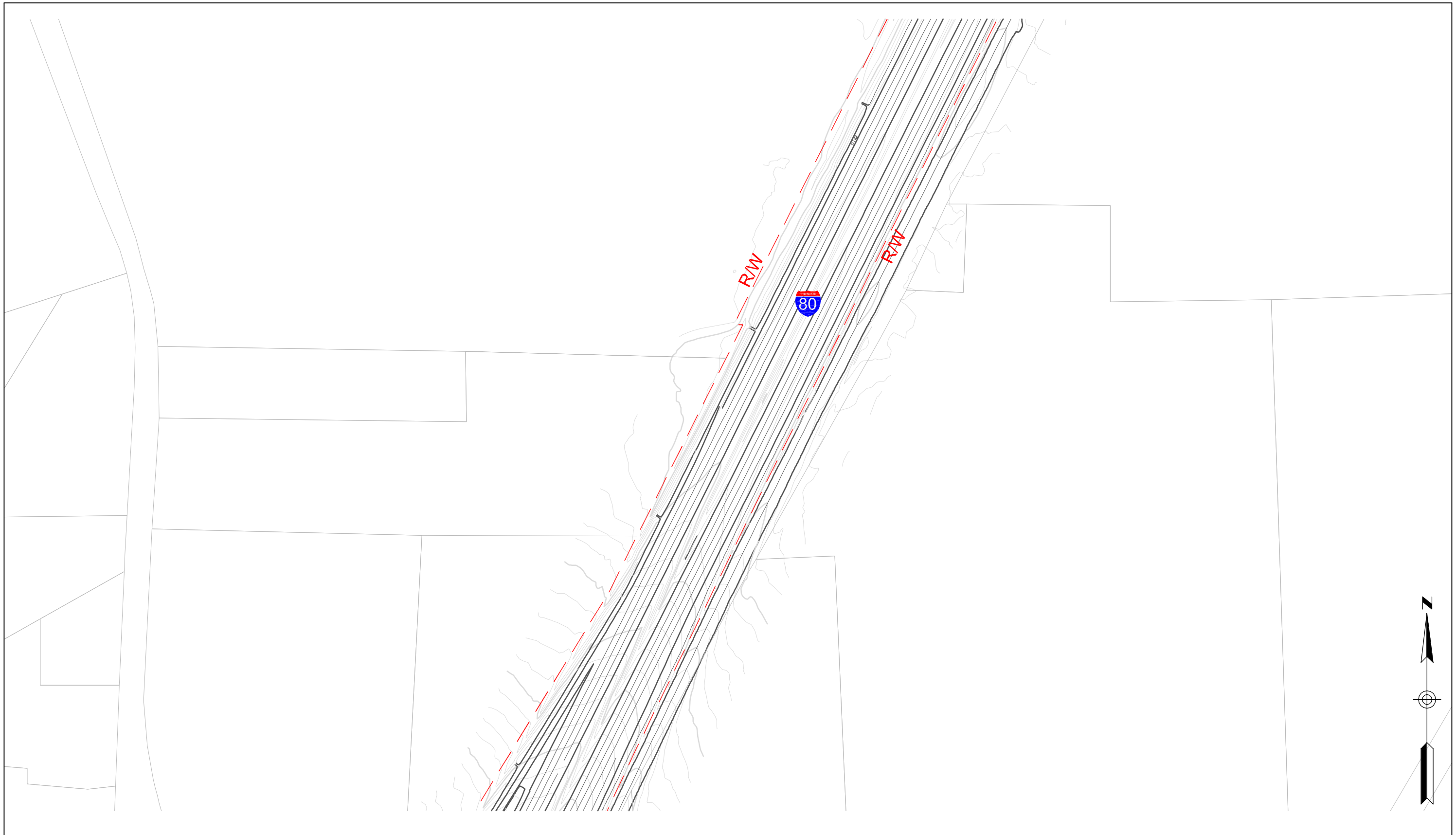
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 26 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

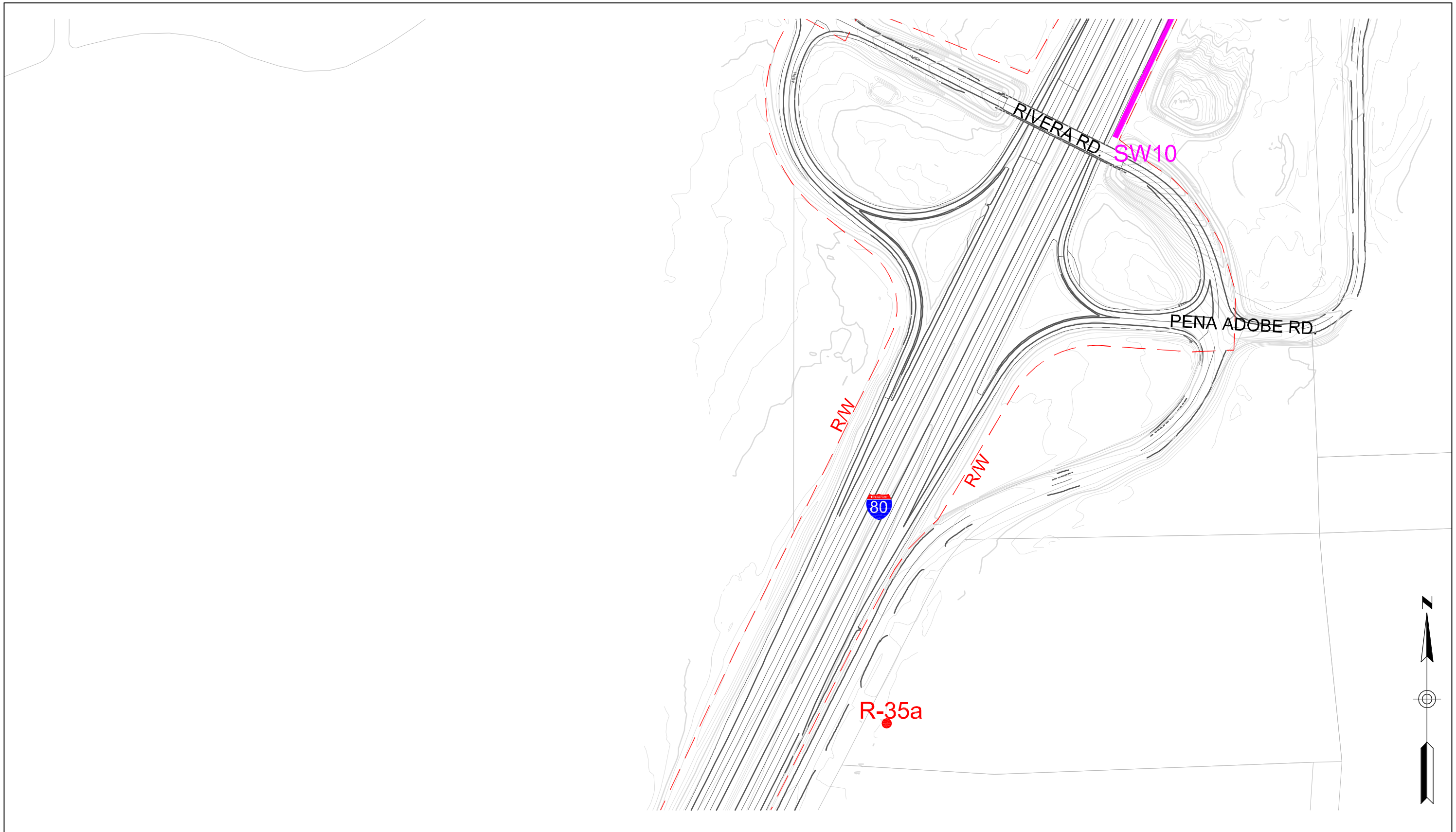
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 27 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

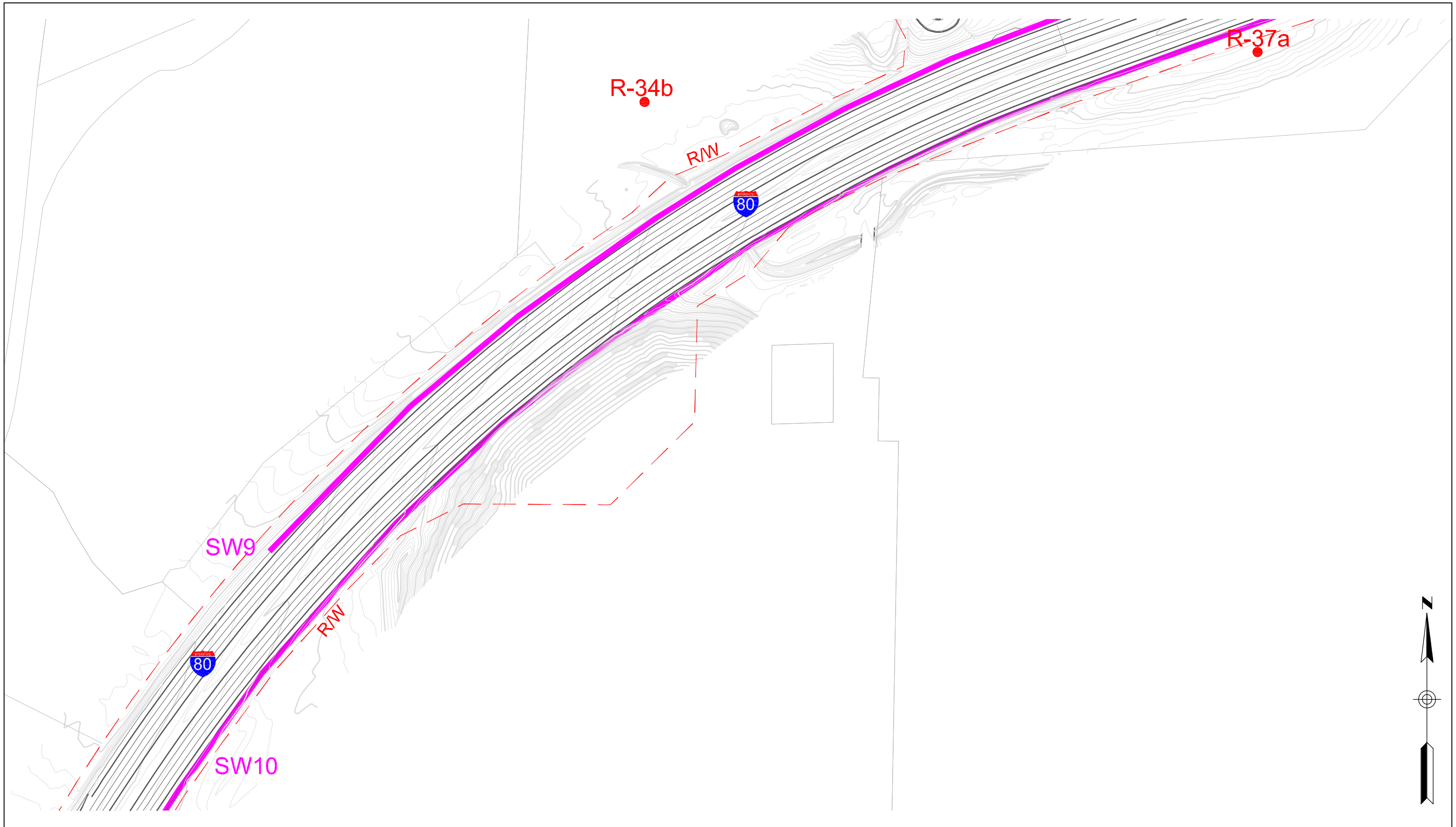
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 29 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

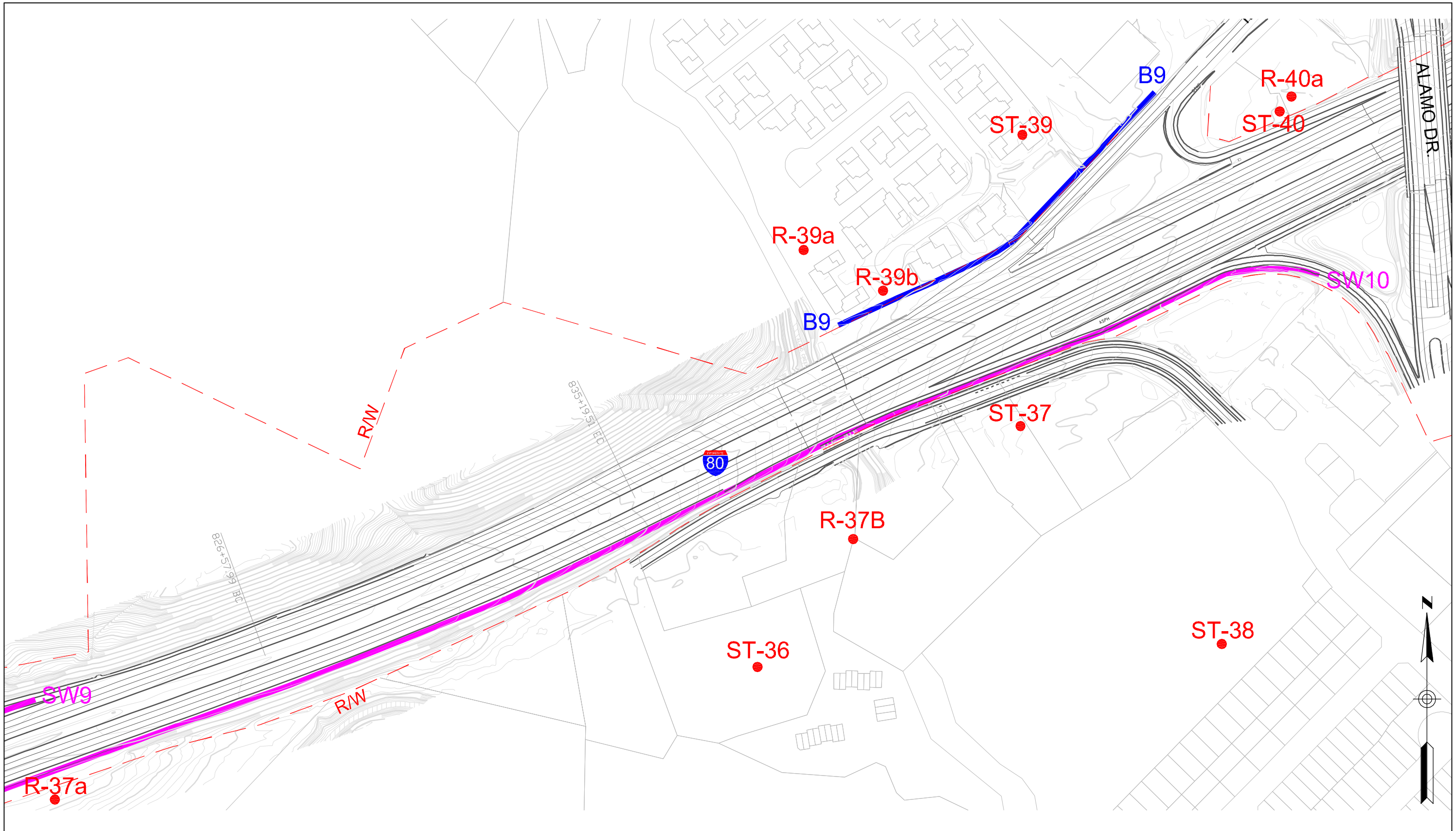
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 30 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

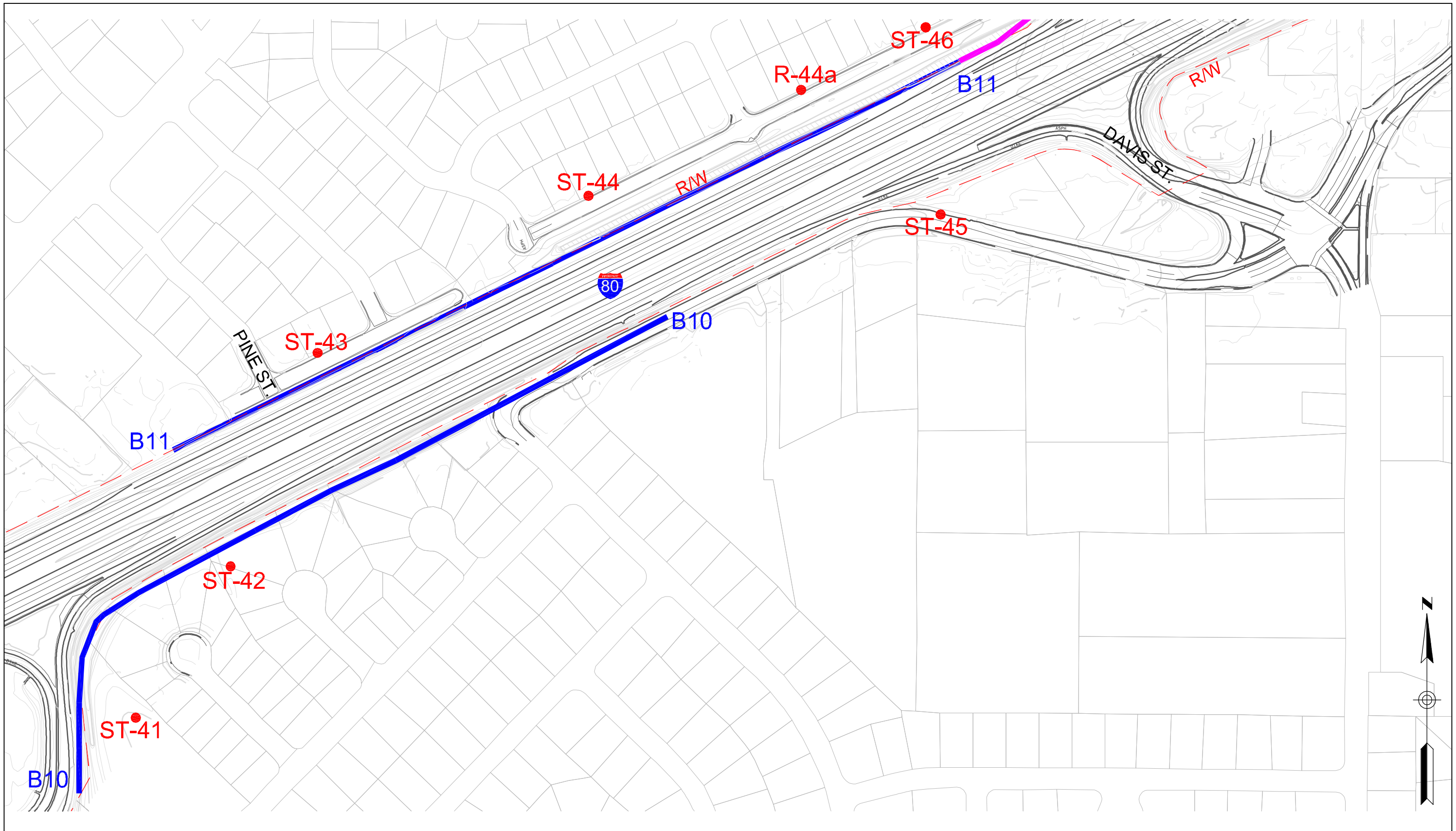
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 31 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT 200FT 400FT 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 32 OF 41

ELMIRA RD.

R/W

80

ST-47

SW11

DAVIS ST.

B11

ST-46a

ST-46

B11

R/W

DAVIS ST.

ST-45

N

LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

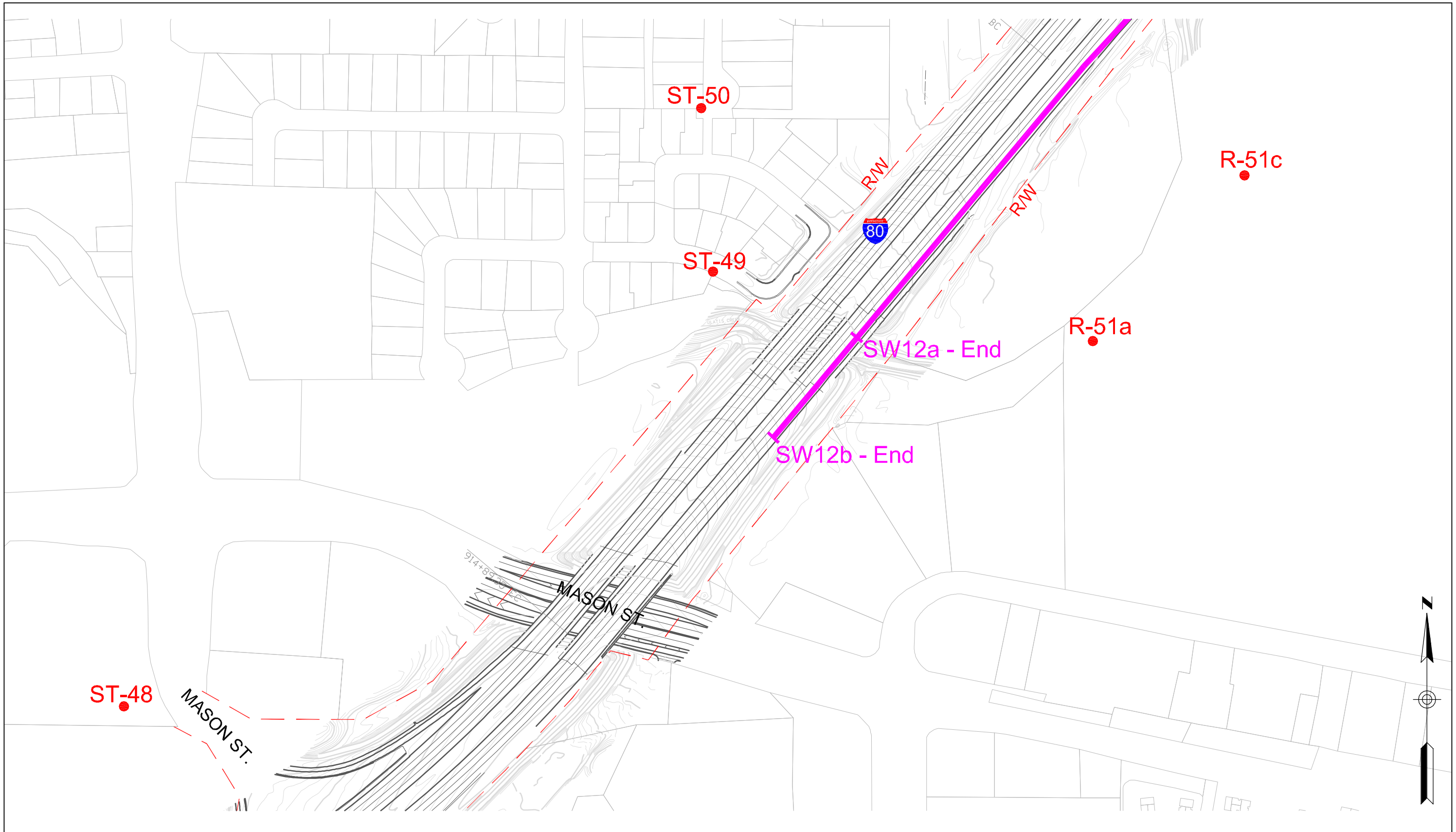
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 33 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

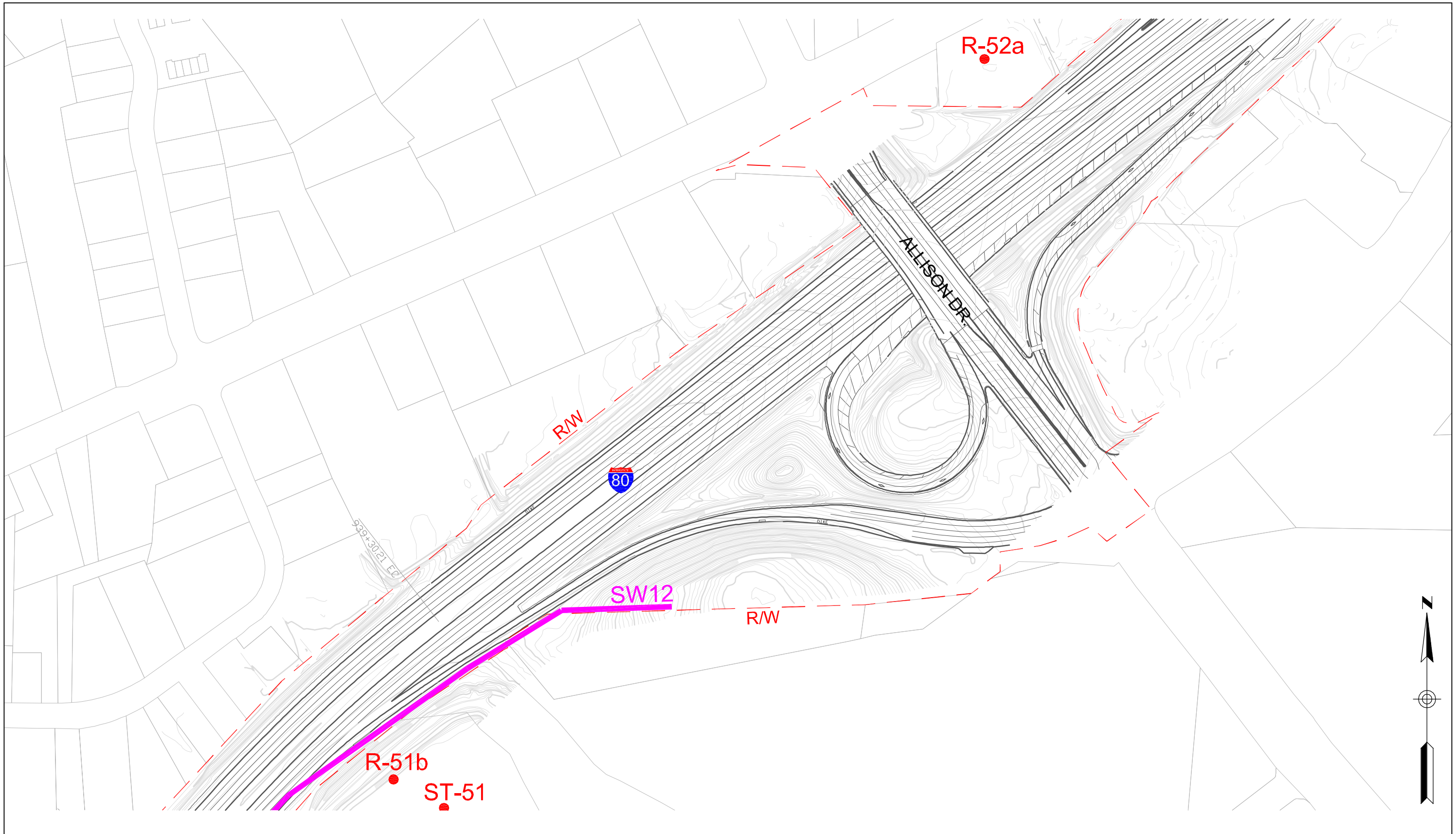
1: 200
FEET

0 FT 200FT 400FT 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 34 OF 41



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

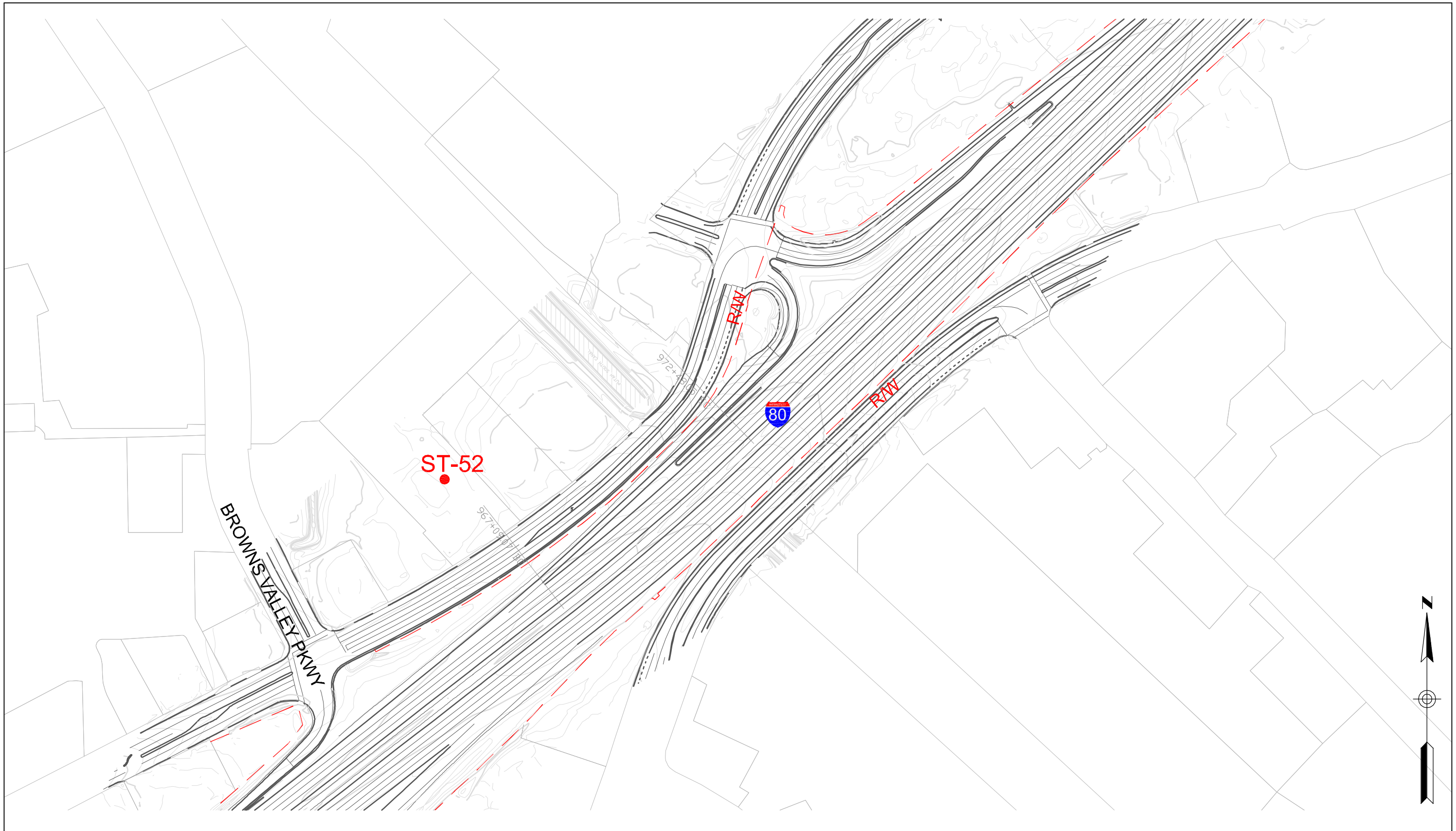
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 35 OF 41



LEGEND:

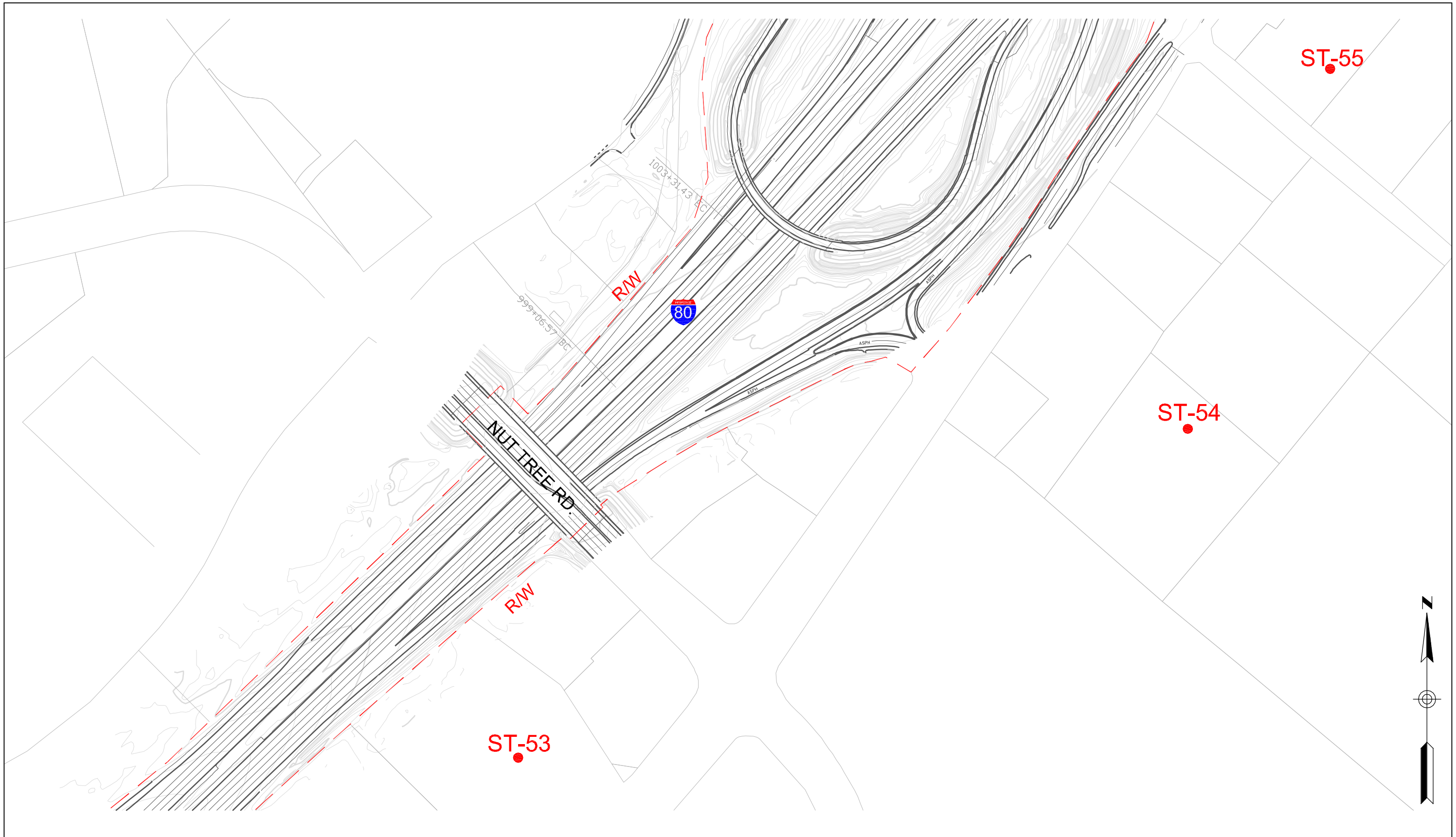
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

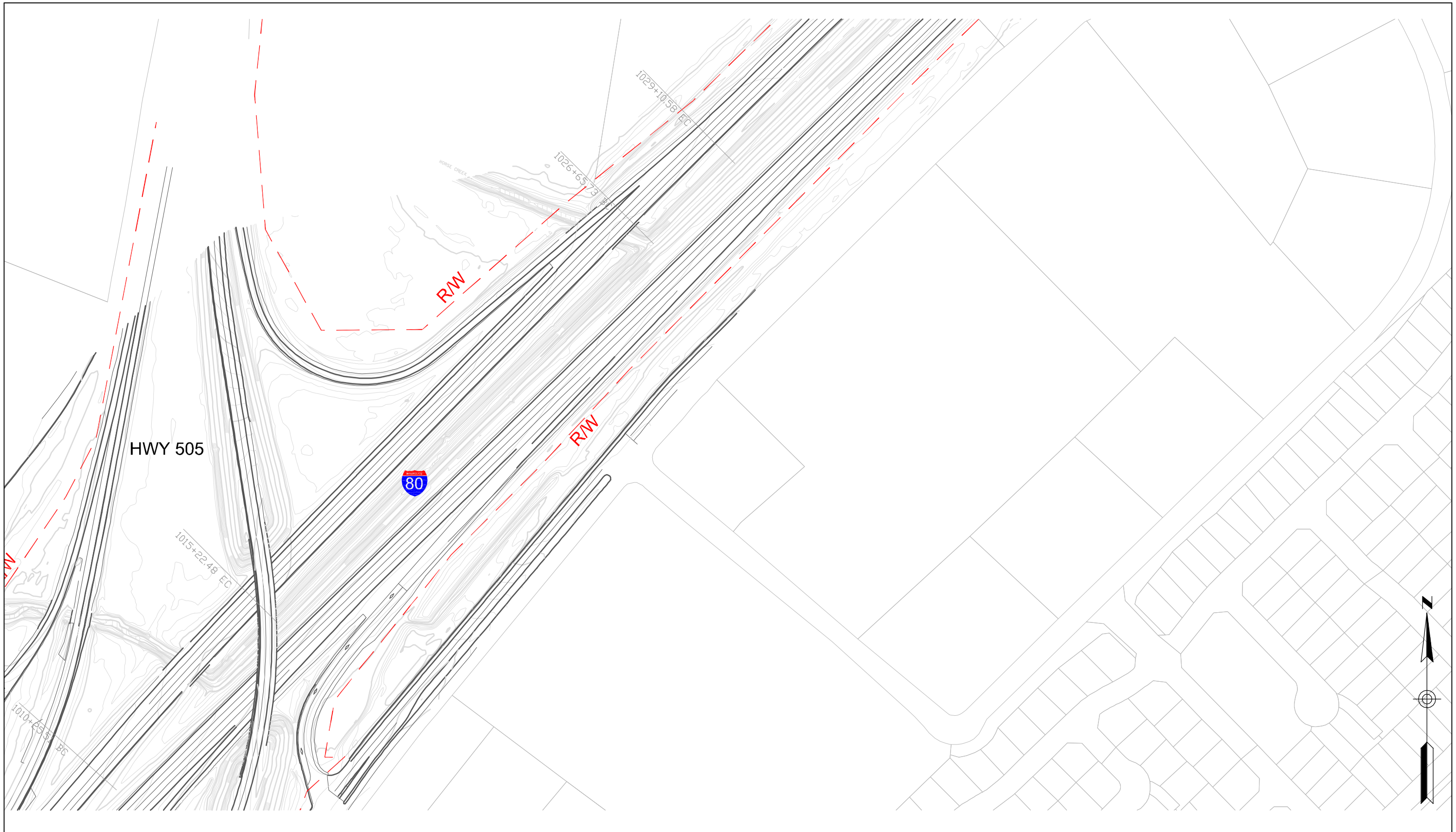
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

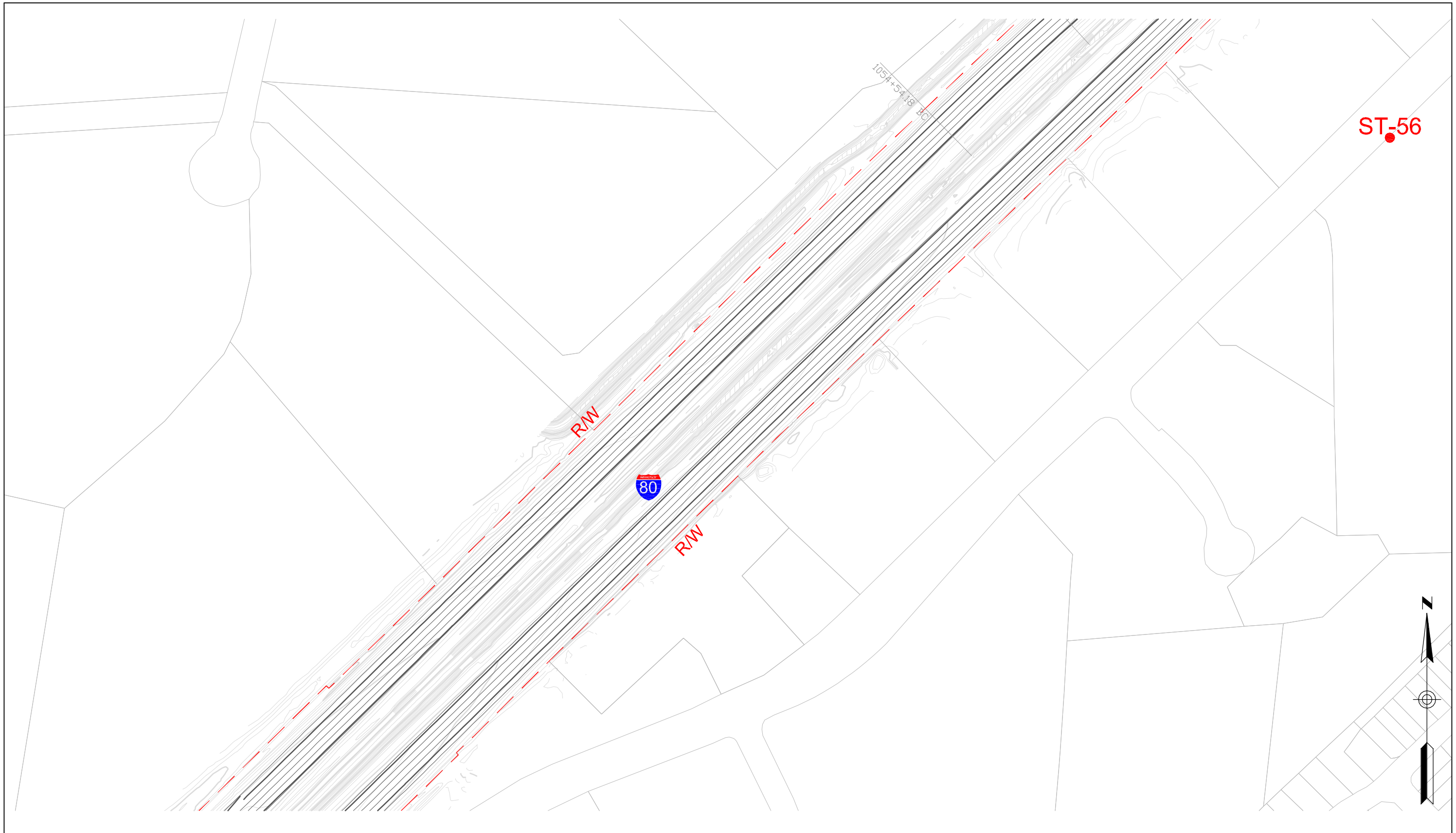
1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

SHEET NO. 38 OF 41



LEGEND:

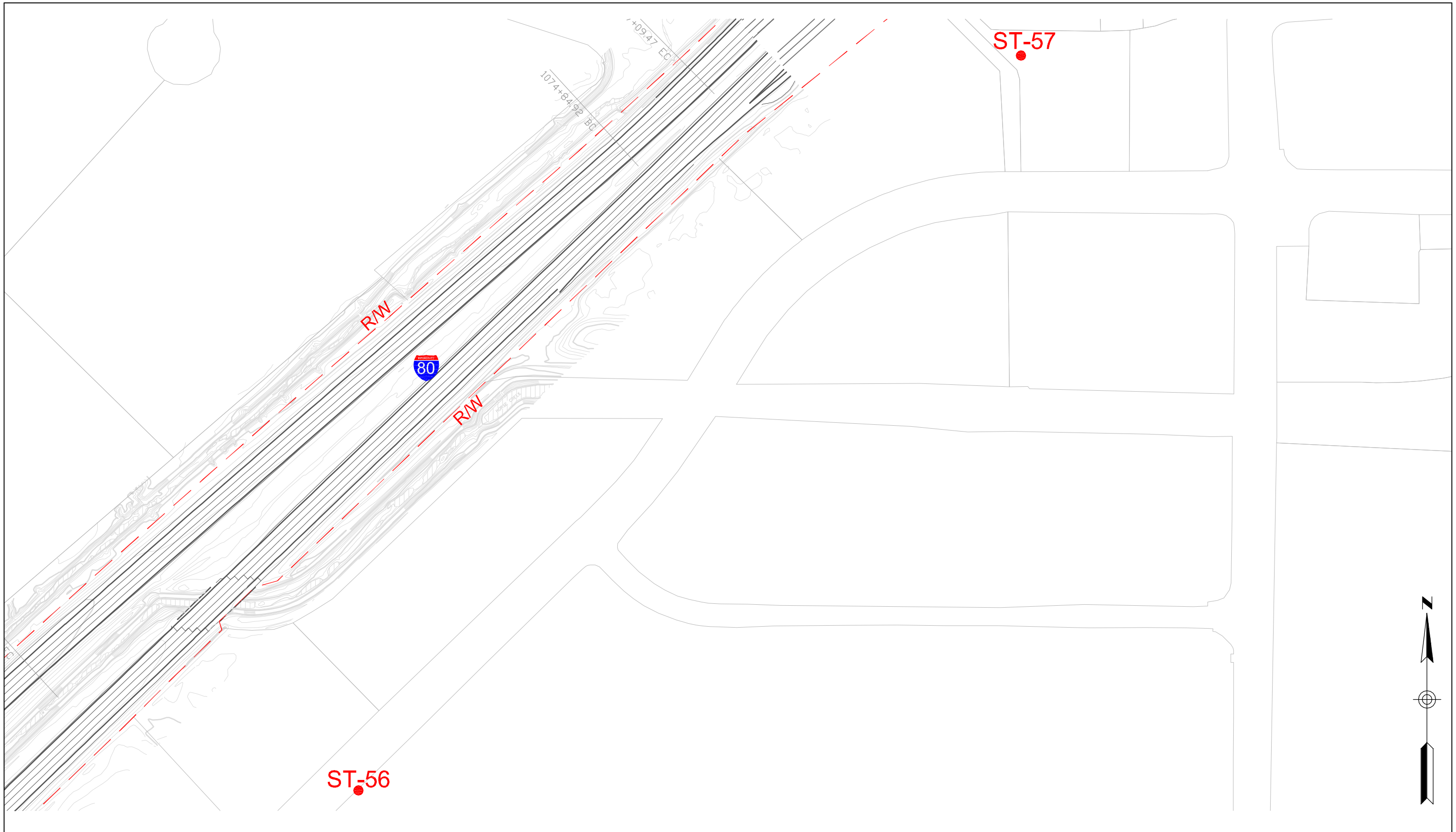
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

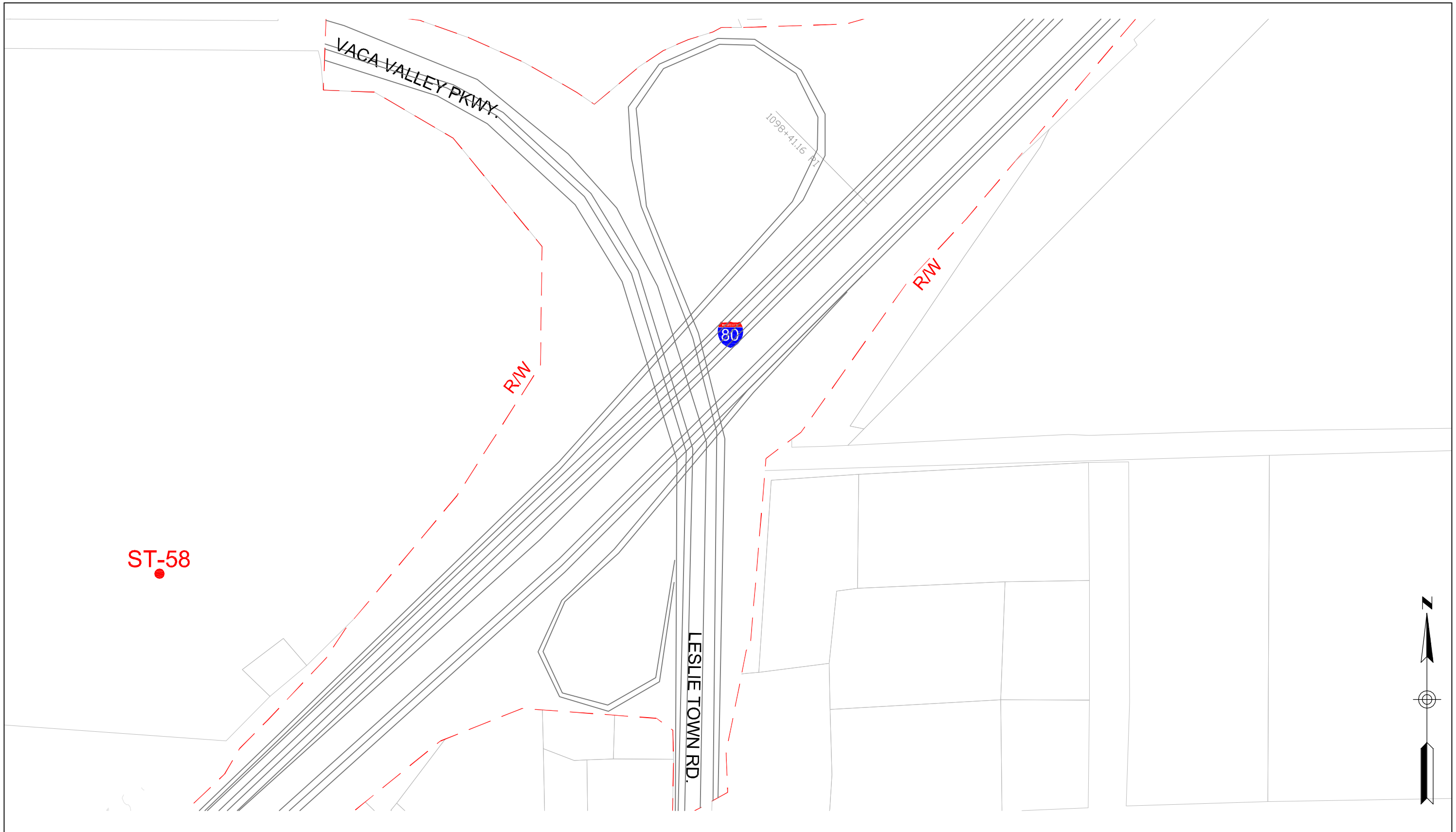
- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality



LEGEND:

- MODEL RECEPTOR
- EXISTING NOISE BARRIER
- EVALUATED NOISE BARRIER
- RIGHT-OF-WAY

1: 200
FEET

0 FT | 200FT | 400FT | 800FT

TRAFFIC NOISE MODEL RECEPTOR & NOISE BARRIER LOCATIONS

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

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APPENDIX H

Landcover Types in the BSA

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Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Land Cover

Barren

Coyote Brush Scrub

Developed

Non-Native Annual Grassland

Ruderal

Seasonal Drainage

* Previously Mitigated Permanent Impact Areas refer to impact areas of the current project that overlap with permanent impact areas of the ICP and Truck Scales projects that have already been mitigated.

0 100 200 400

Feet

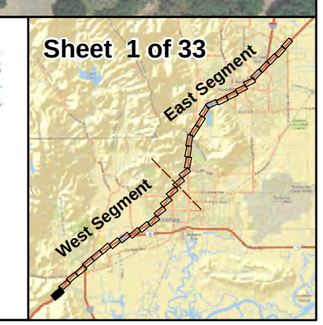
Sources:
Aerials 2013, Project Boundary, Impacts: Circlepoint
Land Cover Data: CCCI 2011-13, ICF International
ICP/Truck Scales Impacts: ICF International,
H.T. Harvey & Associates

H.T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 2: Habitat and Impacts Map

I-80 Express Lanes Project (3328-08)

September 2014



N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Land Cover

Barren

Developed

Non-Native Annual Grassland

Ruderal

Seasonal Drainage

Seasonal Wetland

* Previously Mitigated Permanent Impact Areas refer to impact areas of the current project that overlap with permanent impact areas of the ICP and Truck Scales projects that have already been mitigated.

N

0 100 200 400

Feet

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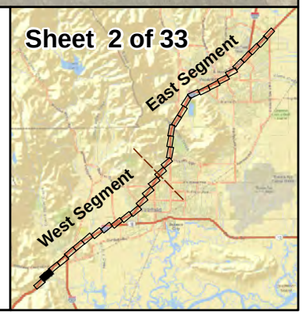

N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Land Cover

Barren

Developed

Mixed Oak Woodland

Non-Native Annual Grassland

Riparian Woodland

Ruderal

Seasonal Drainage

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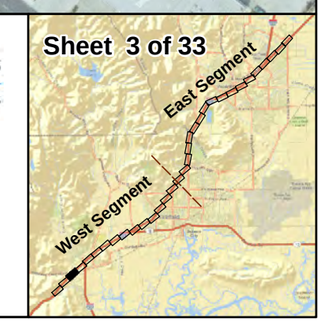
I-80 Express Lanes Project (3328-08)

September 2014



N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Land Cover

Barren

Developed

Eucalyptus

Non-Native Annual Grassland

Ruderal

Seasonal Drainage

Seasonal Wetland

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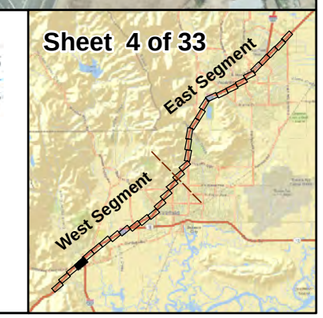

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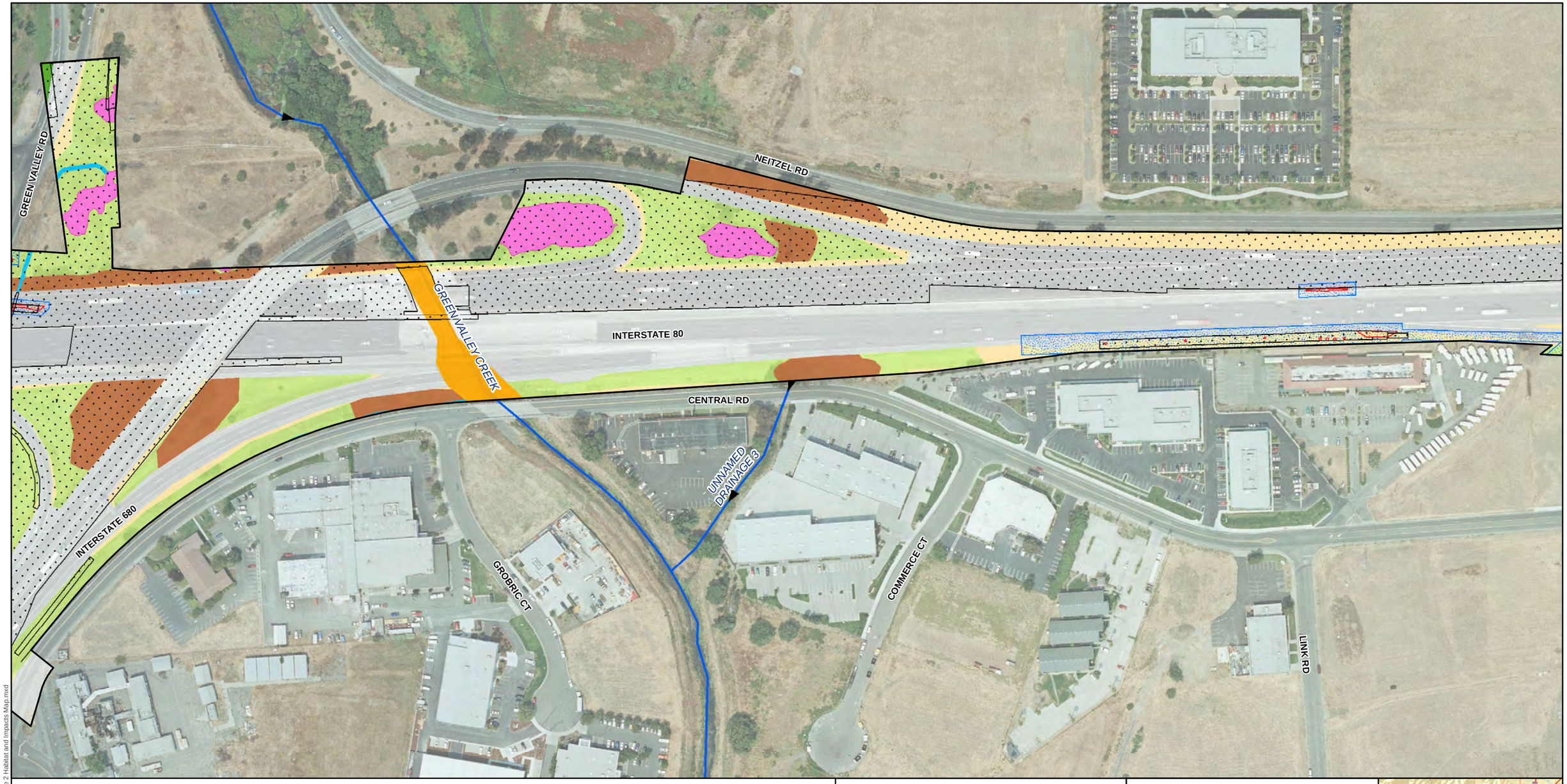

Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Land Cover

Barren

Developed

Eucalyptus

Landscaped

Non-Native Annual Grassland

Perennial Wetland

Seasonal Drainage

Seasonal Wetland

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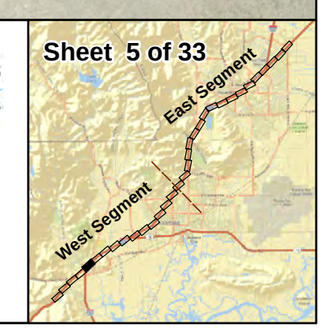

N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Land Cover

Barren

Developed

Eucalyptus

Landscaped

Mixed Oak Woodland

Non-Native Annual Grassland

Perennial Drainage

Perennial Wetland

Riparian Woodland

Ruderal

Seasonal Drainage

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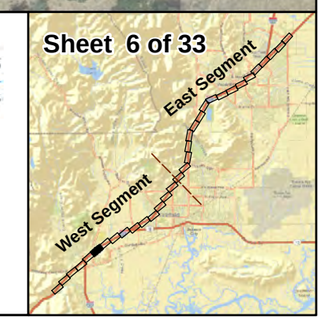

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Project Boundary
Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent
Temporary
Elderberry Shrub

Land Cover

Barren
Developed
Mixed Oak Woodland
Non-Native Annual Grassland
Perennial Drainage
Perennial Wetland
Riparian Woodland
Ruderal
Seasonal Drainage

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Feet

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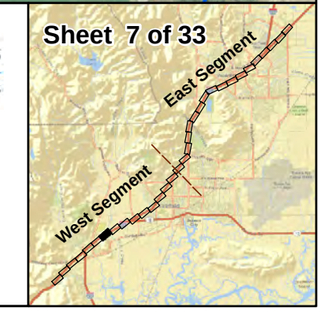

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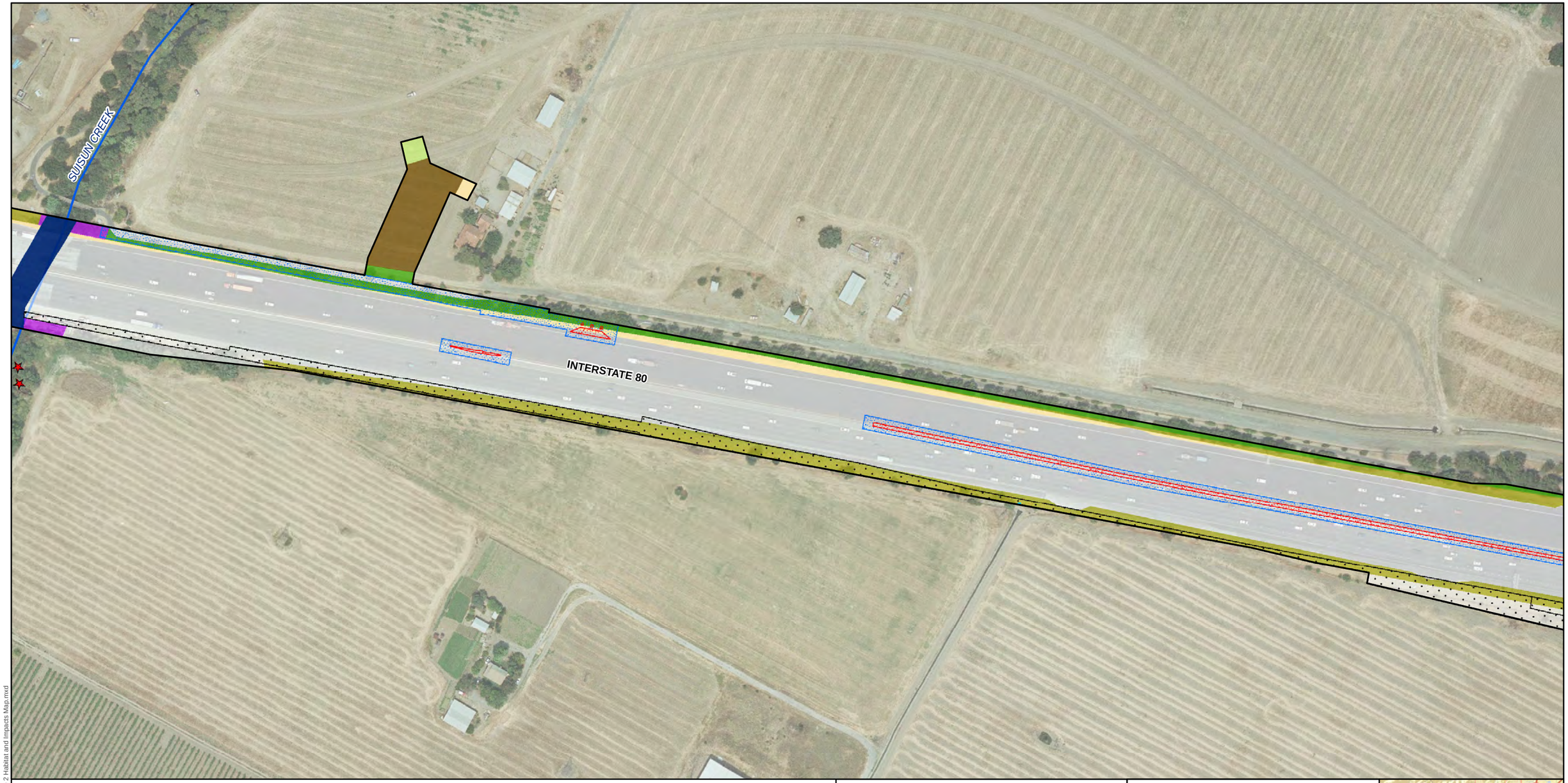

Project Boundary
Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent
Temporary
Elderberry Shrub

Land Cover

Barren
Developed
Landscaped
Non-Native Annual Grassland
Perennial Drainage
Riparian Woodland
Row Crops
Ruderal
Seasonal Drainage

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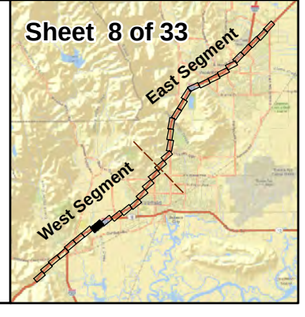

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Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Elderberry Shrub

Land Cover

Barren

Developed

Landscaped

Non-Native Annual Grassland

Row Crops

Ruderal

Seasonal Drainage

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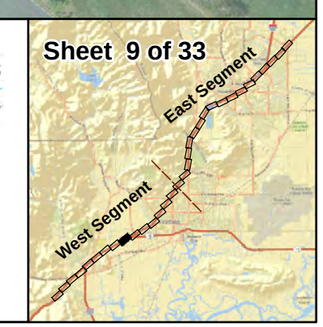

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Project Boundary

Previously Mitigated Permanent Impact Areas*

Project Impacts

Permanent

Temporary

Elderberry Shrub

Land Cover

Barren

Developed

Landscaped

Mixed Oak Woodland

Non-Native Annual Grassland

Ruderal

Seasonal Drainage

Seasonal Wetland

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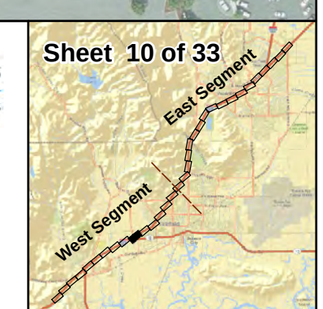
I-80 Express Lanes Project (3328-08)

September 2014



N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Project Impacts

Permanent

Temporary

Land Cover

Developed

Eucalyptus

Landscaped

Non-Native Annual Grassland

Ruderal

Seasonal Drainage

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I-80 Express Lanes Project (3328-08)

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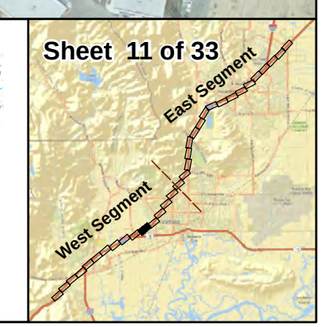

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Project Boundary

Project Impacts

- Permanent
- Temporary
- Ferris' Goldfields

Land Cover

- Barren
- Coyote Brush Scrub
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Drainage
- Riparian Woodland
- Ruderal
- Seasonal Drainage

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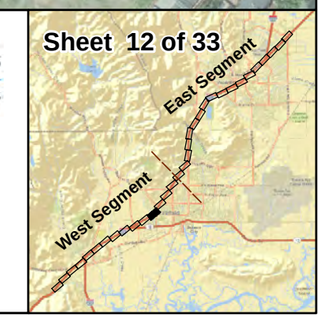
Figure 2: Habitat and Impacts Map

I-80 Express Lanes Project (3328-08)

September 2014

Sheet 12 of 33



N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Barren
- Coyote Brush Scrub
- Developed
- Eucalyptus
- Landscaped
- Non-Native Annual Grassland
- Riparian Woodland
- Ruderal
- Seasonal Drainage

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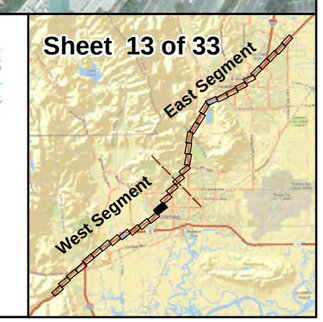

N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Developed
- Eucalyptus
- Landscaped
- Non-Native Annual Grassland
- Perennial Wetland
- Ruderal
- Seasonal Drainage

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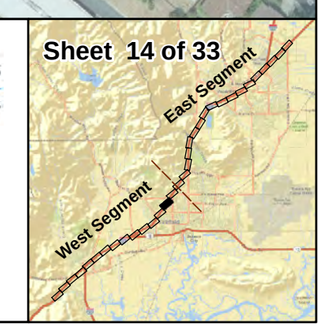

N:\Projects3300\3328-08\Reports\NES September 2014\Figure 2 Habitat and Impacts Map.mxd

Project Boundary

Project Impacts

Permanent

Temporary

Land Cover

Barren

Developed

Eucalyptus

Landscaped

Ruderal

Seasonal Drainage

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I-80 Express Lanes Project (3328-08)

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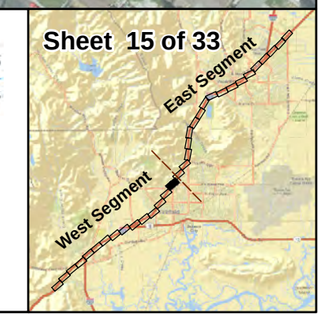

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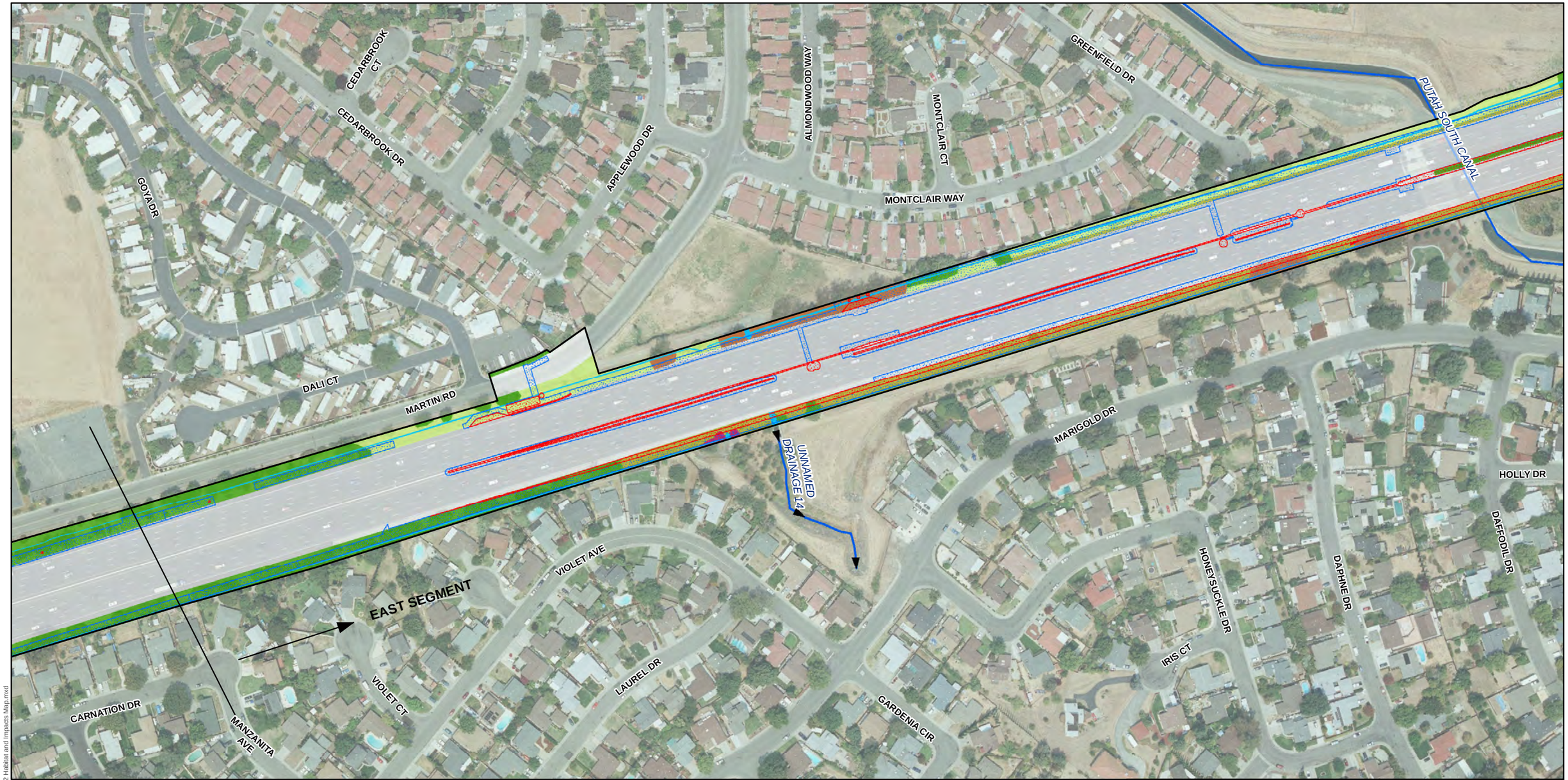

Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Ruderal
- Seasonal Drainage

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I-80 Express Lanes Project (3328-08)

September 2014

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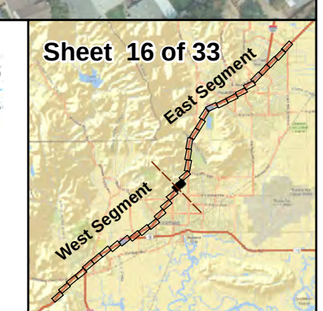

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Barren
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Drainage
- Perennial Wetland
- Riparian Woodland
- Ruderal
- Seasonal Drainage
- Seasonal Wetland

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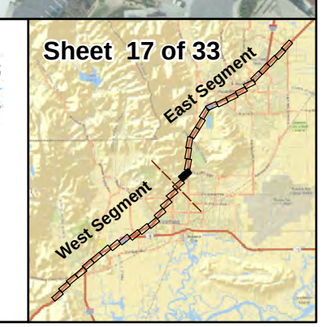

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Coyote Brush Scrub
- Developed
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Wetland
- Ruderal
- Seasonal Drainage
- Seasonal Wetland

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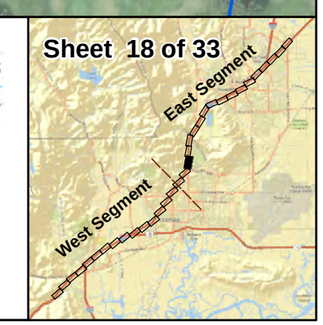

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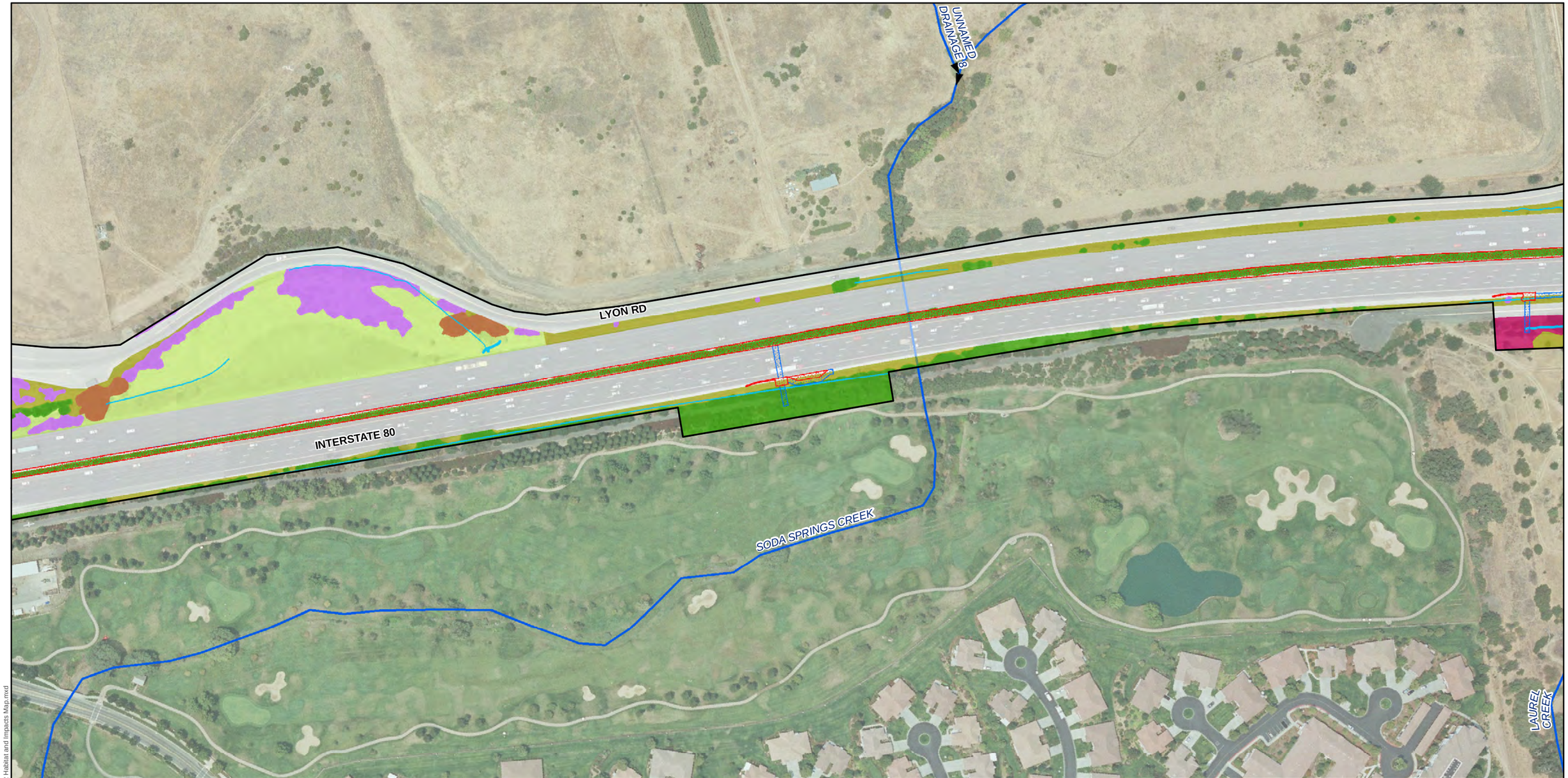

Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Coyote Brush Scrub
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Ruderal
- Seasonal Drainage

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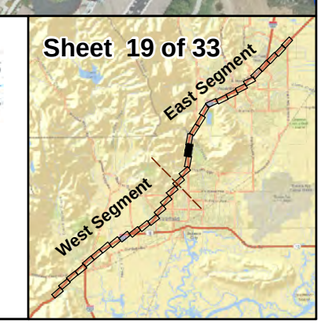

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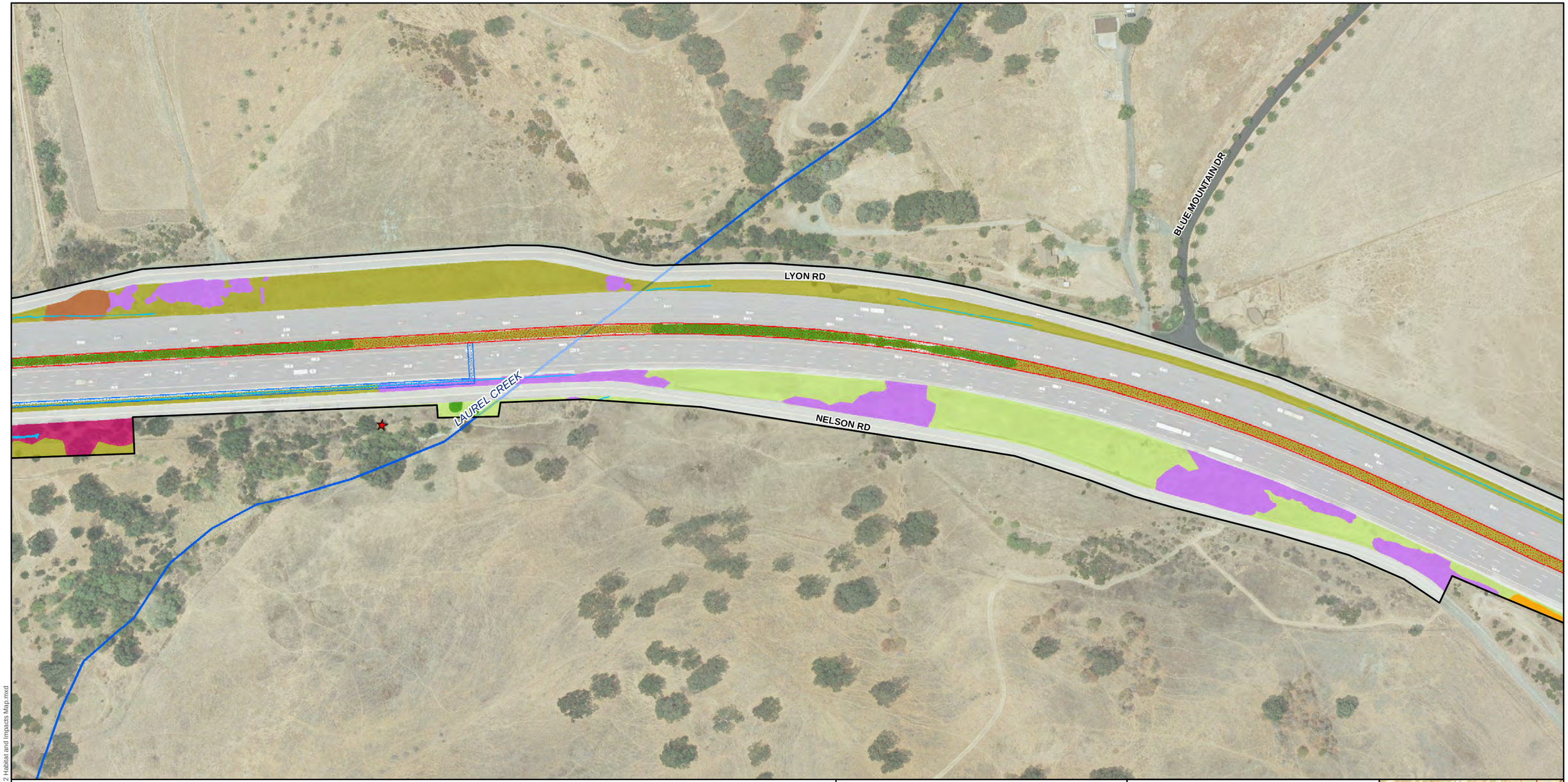

Project Boundary

Project Impacts

- Permanent
- Temporary
- Elderberry Shrub

Land Cover

- Coyote Brush Scrub
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Wetland
- Ruderal
- Seasonal Drainage

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Feet

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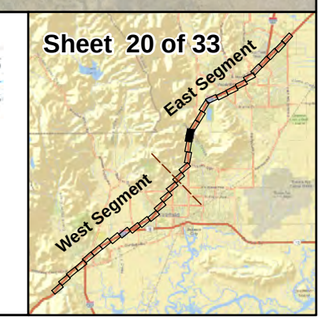
Figure 2: Habitat and Impacts Map

I-80 Express Lanes Project (3328-08)

September 2014



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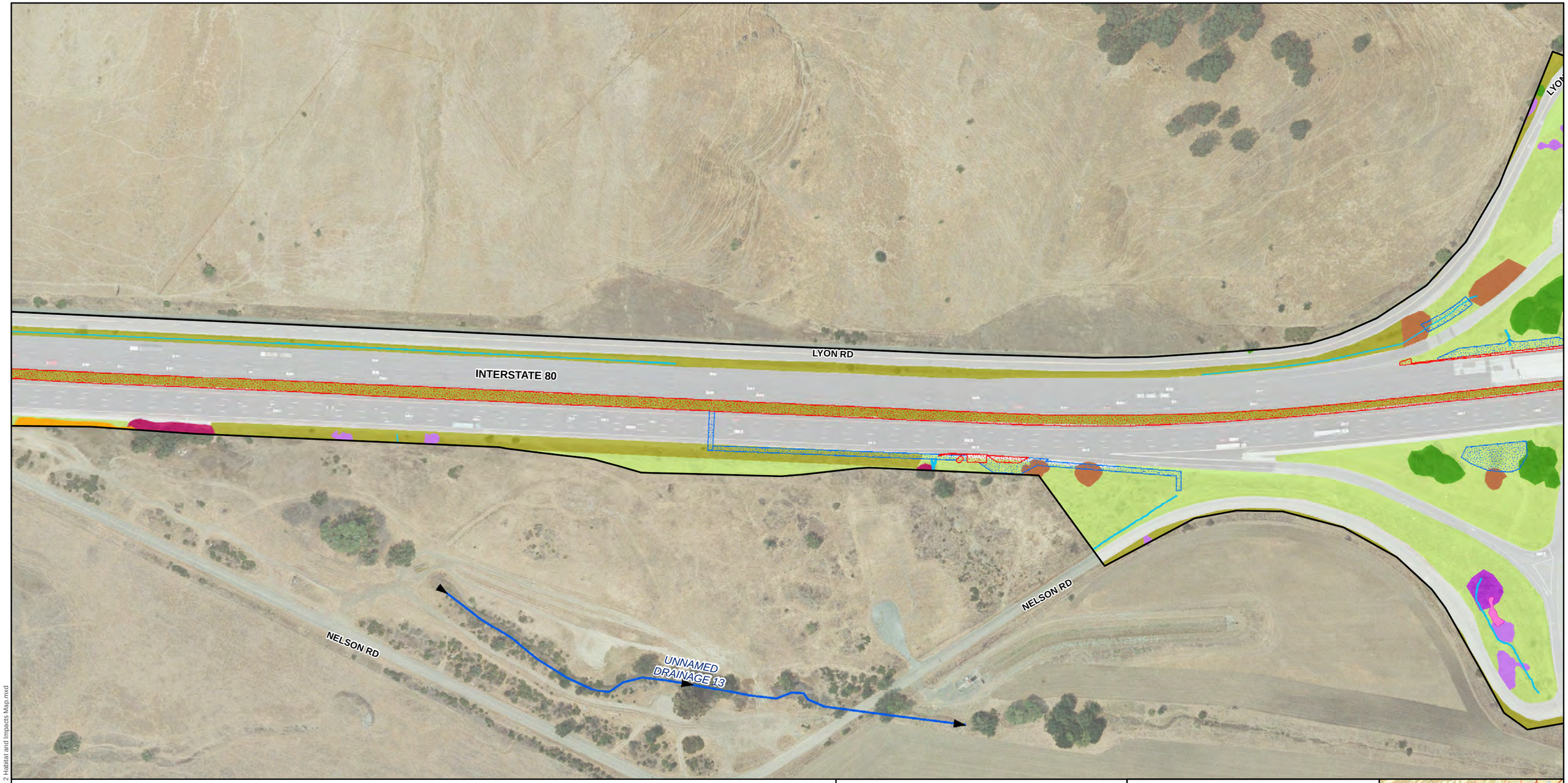

Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Coyote Brush Scrub
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Wetland
- Riparian Woodland
- Ruderal
- Seasonal Drainage
- Seasonal Wetland

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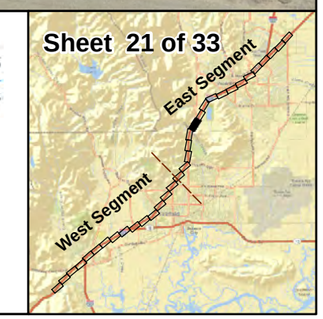

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Barren
- Coyote Brush Scrub
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Row Crops
- Ruderal
- Seasonal Drainage

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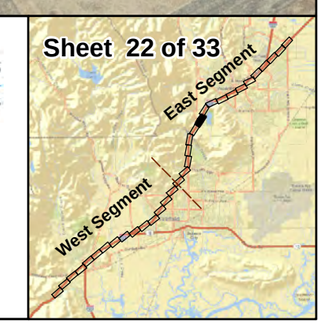

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Project Boundary

Project Impacts

- Permanent
- Temporary
- Elderberry Shrub
- Swainson's Hawk CNDDB Record

Land Cover

- Barren
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Drainage
- Riparian Woodland
- Row Crops
- Ruderal
- Seasonal Drainage
- Seasonal Wetland

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I-80 Express Lanes Project (3328-08)

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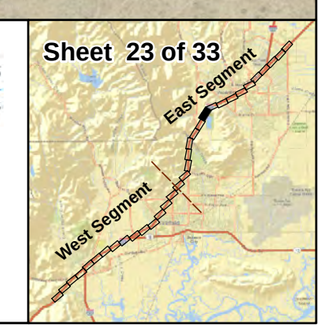

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Project Boundary

Project Impacts

- Permanent
- Temporary
- Elderberry Shrub

Land Cover

- Coyote Brush Scrub
- Developed
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- Mixed Oak Woodland
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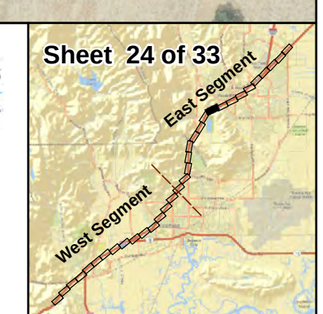

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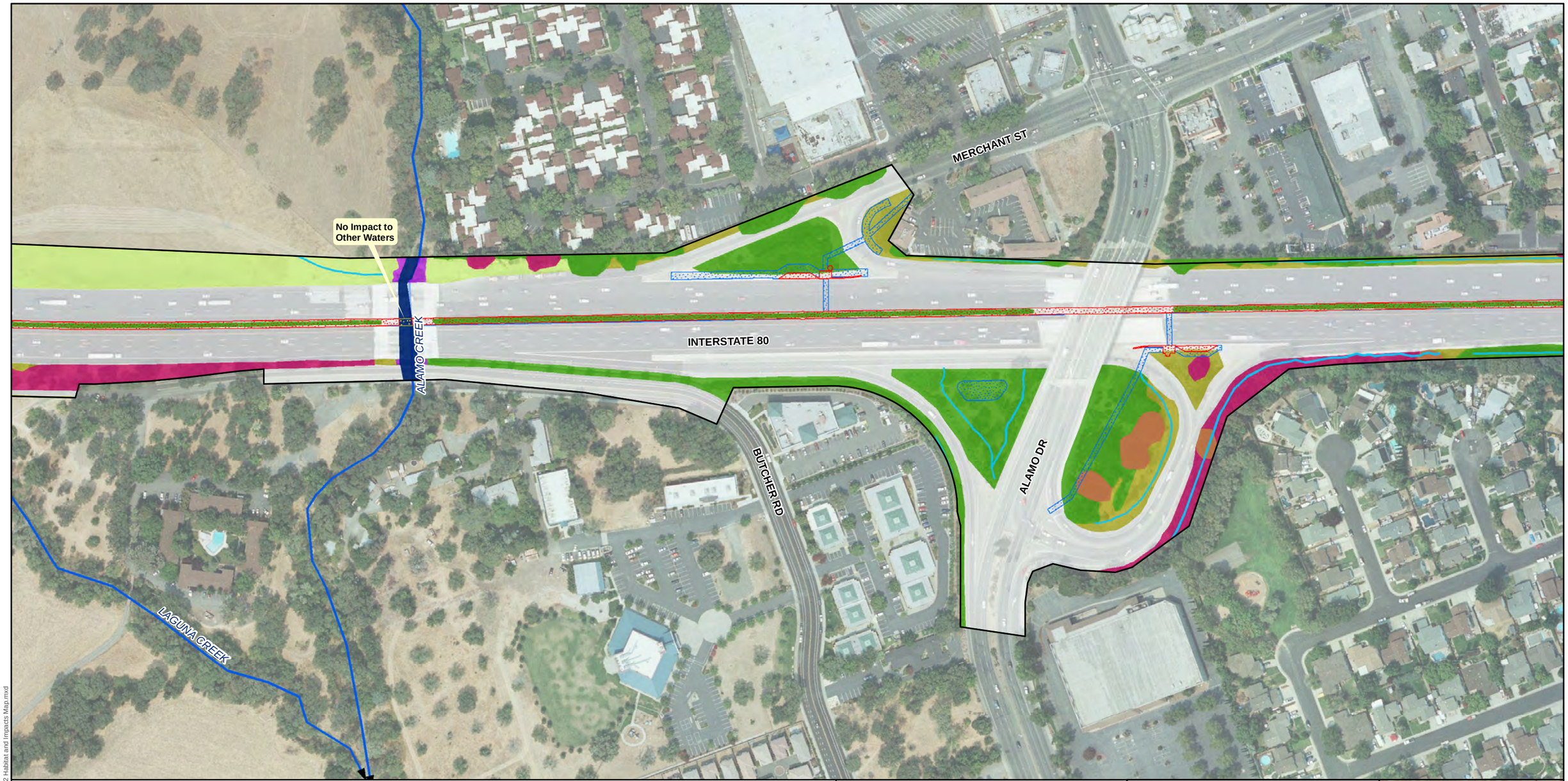

Project Boundary

Project Impacts

- Permanent
- Temporary
- No Impact

Land Cover

- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Drainage
- Riparian Woodland
- Ruderal
- Seasonal Drainage

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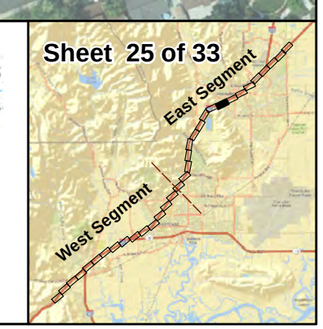

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Developed
- Eucalyptus
- Landscaped
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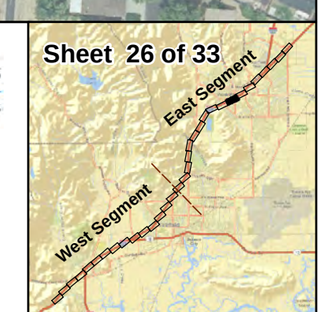

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
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I-80 Express Lanes Project (3328-08)

September 2014

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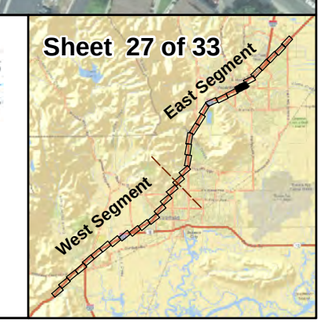

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Project Boundary

Project Impacts

- Permanent
- Temporary
- Elderberry Shrub

Land Cover

- Barren
- Developed
- Eucalyptus
- Landscaped
- Mixed Oak Woodland
- Non-Native Annual Grassland
- Perennial Drainage
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I-80 Express Lanes Project (3328-08)

September 2014

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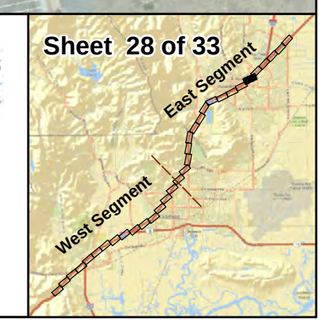

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Project Boundary

Seasonal Drainage

Project Impacts

Permanent

Temporary

Land Cover

Developed

Landscaped

Ruderal

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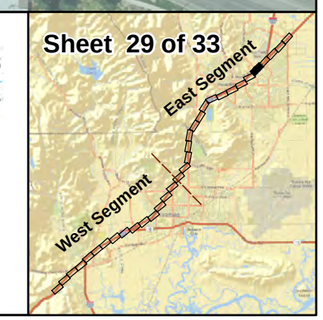

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Project Boundary

Project Impacts

- Permanent
- Temporary
- No Impact

Land Cover

- Barren
- Developed
- Eucalyptus
- Landscaped
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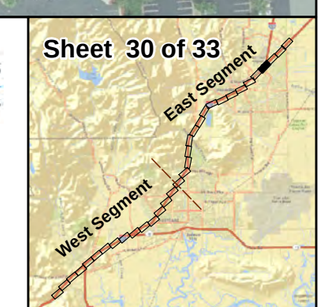

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Project Boundary

Project Impacts

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Land Cover

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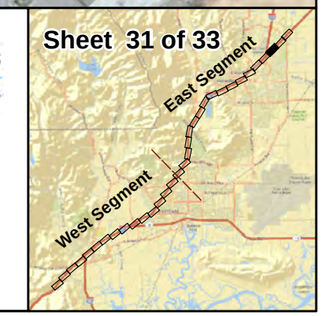

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

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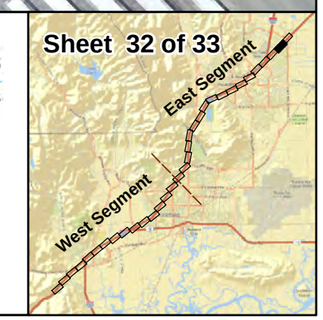

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Project Boundary

Project Impacts

- Permanent
- Temporary

Land Cover

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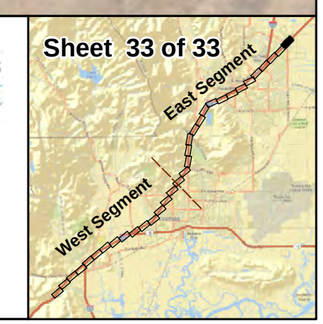

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APPENDIX I

Special Status Wildlife Species with Potential to Occur within the Biological Study Area

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Table 6: Listed and Proposed Species and Critical Habitat Potentially Occurring or Known to Occur in the BSA.

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
Federal or State Endangered, Rare, or Threatened Species					
Lange's metalmark butterfly	*Apodemia mormo langei*	FE	Sand dunes; closely associated with naked buckwheat (*Eriogonum nudum*).	A	Suitable habitat is not present and the BSA is outside the species' known range.
Callippe silverspot butterfly	*Speyeria zerene myrtleae*	FE	Grasslands; closely associated with *Viola pedunculata*.	A	Species is not expected to breed in the BSA as botanical surveys (CCCI 2012a) did not identify any *Viola pedunculata*, the larval host plant.
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE	Coastal dune or prairie habitat; closely associated with violets (*Viola* spp.).	A	Botanical surveys (CCCI 2012a) did not identify any violets, the larval host plant, in the BSA and the BSA is outside the species' known range.
Conservancy fairy shrimp	*Branchinecta conservation*	FE	Highly turbid, large vernal pools.	HP/SA	Wet-season and dry-season sampling of potentially suitable seasonal wetlands in the BSA detected no conservancy fairy shrimp (CCCI 2013a and b).
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE	Grass or mud-bottomed swales in grasslands on old alluvial soils underlain by hardpan.	HP/SA	Wet-season and dry-season sampling of potentially suitable seasonal wetlands in the BSA detected no vernal pool tadpole shrimp (CCCI 2013a and b).
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	Vernal pool crustaceans live in vernal pools, swales, and ephemeral freshwater habitats. None are known to occur in riverine waters or marine waters.	HP/SA	Wet-season and dry-season sampling of potentially suitable seasonal wetlands in the BSA detected no vernal pool fairy shrimp (CCCI 2013a and b).
California freshwater shrimp	*Syncaris pacifica*	FE	Low elevation, perennial freshwater streams within Marin, Sonoma, and Napa counties.	A	BSA is not within the species' known range.

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	Elderberry trees in the Central Valley.	HP	Suitable habitat (i.e., elderberry shrubs) is present in the BSA (CCCI 2012a) and the species has been documented approximately 0.05 mi north of the BSA (CNDDB 2014).
Central Valley spring-run Chinook salmon	*Oncorhynchus tshawytscha*	FT, ST	Spawn and rear in main-stem Sacramento River and suitable perennial tributaries. Require cool year-round water temperatures and deep pools for over-summering habitat. Spawn in riffles with gravel and cobble substrate.	A	BSA is not within the species' known distribution.
Winter-run Chinook salmon	*Oncorhynchus tshawytscha*	FE, SE	Cool streams that reach the ocean and that have shallow, partly shaded pools and clear-water sandstone depression pools.	A	BSA is not within the species' known distribution.
Central Valley steelhead	*Oncorhynchus mykiss*	FT	Spawns in cool, moderately fast flowing water with gravel bottom.	HP	The Central Valley steelhead range overlaps the northeastern-most portion of the BSA (i.e., Ulatis and Alamo Creeks), and a winter steelhead distribution map produced by the CDFW (2014) indicates that anadromous steelhead were observed in 2004 in Alamo Creek and Ulatis Creek.

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
Central California Coast steelhead	*Oncorhynchus mykiss*	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	HP	The Central California Coast steelhead range overlaps all but the northeastern-most portion of the BSA, and a winter steelhead distribution map produced by the CDFW (2014) indicates that anadromous steelhead were observed in 2004 in Jameson Canyon Creek, Green Valley Creek, and Suisun Valley Creek. Leidy, reports steelhead being observed in Green Valley Creek and Suisun Valley Creek, with observations being made at several locations upstream of I-80 on Green Valley Creek (Leidy et al. 2005, LSA Associates 2008).
Central California Coast coho salmon	*Oncorhynchus kisutch*	FE, SE	Open ocean, estuaries, and rivers.	A	BSA is not within the species' known range.
Green sturgeon	*Acipenser medirostris*	FT, CSSC	This DPS includes green sturgeon that spawn in rivers south of the Eel River. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	Suitable habitat is not present in the BSA.
Delta smelt	*Hypomesus transpacificus*	FT, ST	Brackish water habitats along coast, fairly still but not stagnant water and high oxygen levels.	A	Suitable habitat is not present in the BSA.
Tidewater goby	*Eucyclogobius newberryi*	FE, CSSC	Brackish water habitats along coast, fairly still but not stagnant water and high oxygen levels.	A	Suitable habitat is not present in the BSA.

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
California tiger salamander	*Ambystoma californiense*	FT, SE	Vernal or temporary pools in annual grasslands or open woodlands.	A	No suitable aquatic breeding habitat is present in the BSA (CCCI 2013d), and the BSA is not within the species' known distribution; nearest known record is located approximately 3.5 mi to the east (CNDDB 2014).
California red-legged frog	*Rana draytonii*	FT, CSSC	Streams, freshwater pools, and ponds with emergent or overhanging vegetation.	P	Suitable habitat is present, and an individual was observed during protocol-level red-legged frog surveys of the BSA (CCCI 2012c). Extreme southwest end of BSA is located immediately adjacent to critical habitat (i.e., units Sol-1and Sol-3).
Alameda whipsnake	*Masticophis lateralis euryxanthus*	FT, ST	Primarily associated with scrub and chaparral. Also may occur in any inner Coast Range plant community.	A	BSA is outside the species' known range.
Giant garter snake	*Thamnophis gigas*	FT, ST	Freshwater marshes and low gradient streams with emergent vegetation; adapted to drainage canals and irrigation ditches with mud substrate.	A	BSA is outside the species' known range. Although the southern portion of the BSA is near the limits of the species' range, no suitable habitat (perennial marsh or slough) that is connected hydrologically to giant garter snake populations is present in the BSA.
California least tern	*Sterna antillarum browni*	FE, SE, SP	Nests along the coast on bare or sparsely vegetated, flat substrates. In S.F. Bay, nests in salt pannes and on an old airport runway. Forages for fish in open waters.	A	Suitable habitat is not present in the BSA.

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
California clapper rail	*Rallus longirostris obsoletus*	FE, SE, SP	Salt marsh habitat dominated by pickleweed and cordgrass.	A	Suitable marsh habitat is not present in the BSA; nearest record is located approximately 3.3 mi to the southeast (CNDDB 2014).
Western snowy plover	*Charadrius alexandrinus nivosus*	FT, CSSC	Sandy beaches on marine and estuarine shores and salt pans in San Francisco Bay saline managed ponds.	A	Species is rare in Solano County (no CNDDB records are present [CNNDB 2014]) and suitable habitat is not present in the BSA.
California black rail	*Laterallus jamaicensis coturniculus*	ST	Coastal and inland marsh habitat, nests primarily in pickleweed-dominated marshes.	A	Suitable marsh habitat is not present in the BSA; nearest record is located approximately 1.8 mi to the southeast (CNDDB 2014).
Swainson's hawk	*Buteo swainsoni*	ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah; forages in adjacent livestock pasture, grassland, or grain fields.	P	Suitable nesting and foraging habitat is present in the BSA and the species was recorded nesting within the BSA, north of Cherry Glen Road, in 2005 and in eucalyptus trees bordering Pine Tree Creek in 1996 through 2006 (CNDDB 20104).
Bald eagle	*Haliaeetus leucocephalus*	SE, SP	Occurs mainly along seacoasts, rivers, and lakes; nests in tall trees or on cliffs, occasionally on electrical towers. Feeds mostly on fish.	A	Species has not been recorded breeding in Solano County and no suitable nesting habitat is present in the BSA.
Northern spotted owl	*Strix occidentalis caurina*	FT	Dense, multi-layered mixed conifer, redwood, and Douglas-fir habitats with large overstory trees.	A	No suitable habitat is present and no CNDDB records occur within 10 mi of the BSA.
Bank swallow	*Riparia riparia*	ST (nesting)	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	A	Suitable habitat is not present in the BSA and the nearest recorded occurrence is located over 12 mi to the west (CNDDB 2014).

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
Willow flycatcher	*Empidonax traillii*	SE (nesting)	Breeds locally in riparian habitats in mountains and southern deserts.	A	This species occurs as an uncommon migrant in the project vicinity. However, migrant willow flycatchers occurring in the BSA are likely from breeding populations outside the state, and, thus, would not be individuals from the state-listed California population or the federally listed subspecies extimus that resides in riparian habitat of southern California (Unitt 1987).
Salt marsh harvest mouse	*Reithrodontomys raviventris*	FE, SE, SP	Salt marsh habitat dominated by common pickleweed.	A	Suitable salt or brackish marsh habitat not present in the BSA.
California Species of Special Concern					
River lamprey	*Lampetra ayresi*	CSSC	Spawn in freshwater rivers and streams with juveniles found in slow-moving current, silty bottom habitats; metamorphosed juveniles migrate through estuaries to the ocean.	A	BSA is outside the species' known range (University of California Davis 2014).
Sacramento splittail	Pogonichthys macrolepidotus	CSSC	Shallow, dead-end sloughs with submerged vegetation and backwater slough areas in the lower delta. Prefer low-salinity, shallow water areas.	A	Suitable habitat is not present in the BSA.
Central Valley fall-run Chinook salmon	*Oncorhynchus tshawytscha*	CSSC	Spawn and rear in the main-stem Sacramento River and suitable perennial tributaries. Require cool year-round water temperatures and deep pools for over-summering habitat. Spawn in riffles with gravel and cobble substrate.	HP	The species has been documented within several drainages that run through the BSA (LSA Associates 2008).

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
Foothill yellow-legged frog	*Rana boylii*	CSSC	Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.	A	Suitable habitat not present in the BSA.
Western pond turtle	*Actinemys marmorata*	CSSC	Permanent or nearly permanent water in a variety of habitats.	P	Suitable habitat is present in the BSA and the species was observed during surveys of the site.
Mountain plover	*Charadrius montanus*	CSSC (wintering)	Short grass habitats or their equivalents.	A	Nearest known occurrence is over 10 mi east of the BSA and high quality wintering habitat is not present.
Northern harrier	*Circus cyaneus*	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	HP	Grasslands and agricultural fields in and adjacent to the BSA provide suitable nesting and foraging habitat.
Short-eared owl	*Asio flammeus*	CSSC (nesting)	Nests on ground in tall emergent vegetation or grasses, forages over a variety of open habitats.	HP	Suitable wintering habitat is present in the BSA; however, the only known breeding population in the region occurs at the Grizzly Island Wildlife Area (Roberson 2008) and the species is not expected to breed in the BSA.
Long-eared owl	*Asio otus*	CSSC (nesting)	Riparian bottomlands with tall, dense willows and cottonwood stands (also dense live oak and California Bay along upland streams); forages primarily in adjacent open areas.	A	Suitably large areas of dense riparian habitat are not present in the BSA.
Burrowing owl	*Athene cunicularia*	CSSC	Open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels.	HP	Suitable habitat is present and the species was recorded within the northern-most portion of the BSA in 2005 (CNDDB 2014).
Loggerhead shrike	*Lanius ludovicianus*	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	P	Suitable habitat is present and the species was observed during surveys of the BSA (CCCI 2014).

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	CSSC	Nests in herbaceous vegetation, usually in wetlands or moist floodplains.	A	BSA is outside the species' known range.
Yellow warbler	*Setophaga petechia*	CSSC (nesting)	Nests in riparian woodlands.	A	BSA is outside the species' known range (Heath 2008).
Tricolored blackbird	*Agelaius tricolor*	CSSC (nesting colony)	Nests near fresh water in dense emergent vegetation.	HP	Suitable nesting and foraging habitat is present in the BSA.
Suisun song sparrow	*Melospiza melodia maxillaris*	CSSC	Nests and forages in tidal marshes in Suisun Bay.	A	Tidal marsh habitat is not present in the BSA.
Grasshopper sparrow	*Ammodramus savannarum*	CSSC (nesting)	Nests and forages in extensive open grasslands, meadows, fallow fields, and pastures.	HP	Grasslands within the BSA provide suitable nesting and foraging habitat.
Suisun shrew	*Sorex ornatus sinuosus*	CSSC	Tidal and brackish marshes along the north shore of San Pablo and Suisun bays.	A	Suitable salt or brackish marsh habitat not present in the BSA.
Pallid bat	*Antrozous pallidus*	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	HP	Eight bridges within the BSA provide suitable roosting habitat. Although no pallid bats were detected during focused surveys of these structures (CCCI 2013c), the surveys were conducted outside the maternity season.
Townsend's big-eared bat	*Corynorhinus townsendii*	SC, CSSC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats.	P	Suitable roosting habitat is not present in the BSA; however, the species may forage over the BSA and was detected during focused bat surveys of the area (CCCI 2013c).
Western red bat	*Lasiurus blossevillii*	CSSC	Roosts in foliage in forest or woodlands, especially in or near riparian habitat.	P	Species was detected at three locations within the BSA during focused surveys for bats (CCCI 2013c).

Common Name	Scientific Name	*Status	General Habitat Description	Habitat Present/ Absent	Rationale
American badger	*Taxidea taxus*	CSSC	Burrows in grasslands and occasionally in infrequently disked agricultural areas.	HP	Suitable habitat is present in the BSA and surrounding vicinity, as evidenced by the observation of a roadkill individual within the BSA during surveys of the site (2014).
State Fully Protected Species					
California brown pelican	*Pelecanus occidentalis californicus*	SP (nesting colony and communal roosts)	Undisturbed islands near estuarine, marine, subtidal, and marine pelagic waters.	A	Suitable habitat is not present in the BSA.
White-tailed kite	*Elanus leucurus*	SP	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	P	Suitable nesting and foraging habitat is present and the species was observed during surveys of the BSA (CCCI 2014).
American peregrine falcon	*Falco peregrinus anatum*	SP	Forages in many habitats; nests on cliffs and tall bridges and buildings.	HP/SA	Suitable nesting habitat is not present in the BSA and peregrine falcons are not expected to forage in the BSA due to the proximity of I-80.
Golden eagle	*Aquila chrysaetos*	SP	Breeds on cliffs or in large trees (rarely on electrical towers), forages in open areas.	HP/SA	Suitable nesting habitat is not present in the BSA and golden eagles are not expected to forage in the BSA due to the proximity of I-80. Nearest CNDDB (2014) occurrence is approximately 3.4 mi to the southeast.

Key to Table Abbreviations: Absent [A] - no habitat present and no further work needed. Habitat Present/Species Absent [HP/SA] - site conditions consistent with suitable habitat, but for other reasons (e.g., negative focused surveys for species, level of disturbance), the species is not expected to occur. Habitat Present [HP] - habitat is, or may be present. The species may be present.

Status: Federal Endangered (FE); Federal Threatened (FT); Federal Candidate (FC); State Endangered (SE); State Threatened (ST); State Protected (SP); State Rare (SR); State Candidate; California Species of Special Concern (CSSC); California Native Plant Society (CNPS).

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APPENDIX J

USFWS Species List

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2015-SLI-0719 June 19, 2015
Event Code: 08ESMF00-2015-E-02495
Project Name: I-80 Express Lanes Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead. Please visit our office's website (http://www.fws.gov/sacramento) to view a map of office jurisdictions.

Lead FWS offices by County and Ownership/Program

County	Ownership/Program	Species	Office Lead*
Alameda	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Alameda	All ownerships but tidal/estuarine	All	SFWO
Alpine	Humboldt Toiyabe National Forest	All	RFWO
Alpine	Lake Tahoe Basin Management Unit	All	RFWO
Alpine	Stanislaus National Forest	All	SFWO
Alpine	El Dorado National Forest	All	SFWO
Colusa	Mendocino National Forest	All	AFWO
Colusa	Other	All	By jurisdiction (see map)
Contra Costa	Legal Delta (Excluding ECCHCP)	All	BDFWO
Contra Costa	Antioch Dunes NWR	All	BDFWO
Contra Costa	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Contra Costa	All ownerships but tidal/estuarine	All	SFWO

El Dorado	El Dorado National Forest	All	SFWO
El Dorado	LakeTahoe Basin Management Unit		RFWO
Glenn	Mendocino National Forest	All	AFWO
Glenn	Other	All	By jurisdiction (see map)
Lake	Mendocino National Forest	All	AFWO
Lake	Other	All	By jurisdiction (see map)
Lassen	Modoc National Forest	All	KFWO
Lassen	Lassen National Forest	All	SFWO
Lassen	Toiyabe National Forest	All	RFWO
Lassen	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Lassen	BLM Alturas Resource Area	All	KFWO
Lassen	Lassen Volcanic National Park	All (includes Eagle Lake trout on all ownerships)	SFWO
Lassen	All other ownerships	All	By jurisdiction (see map)

Marin	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Marin	All ownerships but tidal/estuarine	All	SFWO
Mendocino	Russian River watershed	All	SFWO
Mendocino	All except Russian River watershed	All	AFWO
Napa	All ownerships but tidal/estuarine	All	SFWO
Napa	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Nevada	Humboldt Toiyabe National Forest	All	RFWO
Nevada	All other ownerships	All	By jurisdiction (See map)
Placer	Lake Tahoe Basin Management Unit	All	RFWO
Placer	All other ownerships	All	SFWO
Sacramento	Legal Delta	Delta Smelt	BDFWO
Sacramento	Other	All	By jurisdiction (see map)
San Francisco	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO

San Francisco	All ownerships but tidal/estuarine	All	SFWO
San Mateo	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Mateo	All ownerships but tidal/estuarine	All	SFWO
San Joaquin	Legal Delta excluding San Joaquin HCP	All	BDFWO
San Joaquin	Other	All	SFWO
Santa Clara	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
Santa Clara	All ownerships but tidal/estuarine	All	SFWO
Shasta	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Shasta	Hat Creek Ranger District	All	SFWO
Shasta	Bureau of Reclamation (Central Valley Project)	All	BDFWO
Shasta	Whiskeytown National Recreation Area	All	YFWO
Shasta	BLM Alturas Resource Area	All	KFWO

Shasta	Caltrans	By jurisdiction	SFWO/AFWO
Shasta	Ahjumawi Lava Springs State Park	Shasta crayfish	SFWO
Shasta	All other ownerships	All	By jurisdiction (see map)
Shasta	Natural Resource Damage Assessment, all lands	All	SFWO/BDFWO
Sierra	Humboldt Toiyabe National Forest	All	RFWO
Sierra	All other ownerships	All	SFWO
Solano	Suisun Marsh	All	BDFWO
Solano	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Solano	All ownerships but tidal/estuarine	All	SFWO
Solano	Other	All	By jurisdiction (see map)
Sonoma	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Sonoma	All ownerships but tidal/estuarine	All	SFWO
Tehama	Mendocino National Forest	All	AFWO
	Shasta Trinity National Forest		

Tehama	except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Tehama	All other ownerships	All	By jurisdiction (see map)
Yolo	Yolo Bypass	All	BDFWO
Yolo	Other	All	By jurisdiction (see map)
All	FERC-ESA	All	By jurisdiction (see map)
All	FERC-ESA	Shasta crayfish	SFWO
All	FERC-Relicensing (non-ESA)	All	BDFWO
***Office Leads:**			
AFWO=Arcata Fish and Wildlife Office			
BDFWO=Bay Delta Fish and Wildlife Office			
KFWO=Klamath Falls Fish and Wildlife Office			
RFWO=Reno Fish and Wildlife Office			
YFWO=Yreka Fish and Wildlife Office			

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: I-80 Express Lanes Project

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

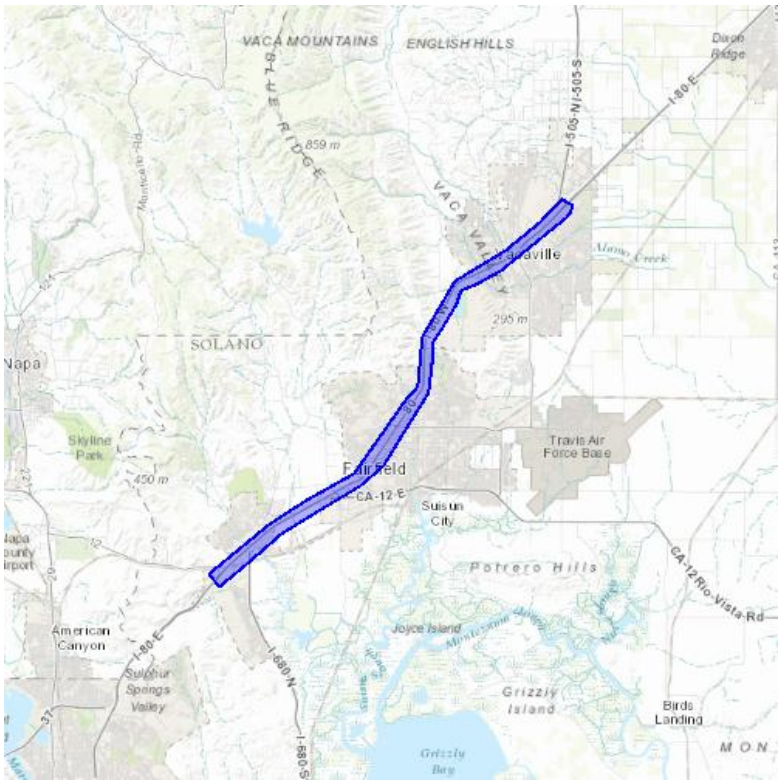
Consultation Code: 08ESMF00-2015-SLI-0719
Event Code: 08ESMF00-2015-E-02495

Project Type: TRANSPORTATION

Project Name: I-80 Express Lanes Project
Project Description: The Solano Transportation Authority and Bay Area Infrastructure Finance Authority, in cooperation with the California Department of Transportation and Federal Highway Administration, propose to provide express lanes in both eastbound and westbound directions on Interstate 80 (I-80) from west of Red Top Road to east of Interstate 505 (I-505) in Solano County, California. Because of funding limitations, it is likely that the project would be constructed in two phases.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-122.12574005126953 38.22766257971721, -122.1617889404297 38.203925106578744, -122.15595245361328 38.19852914647375, -122.1401596069336 38.20878112874008, -122.11921691894531 38.22334725146838, -122.09896087646484 38.23224733547971, -122.07149505615233 38.245460602625116, -122.05810546875 38.25516677887637, -122.04505920410156 38.27134085856101, -122.0309829711914 38.28858924073601, -122.02789306640625 38.30718056188316, -122.02789306640625 38.313107227858886, -122.02239990234375 38.31903340948611, -122.01416015625 38.330076364552255, -122.01141357421875 38.33707834236628, -122.00248718261717 38.33977123059308, -121.9873809814453 38.346233753949086, -121.94892883300781 38.37046308118119, -121.94618225097656 38.373423887267386, -121.94515228271484 38.376653719374936, -121.95133209228517 38.37961427214941, -121.96506500244139 38.36857886877816, -121.98497772216797 38.35538800838217, -122.01553344726561 38.34138691548408, -122.03475952148436 38.314723507247336, -122.03716278076172 38.29155339372579, -122.04471588134767 38.28535548122145, -122.07492828369139 38.25112269630296, -122.10514068603514 38.23791045828497, -

122.12574005126953 38.22766257971721)))

Project Counties: Solano, CA

Endangered Species Act Species List

There are a total of 25 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	**Status**	**Has Critical Habitat**	**Condition(s)**
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated	
California tiger Salamander *(Ambystoma californiense)* Population: U.S.A. (Central CA DPS)	Threatened	Final designated	
Birds			
California Clapper rail *(Rallus longirostris obsoletus)* Population: Entire	Endangered		
California Least tern *(Sterna antillarum browni)*	Endangered		
Northern Spotted owl *(Strix occidentalis caurina)* Population: Entire	Threatened	Final designated	
western snowy plover *(Charadrius nivosus ssp. nivosus)* Population: Pacific coastal pop.	Threatened	Final designated	

Crustaceans			
California Freshwater shrimp *(Syncaris pacifica)* Population: Entire	Endangered		
Conservancy fairy shrimp *(Branchinecta conservatio)* Population: Entire	Endangered	Final designated	
Vernal Pool fairy shrimp *(Branchinecta lynchi)* Population: Entire	Threatened	Final designated	
Vernal Pool tadpole shrimp *(Lepidurus packardi)* Population: Entire	Endangered	Final designated	
Fishes			
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated	
steelhead *(Oncorhynchus (=salmo) mykiss)* Population: Northern California DPS	Threatened	Final designated	
Flowering Plants			
Contra Costa goldfields *(Lasthenia conjugens)*	Endangered	Final designated	
San Joaquin Orcutt grass *(Orcuttia inaequalis)*	Threatened	Final designated	
Santa Cruz tarplant *(Holocarpha macradenia)*	Threatened	Final designated	
Showy Indian clover *(Trifolium*	Endangered		

amoenum)			
Soft bird's-beak *(Cordylanthus mollis ssp. mollis)*	Endangered	Final designated	
Suisun thistle *(Cirsium hydrophilum var. hydrophilum)*	Endangered	Final designated	
Tiburon paintbrush *(Castilleja affinis ssp. neglecta)*	Endangered		
Insects			
Callippe Silverspot butterfly *(Speyeria callippe callippe)* Population: Entire	Endangered		
Delta Green Ground beetle *(Elaphrus viridis)* Population: Entire	Threatened	Final designated	
San Bruno Elfin butterfly *(Callophrys mossii bayensis)* Population: Entire	Endangered		
Valley Elderberry Longhorn beetle *(Desmocerus californicus dimorphus)* Population: Entire	Threatened	Final designated	
Mammals			
Salt Marsh Harvest mouse *(Reithrodontomys raviventris)* Population: U.S.A.(CA)	Endangered		
Reptiles			
Giant Garter snake *(Thamnophis gigas)* Population: Entire	Threatened		

Critical habitats that lie within your project area

The following critical habitats lie fully or partially within your project area.

Amphibians	Critical Habitat Type
California red-legged frog *(Rana draytonii)* Population: Entire	Final designated

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APPENDIX K

Draft NRCS-CPA-106

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request / 4. Sheet 1 of _____
1. Name of Project: I-80 Express Lane Project	5. Federal Agency Involved: Caltrans, District 4
2. Type of Project: Interstate Highway Improvement	6. County and State: Solano County, California

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated / Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment _____			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	0.01			
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor	1561.9			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	2			
2. Perimeter in Nonurban Use	10	1			
3. Percent Of Corridor Being Farmed	20	20			
4. Protection Provided By State And Local Government	20	20			
5. Size of Present Farm Unit Compared To Average	10	0			
6. Creation Of Nonfarmable Farmland	25	0			
7. Availablility Of Farm Support Services	5	4			
8. On-Farm Investments	20	10			
9. Effects Of Conversion On Farm Support Services	25	0			
10. Compatibility With Existing Agricultural Use	10	1			
TOTAL CORRIDOR ASSESSMENT POINTS	160	58	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	58	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	58	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ?
(Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

Question

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

Answer

Placed a land use study area map on a 1 mile grid using the scale. Counted the undeveloped vs developed 1 mile blocks to determine the percentage.

Developed 1 mile blocks	38
Undeveloped 1 mile blocks	16
Total	**54**
Percent	**29.63%**

Scoring

0	< 20%
1	25%
2	30.0%
3	35.0%
4	40.0%
5	45.0%
6	50.0%
7	55.0%
8	60.0%
9	65.0%
10	70.0%
11	75.0%
12	80.0%
13	85.0%
14	90.0%
15	90+%

Final Score **2 points**

Question

(2) How much of the perimeter of the site borders on land in nonurban use?

More than 90 percent - 10 points

90 to 20 percent - 9 to 1 point(s)

Less than 20 percent - 0 points

Answer

Multiplied the 18 mile corridor by 2 to make the perimeter of 36 miles. Determined amount miles using the scale that are undeveloped on the land use map in the northbound/southbound directions. Divided number into total to determine the percent.

Estimated urban miles	26
Estimated nonurban miles	10
Total Miles	**36**
Percent nonurban	27.78%

Scoring

0	< 20%
1	27%
2	34.00%
3	41.00%
4	48.00%
5	55.00%
6	62.00%
7	69.00%
8	76.00%
9	83.00%
10	90+%

Final Score **1 points**

Question

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?

More than 90 percent - 20 points

90 to 20 percent - 19 to 1 point(s)

Less than 20 percent - 0 points

Answer

compared the solano FMMP 2006 to the current 2010 for example. Also look at aerial google earth files from the past 10 years. These areas appear to have been continuously cultivated/set aside as Prime Farmland for the past several years.

Scoring		
	0	< 20%
	1	24%
	2	27.20%
	3	30.80%
	4	34.40%
	5	38.00%
	6	41.60%
	7	45.20%
	8	48.80%
	9	52.40%
	10	56.00%
	11	59.60%
	12	63.20%
	13	66.80%
	14	70.40%
	15	74.00%
	16	77.60%
	17	81.20%
	18	84.80%
	19	88.40%
	20	90+%
Final Score	20 points	

Question

4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?

Site is protected - 20 points

Site is not protected - 0 points

Answer

all prime farmland, impacted by the project, is protected

Final Score 20 points

Question

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ?

(Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)

As large or larger - 10 points

Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

Answer

looked at solano average farm size census data 1997 = 455 acres. Then compared the parcel size in acres of each affected prime farmland parcel to the Solano County Average. None are above 5 percent.

Affected Parcels	Parcel Size (acres)	Solano Av (acres)	percent
0027-510-180	4.23	455	0.93%
0127-030-010	2.12	455	0.47%

Final Score 0 points

Question

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?

Acreage equal to more than 25 percent of acres directly converted by the project - 25 points

Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)

Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

Answer

Determined the size of the farmland take and compared to the overall parcel size in acres. Little to None of the remaining land is estimated to be unfarmable.

Affected Parcels	Parcel Size (acres)	Take (acre)	
0027-510-180	4.23	0.01	0.24%
0127-030-010	2.12	0.0103	0.49%

Final Score 0 points

Question

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?

All required services are available - 5 points

Some required services are available - 4 to 1 point(s)

No required services are available - 0 points

Answer

aerial assessment via google earth shows access to roads, storage,barns,etc. Most services required are available

Final Score 4 points

Question

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?

High amount of on-farm investment - 20 points

Moderate amount of on-farm investment - 19 to 1 point(s)

No on-farm investment - 0 points

Answer

aerial assessment via google earth shows access to roads, storage,barns,etc. There appears to be a moderate amount of existing on-farm investments on farmland sites.

Final Score 10 points

Question		
(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area? Substantial reduction in demand for support services if the site is converted - 25 points Some reduction in demand for support services if the site is converted - 1 to 24 point(s) No significant reduction in demand for support services if the site is converted - 0 points		
Answer		
takes are limited would not disturb existing farm infrastrucure to the extent of affecting the local farm economy.	**Final Score**	0 points

Question		
(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use? Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s) Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points		
Answer		
as with existing roadway, proposed project brings paved capacity and potential runoff; however, farmland is already adjacent to I-80 corridor. The proposed project would not change to farmland area to an extent that would drastically alter existing conditions.	**Final Score**	1 points

APPENDIX L

Wetland Report and USACE Submission

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
111 GRAND AVENUE
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OAKLAND, CA 94623-0660
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TTY (800) 735-2929
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Flex your power!
Be energy efficient!

October 29, 2014

Jane Hicks
Chief, Regulatory Division
Department of the Army
San Francisco District
1455 Market Street, 16th Floor
San Francisco, California 94103-1398

Attn: Ms. Holly Costa

Dear Ms. Hicks,

The California Department of Transportation (Caltrans) is submitting completed Wetland Delineation Report for the Interstate 80 Express Lanes project (EA 04-4G0800). Caltrans will be also be submitting the complete Individual Permit Application for the I-80 Express Lanes Project in the near future.

Please feel free to contact me if you have any questions at (510) 286-7185.

Sincerely,

Christopher States
Senior Biologist
Office of Biological Sciences and Permits

Enclosures:
I-80 Express Lanes Wetland Delineation Report

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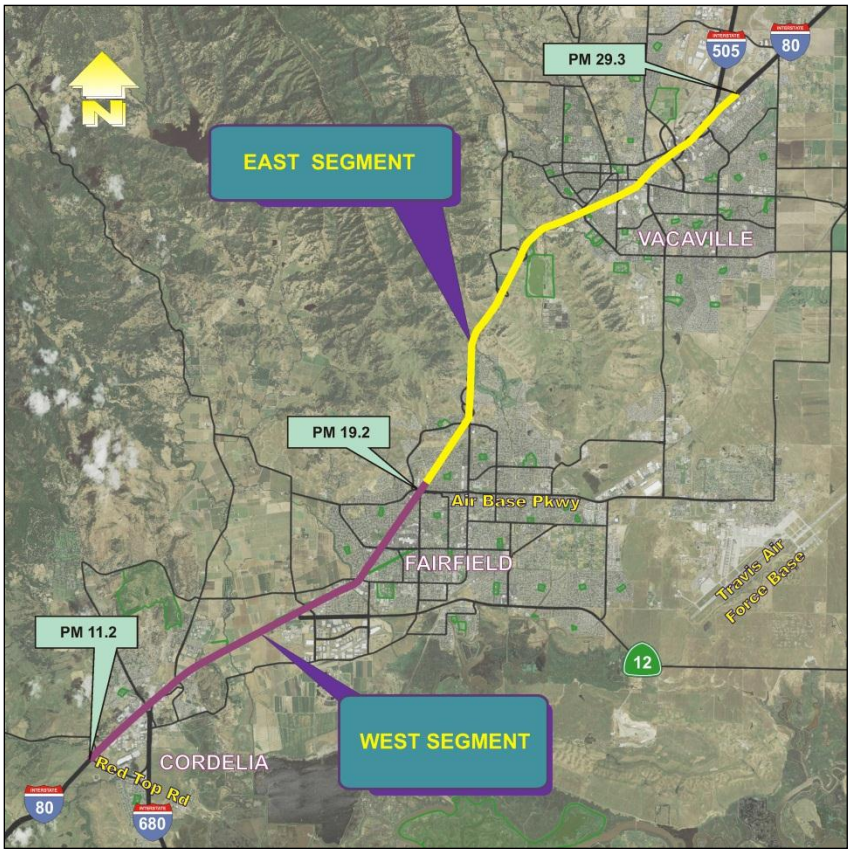
04-SOL-80 PM 11.2/29.3
EA 04-4G0800
Project ID 0412000332

WETLAND DELINEATION REPORT

I-80 EXPRESS LANES PROJECT

from Red Top Road to I-505
in Solano County



Prepared for:

Solano Transportation Authority

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Dated: May 2014

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WETLAND DELINEATION REPORT

FOR THE

INTERSTATE 80 EXPRESS LANES PROJECT

Red Top Road to I-505

SOL-80 PM 11.2/29.3

EA 04-4G0800/ Project ID 0412000332

May 2014

U.S. DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA
and
Solano County Transportation Authority

Prepared By: Ted Robertson Date: 5/23/2014

Ted Robertson, Staff Biologist
(925) 335-9308
Condor Country Consulting, Inc.

Reviewed By: Janet Adams Date: 5/28/2014

Janet Adams, Deputy Executive Director/Director of Projects
(707) 424-6010
Solano Transportation Authority

Approved By: Date: 5.28.14

Christopher States, District Branch Chief, Senior Biologist
(510) 286-7185
California Department of Transportation, District 4

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Appendix A - Assessor Parcel Numbers and Location Maps

Appendix B - National Wetland Inventory Maps of Project Area

Appendix C - Natural Resources Conservation Service Web Soil Survey Maps

Appendix D - Plant Species Observed in Project Area

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Appendix F - Wetland Determination Sampling Point Data Forms

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Appendix H - Representative Site Photos

Exhibit 1 - WETS Tables for Project Area

Table 1 - Soil Types Occurring within the Project Area

Table 2 - Wetland Feature Acreages and Status within the Project Area, Organized by Wetland Type

Figure 1 - Project Area

Acronyms and Abbreviations

ACOE	U.S. Army Corps of Engineers
CCCI	Condor Country Consulting, Inc.
CEQA	California Environmental Quality Act
CWA	Clean Water Act
GPS	Global Positioning System
HCP	Habitat Conservation Plan
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
OW	Other Waters
PM	Perennial Marsh
PWD	Perennial Wetland Drainage
RWQCB	Regional Water Quality Control Board
RPW	Relatively Permanent Waters
SW	Seasonal Wetland
TNW	Traditional Navigable Waters
TOB	Top of Bank

1.0 Summary

This wetlands and waters delineation and assessment was conducted along the site of the proposed I-80 Express Lanes Project for the Solano County Transportation Authority ("Authority"). The purpose of the project is to provide an eastbound and westbound express lane on Interstate 80 (I-80) along the approximately 17-mile section, between Red Top Road and the Interstate 505 (I-505) interchange. This will be accomplished by a combination of converting existing high-occupancy vehicle (HOV) lanes to express lanes and expanding the road into the median, or outward from the existing edge-of-pavement, in order to accommodate the express lanes, and the buffer between the new lane and the mixed-use lanes. The express lanes are expected to improve the traffic flow through this heavily-used, congested area, encourage ride sharing, and allow commuters to pay for faster transit during peak highway use periods.

The project area covered in this report incorporates I-80 from Red Top Road east to the I-505 interchange. From April through September 2011, Condor Country Consulting, Inc. (CCCI) performed wetlands and waters delineation for the both the East and West Segment of the project (from Red Top Road to the I-80/505 interchange). Project area boundaries extend 30 to 650 feet from the existing edge of pavement. This report presents the findings of the CCCI 2011 wetlands and waters investigation.

The project area is located in the Suisun Bay and Valley Putah-Cache hydrologic units of the Lower Sacramento and Suisun Bay watersheds, respectively. Land cover in the project area is a mixture of annual grasslands, fallow and active agricultural fields, perennial and seasonal wetlands, riparian woodlands, and urban development (roads, parking lots, commercial, and residential buildings). Twenty-seven soil types occur in the project area, ranging from steeply sloped, well-drained loams to flat, poorly-drained, hydric clay soils. Water flows through the project area in a network of perennial and ephemeral drainages and creeks. A matrix of ditches and culverts directs surface water runoff away from and/or under the interstate.

Numerous potential wetlands and hydrologic features were identified within the project area, including 14 seasonal wetlands, 7 perennial wetland drainages, 1 perennial marsh, 12 named creeks, 3 unnamed perennial drainages, the Putah South Canal, 225 seasonal/ephemeral drainages (33 of which are considered non- jurisdictional), and 356 culverts. Where applicable, CCCI personnel delineated wetlands in accordance with guidance manuals (Environmental Laboratory 1987, ACOE 2008a), and all features (regardless of jurisdiction) were mapped to sub-meter accuracy using a GPS unit. A total of 0.72 acres of perennial marsh, 6.08 acres of perennial wetland drainages, 1.76 acres of seasonal wetland, 4.87 acres of riparian forest/scrub, and 5.80 acres of seasonal drainages were delineated within the project area.

The potential seasonal wetlands identified in the project area typically occur in roadside ditches and in low-lying areas in meadows and fields adjacent to I-80. Nineteen of these wetlands are hydrologically connected to relatively permanent waters (RPW) through drainages and culverts associated with I-80. Perennial wetland features are generally larger, linear wetlands in drainages and sloped areas adjacent to I-80. These features convey water during periods of high flow and support perennial hydrophytic vegetation, such as cattails and bulrush. A 0.72 acre perennial marsh was identified in the Eastern Segment of the project area. Portions of this feature extend past the project area boundary, so the actual area of this feature is larger than what

was delineated. The feature lies 0.5 miles west of Cherry Glenn Road, between I-80 and Nelson Road. Although drainage extends from this marsh, almost connecting to Lagoon Valley Lake, this marsh is primarily a flat depressional feature, and is not a continuation of a defined drainage.

For those wetlands determined jurisdictional by the ACOE, a 404 permit will likely be required; for those not considered jurisdictional by the ACOE, Waste Discharge Requirements (WDR) may still be required from the California Regional Water Quality Control Board (Central Valley and San Francisco Regions; RWQCB) under the Porter-Cologne Water Quality Control Act; and a Storm Water Control Plan may be required by the RWQCB. Under the Clean Water Act, a 401 certification issued by the RWQCB, will likely be required along with a 404 permit, to comply with state water quality standards.

2.0 Introduction

Interstate 80 has had a significant increase in use over the past 20 years due to its use as a major commute corridor between the Central Valley and the Bay Area. The Solano Transportation Authority recognizes the need for expanding I-80 to aid in faster commute times during weekdays and weekends, and the need to accommodate future traffic demands through this corridor. The interstate passes over numerous creeks and drainages, and through urban and agricultural areas with many drainage features. Therefore, there is a need for an evaluation of possible wetlands and waters of the United States that might occur within the proposed project area.

2.1 Project Background

Solano Transportation Authority's purpose within this project is to create east and westbound express lanes along I-80, between Red-Top Road and the I-505 interchange (Caltrans 2006). I-80 is an inter-regional east-west corridor that connects the San Francisco and Sacramento metropolitan areas, passing through the counties of Alameda, Contra Costa, Solano, and Yolo. The portion of I-80 through the cities of Fairfield and Vacaville is the most heavily-traveled segment of the I-80 corridor within Solano County and is utilized by commuters, public transit services, and for interstate and interregional goods movement. In addition there is significant weekend traffic through this corridor by recreation and vacation travelers between the Bay Area, the Lake Tahoe region, and other points east. Such heavy traffic through the corridor results in frequent significant congestion in the general purpose lanes, particularly acute during the peak travel hours. The level of congestion will continue to worsen as traffic demand increases in the future. The purpose of the project is to optimize and increase the capacity of the existing I-80 freeway corridor to reduce delay and meet current and future traffic demand needs.

The Solano Transportation Authority (STA) proposes to construct westbound and eastbound express lanes along approximately 17 miles of the existing I-80 corridor in Solano County. Figure 1 shows the location of the biological project area extending along I-80 from postmile 11.4 to 28.4 and passing through the cities of Fairfield and Vacaville. The project consists of two components, as described below.

The first component, the West Segment, runs along I-80 from the Red Top Road interchange (postmile 11.4) to the Air Base Parkway interchange (postmile 19.2), including the area around the I-80/I-680 interchange. In the West Segment, existing high occupancy vehicles (HOV) lanes

in both the eastbound and westbound directions would be restriped and repurposed as express lanes.

The second component, the East Segment, would construct new express lanes in both the eastbound and westbound directions of I-80 from the Air Base Parkway interchange to the I-80/I-505 interchange (postmile 28.4). The new express lanes would be constructed in the median of the I-80 freeway.

Project activities for both components would include:

- grading, paving, striping, and reconstruction or widening of existing roadways and creek bridges;
- reconstruction of a majority of the I-80 interchanges within the project area;
- reconstruction of existing sound walls and retaining walls;
- construction of new sound walls and retaining walls; and
- potential relocation and/or alteration of the median barrier along I-80.

The project may impact creeks crossed by I-80, including: Green Valley Creek Bridge, Dan Wilson Creek Bridge, Suisun Creek Bridge, Ledgewood Creek Bridge, Putah South Canal Drainage Culvert (DC), Laurel Creek DC, Alamo Creek Bridge, Ulatis Creek Bridge, Pine Tree Creek Bridge, and Horse Creek Bridge.

Portions of the West Segment have been previously delineated by Jones and Stokes (Jones and Stokes 2006 and 2008) and verified by the ACOE; however, the ACOE requires an update of locations and gaps within the project area not previously surveyed.

Figure 1

3.0 Project Setting

3.1 Location

The project area lies within Solano County, California, and spans approximately 17 miles of I-80, between Red Top Road in Fairfield and the I-505 interchange in Vacaville. The project is located on publicly and privately owned land. The westernmost point of the project area lies at 38.202038ºN, -122.157025ºW, and the easternmost point is at 38.379963ºN, -121.9447791ºW (WGS84 datum). The project area is divided into two segments. The West Segment covers 6.3 miles of I-80 and falls within the following sections: 11, 12, 13, and 24 of Township 4N, Range 3W; 6, 7, 18, and 19 and unnamed sections of Township 4N, Range 2W; and unnamed sections of Township 5N, Range 2W (Jones and Stokes 2008). The majority of the East Segment of the project falls within two land grants. The western half of the East Segment is located in the Tolenas Land Grant, a 23 square mile area located in northern Fairfield. The eastern half is located in the Los Putos Land Grant, a 65.5 square mile area encompassing Vacaville and its surrounding area. In the area where these two land grants meet, roughly in the center of the East Segment, a small amount of the project area falls within Section 36, Township 6N, and Range 2W. Assessor parcel numbers (APNs) and locations within the project area are located in Appendix A.

3.2 Hydrology & Vegetation Community

The project area lies in the Lower Sacramento and Suisun Bay Watersheds (EPA 2011). The southwest portion of the project area lies within the Suisun Bay Hydrologic Unit (Caltrans 2011). The northeast portion lies within the Valley Putah-Cache Hydrologic Unit (AES 2010). There are twelve named creeks and three unnamed perennial drainages that flow through the project area. The named creeks in the project area are (from northeast to southwest) Horse Creek, Pine Tree Creek, Ulatis Creek, Alamo Creek, Laguna Creek, Laurel Creek, Soda Springs Creek, Ledgewood Creek, Suisun Creek, Dan Wilson Creek, Green Valley Creek, and Jameson Canyon Creek. Three unnamed perennial drainages also pass through the project area. Water is present in these drainages much of the year, if not year-round, and riparian vegetation lines many of the drainages.

In addition to these features, the Putah South Canal crosses the project area twice, once about 0.33 miles north of the I-80 Allison Drive exit in Vacaville, and again 0.9 miles north of the I-80 Air Base Parkway exit near Fairfield. The 33 mile-long canal flows south, from Putah Creek in the north, to Terminal Dam in the Suisun Valley. The canal water is used for irrigation and drinking, and is owned and maintained by the Solano County Water Agency.

The Solano County Water Agency Habitat Conservation Plan (SCWA 2009) lists the Laguna and Laurel watersheds (east of I-80) as "priority watershed areas," and asserts the following:

> "Maintaining the integrity of watershed lands is critical for preserving the ecological integrity of streams. Removal of vegetation from watershed lands, particularly on steep hillsides, creates soil erosion and compaction leading to increased sedimentation in downstream watercourses. Therefore, protecting watershed areas associated with priority drainages should be a high conservation priority."

Creek and Perennial Drainage Proximity to TNWs

All creeks and drainages in the project area flow roughly from west to east, starting in the hills west of Vacaville/Fairfield. Within the project area, the creeks and perennial drainages flow into three traditional navigable waters (TNWs) of the United States, the Cache, Suisun, and Peytonia sloughs. The Rivers and Harbors Act (33 CFR Part 329.4) defines TNWs as:

> "…those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impede or destroy navigable capacity."

All three of the sloughs potentially affected by the I-80 Express Lanes project are subject to the ebb and flow of the Pacific Ocean tides through their connection to Suisun Bay, so are considered TNWs. Cache Slough, east of the project area, flows into the lower Sacramento River, which then flows into the Suisun Bay. Southwest of the project area, Suisun Slough flows into Grizzly Bay, and Grizzly Bay connects with Suisun Bay. Southwest of the project area, Peytonia Slough waters flow into Suisun Slough, and eventually into the Suisun Bay.

The creeks and perennial drainages that pass through the project area have varying proximities to Cache, Suisun, Peytonia Sloughs, but eventually all relatively permanent waters (RPW) in the project area terminate in one of the three. Horse Creek flows into Pine Tree Creek in the median of I-80, north of the I-505 interchange. Pine Tree Creek then flows 0.8 miles northeast along the median, then turn east. From there, Pine Tree Creek flows another 4.5 miles east, and converges with Ulatis Creek (1.5 miles west of Ulatis/Sweany creek junction). Ulatis Creek flows 8 miles east from the project area to Sweany Creek, where it turns southeast and continues another 8.5 miles into Cache Slough (CalFish 2012). Total distance from project area to Cache Slough is approximately 14 miles.

Alamo Creek lies in the East Segment, and Laguna Creek flows into Alamo Creek approximately 650 feet southeast of the project area. From that confluence, Alamo Creek continues another 12.5 miles east, emptying into Sweany Creek, which the flows 5.5 miles southeast into Cache Slough (CalFish 2012). The total distance to Cache Slough from the project area is 18.3 miles.

Laguna Creek flows within the east segment of project area, and then flows along the southeast side of the project area for one-half mile, where it then connects into Alamo Creek, which then continues a total of 18.8 miles into Cache Slough. Unnamed Perennial Drainage 1 flows 1,500 feet northwest from Lagoon Valley Lake, under I-80, and into Laguna Creek. Laurel Creek flows southeast from the project area 6.5 miles to the Suisun Slough. Soda Springs Creek flows 0.8 miles southwest from the project area (approximately at the mid-point of the Paradise Valley Golf Course) into Laurel Creek. From that point, Laurel Creek flows another 5 miles to the Suisun Slough. Unnamed Perennial Drainage 2 flows 3.4 miles south of the project area into Peytonia Slough. Jameson Canyon Creek flows 1.75 miles southeast into Green Valley Creek which flows another 0.25 miles South into Peytonia Slough. Dan Wilson Creek flows 1.25 miles directly southwest merging with Jameson Canyon Creek and Green Valley creek before flowing into Peytonia Slough. Unnamed Perennial Drainage 3 connects directly to Peytonia Slough as a

tributary of Green Valley Creek. Suisun Creek flows directly south over 3.5 miles into Peytonia Slough. Ledgewood Creek flows through the project area, and again under Highway 12 southeast 2 miles into Peytonia Slough (CalFish 2012).

Climate

The project area has a Mediterranean climate, with cool wet winters and hot dry summers. Average annual rainfall in the northern portion of the project area (Vacaville) is 24.5 inches, and 23.43 inches in the southern portion (Fairfield, CA) (NRCS 2011). Three weather stations were identified within the project area: Fairfield, Lake Solano, and Vacaville. Rainfall data for the project area can be found in NRCS WETS Tables (Exhibit 1). The Arid West Supplement requires that growing season length be estimated and used to evaluate various field indicators. Soil microbial growth occurs when the soil temperatures are at least 41°F (Environmental Laboratory 1987). The growing season is defined as the portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5°(C)). According to data from the Fairfield Station, the growing season for the project area is year-round, 365 days a year (NRCS 2011).

Wetlands in Vicinity of Project Area

The National Wetland Inventory's (NWI) Wetland Mapper shows one wetland within the East Segment of the project area (USFWS 2011; see Appendix B). There is a 1.603 acre Freshwater Forested/Shrub Wetland mapped between I-80 and Lagoon Valley Lake, just west of the Pena Adobe overcrossing. This wetland was identified during the CCCI delineation (feature SW-12), and re-mapped as a 1.129 acre wetland by CCCI surveyors.

According to the NWI Wetland Mapper there are 382.63 acres of Fresh Emergent Wetlands within a one-mile boundary of the entire project area. Other wetland types within the boundary include Estuarine and Marine Wetlands (1,360.37 acres) and Freshwater Forested/Shrub Wetlands (49.03).

The NWI identifies numerous wetlands, ponds, and lakes within one mile of the project area. In the Vaca Valley (East Segment of project area), the NWI shows two freshwater emergent wetlands (both under one acre) within a mile west of the east edge of the East Segment. It also maps three approximately 0.8 acre freshwater ponds within a mile east of the East Segment of the project area in the Green Tree Golf Club Golf Course. Between Vaca Valley and Lagoon Valley, approximately one-half mile north of the Pena Adobe exit on I-80, there is an 11 acre freshwater emergent wetland southeast of I-80. This wetland is approximately 75 feet southeast of the project area. There are many mapped wetlands within a mile of the project area in Lagoon Valley. There is an 8.26 acre freshwater emergent wetland 65 feet from the southwest section of the East Segment of the project area. There are three freshwater emergent wetlands (3.64, 7.83, and 0.83 acres) within a mile southeast of the East Segment of the project area. Lagoon Valley Lake, a 91 acre lake is 630 feet southeast of the project area. Two-thousand feet northwest from the Pena Adobe overcrossing there is a 4.08 acre freshwater emergent wetland in the Lagoon Valley.

A 3.55 acre freshwater emergent wetland is located 0.09 miles from the West Segment of the project area and appears to be connected to SD-310 within the project area through underground culverts northeast of Travis Boulevard. There is another large freshwater emergent wetland

(17.89 acres) located south of Suisun Valley Road, but the aerial images from the NWI Wetland Mapper indicate that this wetland does not exist anymore and has been converted into a housing development (USFWS 2011). This freshwater wetland would have then flowed into estuarine and marine wetland located 6.2 miles south of the project area and then into Suisun Slough.

There are numerous stock ponds in the hills and surrounding areas within one mile of the project area. These ponds vary in size from 0.5 to 9.6 acres, and many are connected to drainages and creeks that flow throughout the project area. The total acreage of fresh water ponds within a one mile buffer of the project area is 51.10 acres (not including Lagoon Valley Lake which is 91.49 acres).

The NWI maps do not contain information on every wetland unit within the region because many wetlands, especially seasonal or alkali wetlands and vernal pools, are smaller than the minimum mapping unit (0.25 acres and 3 acres, respectively), or were not visible in aerial photographs or other sources that were used to generate the NWI maps (USFWS 2011).

3.3 Plant Communities and Land Cover Types

The project area falls within the Sacramento Valley Sub-region of the California Floristic Province (Hickman 1993). Several vegetation/land cover types are present in the project area. Wetland and riparian habitats, while less common than upland habitats, are spread throughout the project area. Shallow inland-marsh and wet-meadow-emergent wetlands occur in depressional features, e.g., ditches. Meadows and riparian woodland/scrub communities dominate the creeks and unnamed drainages. Upland habitats are more abundant throughout the project area than wetlands, and include native and non-native grasslands, ruderal areas, urban/landscaped areas, and agricultural fields. Non-native species are denoted by an asterisk.

Ruderal

Much of the project area consists of ruderal vegetation. Ruderal vegetation often occupies disturbed vacant parcels of land and is surrounded by developed areas. This plant community usually consists of nonnative, weedy vegetation that is sparsely distributed (Holland et al. 1995). Ruderal vegetation within the project area is located along roadsides, in vegetated borders of urban development, in road cut/fill and other disturbed areas. This vegetation type is not described in Sawyer et al. (2009). Within these ruderal areas, annual grass and forb species include, but are not limited to western ragweed (*Ambrosia psilostachya*), wild oats (*Avena fatua*[*]), black mustard (*Brassica nigra*[*]), ripgut brome (*Bromus diandrus*[*]), soft brome (*Bromus hodeaceous*[*]), Italian (plumeless) thistle (*Carduus pycnocephalus*[*]), field bindweed (*Convolvulus arvensis*[*]), dove weed (*Croton setigerus*), teasel (*Dipsacus fullonum*[*]), California poppy (*Eschscholzia californica*), Mediterranean barley (*Hordeum marinum* ssp. *gussonianum*[*]), prickly lettuce (*Lactuca serriola*[*]), hare barley (*Hordeum murinum* ssp. *leporinum*[*]), Italian ryegrass (*Festuca perennis*[*]), bristly ox-tongue (*Picris echioides*[*]), wild radish (*Raphanus raphanistrum*[*]), and curly dock (*Rumex crispus*[*]).

Non-native Grassland

Much of the land cover in the project area is non-native grasslands. Within this habitat type there are several herbaceous stands with distinct species assemblages. The following herbaceous

[*] Non-native plant species

stands, described in *A Manual of California Vegetation* (Sawyer et al. 2009), occur in the project area: wild oats grasslands, annual brome grasslands, and perennial ryegrass fields. Within the East Segment, non-native grasslands occur along hillsides, roadsides, road cuts, vacant parcels, farm field edges, and fallow fields. Species common to this habitat type include common fiddleneck (*Amsinckia menziesii* var. *intermedia*), scarlet pimpernel (*Anagallis arvensis*[*]), slender wild oat[*], wild oat[*], black mustard[*], ripgut brome[*], soft brome[*], red brome (*Bromus madritensis* ssp. *rubens*[*]), Italian thistle[*], chicory (*Cichorium intybus*[*]), bindweed[*], teasel[*], barnyard grass (*Echninochloa crus-galli*[*]), wild geranium (*Geranium dissectum*[*]), Mediterranean barley[*], hare barley[*], Italian rye-grass[*], little-seed canarygrass (*Phalaris minor*[*]), bristly ox-tongue[*], rabbitfoot grass (*Polypogon monspeliensis*[*]), and curly dock[*].

Native Grassland

Many patches of native grassland occur in the project area. These patches tend to be much smaller than their non-native counterparts, and often form dense, mono-specific stands within the non-native grasslands. This habitat type consists of several distinct herbaceous stands. The following herbaceous stands, described in *A Manual of California Vegetation* (Sawyer et al. 2009), occur in the project area: meadow barley (*Hordeum brachyantherum*) patches, ashy ryegrass (*Elymus cinereus*) meadows, and creeping ryegrass (*Elymus triticoides*) tufts. The predominant species in these stands are meadow barley, ashy ryegrass, and creeping wildrye, although other species can occur in these stands. The ashy ryegrass meadows and creeping ryegrass tufts in particular have a less diverse species assemblage than the non-native grasslands, however all three vegetation types contain species found in the non-native grasslands.

Riparian Forest/Scrub

Riparian forest and scrub are found in the channels, banks, and associated upland terraces of the major streams and drainages in the project area. There are fifteen riparian corridors in the project area including ten creeks and three unnamed drainages. A total of 4.87 acres of riparian forest/scrub were mapped within the project area. This habitat type is a mixture of riparian forest and riparian scrub. The riparian forest consists of Fremont cottonwood forest, valley oak woodland, Hinds's walnut and related stands (Sawyer et al. 2009), and various assemblages of willows, Oregon ash (*Fraxinus latifolia*), and non-native riparian trees, like fig (*Ficus carica*). Riparian scrub consists of various shrubland assemblages such as coyote brush scrub and Himalayan blackberry brambles (Sawyer et al. 2009). Species common to the riparian forest and scrub communities in the East Segment include box elder (*Acer negundo*), fig, Oregon ash, toyon (*Heteromeles arbutifolia*), Northern California black walnut (*Juglans californica* var. *hindsii*), sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*), cherry plum (*Prunus cerasifera*[*]), almond (*Prunus dulcis*[*]), coast live oak (*Quercus agrifolia*), blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), black locust (*Robinia pseudoacacia*[*]), Himalayan blackberry (*Rubus discolor*[*]), blue elderberry (*Sambucus mexicana*), poison oak (*Toxicodendron diversilobum*), and California wild grape (*Vitis californica*).

Agricultural Fields

[*] Non-native plant species

Cultivated agricultural fields lie near the center of the East Segment, north of I-80. These fields are planted with annual crops, predominantly wheat. Field edges often contain non-native grassland and ruderal habitat.

Urban/Landscaped Areas

Much of the project area consists of urban areas in Fairfield and Vacaville. These developed areas include commercial buildings, residential buildings, paved streets, and parking lots. The habitat surrounding these developments, and along much of I-80, has been landscaped with an assortment of non-native trees and shrubs. These areas are typically irrigated, and the herbaceous layer is often absent (usually due to mulching or herbicide application). Common species in landscaped areas include deodar cedar (*Cedrus deodara*[*]), eucalyptus (*Eucalyptus* spp.[*]), glossy privet (*Ligustrum lucidum*[*]), oleander (*Nerium oleander*[*]), Chinese pistache (*Pistacia chinensis*[*]), callery pear (*Pyrus calleryana*[*]), California coffeeberry (*Rhamnus californica*), Indian hawthorn (*Rhaphiolepis indica*[*]), and rose (*Rosa* sp. [*]).

Wetlands

Three types of emergent wetlands occur in the project area: perennial marsh, perennial wetland drainages, and seasonal wetlands. Perennial marshes and wetland drainages are those which are wet throughout the entire year or a majority of the year. Semi-permanently inundated inland shallow fresh marshes are dominated by herbaceous perennials such as cattails and bulrushes (Cowardin et al. 1979). This wetland class has been divided into two subsets. "Perennial wetland drainages" serve as both wetland and drainage, and "perennial marshes" have perennial wetland features but do not convey water in a linear fashion. These areas are typically found in concave features such as drainage ditches, roadside ditches, and low-lying areas in meadows and fields. The second type of wetland is seasonally flooded wet meadows (seasonal wetlands, Cowardin et al. 1979). Seasonal wetland features are those which are only inundated during the rainy season and only hold water for a limited amount of time during that time and shortly after. In the project area, these wetlands occupy flat meadows, slight depressions, and ditches along I-80. Vegetation in these areas is primarily hydrophytic grasses, rushes, sedges, and forbs.

The following vegetation types occur in wetlands in the project area: iris-leaved rush seeps, pale spike rush marshes, hardstem bulrush marsh, and cattail marshes (Sawyer et al. 2009). Species commonly found in these vegetation types include broad-leaf water plantain (*Alisma plantago-aquatica*), ripgut brome[*], soft brome[*], tall flatsedge (*Cyperus eragrostis*), teasel[*], common spikerush (*Eleocharis macrostachya*), hairy willow herb (*Epilobium ciliatum*), giant horsetail (*Equisetum telmateia* ssp. *braunii*), Oregon ash, wild geranium[*], Baltic rush (*Juncus balticus*), toad rush (*Juncus bufonius*), brownhead rush (*Juncus phaeocephalus*), iris-leaved rush (*Juncus xiphioides*), broad-leaved peppergrass (*Lepidium latifolium*[*]), creeping wildrye (*Leymus triticoides*), Italian ryegrass[*], rabbitfoot grass[*], curly dock[*], hardstem bulrush (*Schoenoplectus acutus* var. *occidentalis*), narrowleaf cattail (*Typha angustifolia*), and broadleaf cattail (*Typha latifolia*).

Adjacent Land Use

The project area sits within a mixture of urban and rural land, and is held in both private and public ownership. In the urban areas, common land uses in and adjacent to the project area

[*] Non-native plant species

include high-density housing, high-density commercial/industrial buildings, city parks, bike trails, and city streets. In the less-developed, rural portions of the project area, adjacent land uses include farming, fallow fields, a golf course, and low-density residential housing.

3.4 Soils

The soils in the vicinity of the project area are a mosaic of clays, loams, clay loams, and gravelly loam (Appendix C). Landforms in the project area vary from basin floors and alluvial fans, to terraces and mountains. Steep slopes occur on road-cuts created for I-80. Slopes in the project area range from 0-50%. A total of 27 soil types occur in the project area. The hydrologic properties of these soils vary, as do their topographies. Seventeen of these soils are characterized as "well drained," five soils are "moderately well drained," and three soils are "poorly drained" or "somewhat poorly drained" (Soil Survey Staff 2011). Of the 27 listed soils, only four are listed as hydric, with hydric soil criteria values of 2B3 and 3. The Web Soil Mart describes the 2B3 hydric soil indicator as having "[s]oils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that… are poorly drained or very poorly drained and have… a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches." Soils with a hydric indicator criterion of 3 are "frequently ponded for long or very long duration during the growing season" (USDA 2007a). Table 1 summarizes the soil types and soil properties occurring within the project area.

Table 1. Soil Types Occurring within the Project Area

Map Unit Symbol[a]	Map Unit Name	Percent Slope	Drainage Type	Land Form	Hydric Soil[b]	Hydric criteria[c]	Total acres
AcC	Altamont clay	2-9	Well drained	Terraces	No	N/A	17.24
AcE	Altamont clay	9-30	Well drained	Terraces	No	N/A	16.25
AoA	Antioch-San Ysidro complex	0-2	Moderately well drained	Terraces	Yes	3	35.47
AsA	Antioch-San Ysidro complex	0-2	Moderately well drained	Terraces	No	N/A	18.52
BrA	Brentwood clay loam	0-2	Well drained	Alluvial fans	No	N/A	118.53
BrC	Brentwood clay loam	2-9	Well drained	Alluvial fans	No	N/A	0.96
Ca	Capay silty clay loam	-	Moderately well drained	Rims on basin floors	No	N/A	20.10
Cc	Capay clay	-	Moderately well drained	Rims on basin floors	Yes	2B3, 3	42.91
CeA	Clear Lake clay	0-2	Poorly drained	Basin floors	Yes	2B3, 3	90.85
CeB	Clear Lake clay	2-5	Poorly drained	Basin floors	Yes	2B3	2.32
Co	Conejo gravelly loam	-	Well drained	Alluvial fans	No	N/A	0.29
CvD2	Corning gravelly loam	2-15	Well drained	Terraces	No	N/A	11.78

Map Unit Symbol[a]	Map Unit Name	Percent Slope	Drainage Type	Land Form	Hydric Soil[b]	Hydric criteria[c]	Total acres
CvE2	Corning gravelly loam	15-30	Well drained	Terraces	No	N/A	4.26
DIE	Dibble-Los Osos clay loams	9-30	Well drained	Mountains	No	N/A	49.81
DIF2	Dibble-Los Osos clay loams	30-50	Well drained	Mountains	No	N/A	37.58
HaF	Hambright loam	15-40	Well drained	Mountains	No	N/A	0.08
Ma	Made land	-	Well drained	Alluvial fans	No	N/A	0.76
MnC	Millsholm loam	2-9	Well drained	Mountains	No	N/A	13.32
MnE	Millsholm loam	9-30	Well drained	Mountains	No	N/A	6.73
RoA	Rincon clay loam	0-2	Well drained	Alluvial fans	No	N/A	33.74
RoC	Rincon clay loam	2-9	Well drained	Alluvial fans	No	N/A	58.50
SeB	San Ysidro sandy loam	2-5	Moderately well drained	Terraces	No	N/A	0.47
Sr	Sycamore silty clay loam	-	Somewhat poorly drained	Alluvial fans	No	N/A	56.92
Ss	Sycamore silty clay loam, drained	-	Somewhat poorly drained	Alluvial fans	No	N/A	18.37
Yo	Yolo loam	-	Well drained	Alluvial fans	No	N/A	1.51
Yr	Yolo loam, clay substratum	-	Well drained	Alluvial fans	No	N/A	17.78
Ys	Yolo silty clay loam	-	Well drained	Alluvial fans	No	N/A	140.73

a: Sources: Bates 1977; U.S.D.A. 1992.

b: The hydric soil criteria are defined as follows (from U.S.D.A 1992):

c: Hydric Criteria 2B3:

2. Soils in Aquic suborder, Aquic subgroups, Albolls suborder, Salorthids great group, Pell great groups of Verticols, Pachic subgroups, or Cumulic subgroups that are:

B. poorly drained or very poorly drained and have:

3. a frequently occurring water table at less than 1.5 ft from the surface for a significant period (usually more than 2 weeks) during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches.

Hydric Criteria 3: Soils that are frequently ponded for long duration or very long duration during the growing season.

Hydric Criteria 4: Soils that are frequently flooded for long duration or very long duration during the growing season.

4.0 Methodology

4.1 Regulations

CCCI conducted a wetlands and waters delineation in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), ACOE Jurisdictional Determination Form Instructional Guidebook (ACOE 2009), and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 (September 2008). A Level 2 Onsite Inspection was conducted (as defined in the Wetland Delineation Manual), evaluating three parameters that identify and delineate the boundaries of jurisdictional wetlands including (1) the dominance of wetland vegetation, (2) the presence of hydric soils, and (3) hydrologic conditions that result in periods of inundation or saturation on the surface from flooding or ponding. The National List of Plant Species That Occur in Wetlands: California (Region 0) was used to determine the wetland indicator status of plants observed in the project site (Appendix D). The U.S. Department of Agriculture Natural Resource Conservation Service Web Soil Survey for Solano County, California, and the National List of Hydric Soils were used to identify soil types within the project area. Soil matrix colors were classified according to the Munsell Soil Color Charts (Munsell Color, 2009, Revised).

The wetlands and waters delineation work focused on identifying any existing wetland or water features that might be considered by the ACOE, CDFG, or the RWQCB to be jurisdictional wetlands within the project area. The ACOE San Francisco district office requires the use of the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (ACOE 2008a) for all delineations within its jurisdiction and the Mediterranean California Land Resource Region. "Waters of the U.S." are defined in 40 CFR Section 230.3:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

The ACOE and the U.S. Environmental Protection Agency (EPA) jointly define wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Environmental Laboratory 1987).

For purposes of classification, wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. The ACOE requires all three factors to be present to be considered a wetland. The USFWS and CDFG require just one of three. However, the USFWS and CDFG rarely play a role in the actual wetland delineation and assessment process, and principally serve to uphold the federal and state endangered species acts (Caltrans 2009). CDFG also may serve as a commenting agency to ACOE, under CEQA, and has jurisdiction over streams and lakes (California Fish and Game Code Section1600-1607). The ACOE is the sole agency charged with issuing a Section 404 permit, which allows regulated fill or other modification of wetlands or waters, and the legal requirements for those activities are enforced by the EPA.

The project also falls under the jurisdiction of the RWQCB. Section 401 of the Clean Water Act requires any applicant seeking a federal permit (such as Section 404) to conduct any activity that may result in a discharge of a pollutant into waters of the United States must also obtain certification from the state, issued locally by the RWQCB. The RWQCB also plays a role in review of water quality and wetland issues, including requiring specific impact avoidance and minimization measures. Section 401 certification is required prior to issuance of a Section 404 permit. The RWQCB regulates Solano County's National Pollutant Discharge Elimination System (NPDES) permit, which may necessitate a Stormwater Control Plan (USGPO 2009, Caltrans 2009, and Solano County Board of Supervisors 2007). The Porter-Cologne Water Quality Control Act is the primary state law concerning water quality, and it too, is enforced by the RWQCB. This Act authorizes the RWQCB to issue WDRs defining limitations on allowable discharge to waters of the state, and this WDR can be complementary to or independent from a Clean Water Act Section 401 certification (SWRCB 2009). "Waters of the State" are defined by the Porter-Cologne Act (Water Code Section 13050e) as "any surface water or groundwater, including saline waters, within the boundaries of the state."

4.2 Terminology

Language used in this report refers to specific terms and definitions from the ACOE Wetland Delineation Manual (Environmental Laboratory 1987). The following definitions are taken from the glossary of the 1987 ACOE Manual.

Dominance. A descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, areal cover, or basal area (for trees).

Dominant species. A plant species that exerts a controlling influence on or defines the character of a community.

Drift line. An accumulation of debris along a contour (parallel to the water flow) that represents the height of an inundation event.

Emergent plant. A rooted herbaceous plant species that has parts extending above a water surface.

Growing season. The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5 (C)) (U.S. Department of Agriculture & Soil Conservation Service 1985). For ease of determination this period can be approximated by the number of frost-free days (U.S Department of the Interior 1970).

Herb. A non-woody individual of a macrophytic species. In this manual, seedlings of woody plants (including vines) that are less than 3.2 feet in height are considered to be herbs.

Hydric soil. A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (U.S. Department of Agriculture & Soil Conservation Service 1985). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Hydrophyte. Any macrophyte that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats.

Indicator status. One of the categories (e.g., OBL) that describes the estimated probability of a plant species occurring in wetlands.

Inundation. A condition in which water from any source temporarily or permanently covers a land surface.

Saturated soil conditions. A condition in which all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

Upland. Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed non-wetlands.

Wetlands. Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

4.3 Field Survey

Prior to a site inspection for wetland and water features in the project area, CCCI reviewed existing information on the area, including local soil maps and surveys, United States Geological Survey (USGS) topographic maps, NWI maps, aerial photographs, and other environmental documentation for the project site.

Following standard methods described in the Arid West Manual (ACOE 2008a), CCCI's certified wetland delineators Rhiannon Klingonsmith, Mark Mendelsohn, Ted Robertson, and Felix Ratcliff surveyed for the presence of three classes of wetland indicators including vegetation, soils, and hydrology, at discrete sampling points and throughout the project area. Additionally, they surveyed for non-wetland, potentially jurisdictional "Other Waters" (e.g., streams, lakes, and channels), and riparian vegetation.

CCCI delineators visited the East Segment of the project area on April 27; May 5, 6, 9, 10, 11, 12, 13, 16, 17, 18, 19, 20, 24, 25, 26, 27 and 31; and June 3; and the West Segment on August 26, 30, 31, September 1, 2, 6, and 7 to conduct the delineation throughout the project area. They walked the entire 17 mile project length (performing multiple transects where the project area width necessitated more than one pass), identifying potential wetland indicators, estimating the number of formal sampling data points required, and mapping other hydrological features (i.e., streams, drainages, and culverts). The project area, including the road pavement, is approximately 817.74 acres. A total of 46.46 acres were delineated and verified under separate projects in 2008, and therefore those areas verified were not re-delineated for this report. Based on the project area size and the presence of different vegetation communities, the "routine large area" delineation method was required (Environmental Laboratory 1987).

Due to the large size of the project area and the limited amount of time allotted to perform field surveys, formal wetland delineation points (as specified in the 1987 ACOE Wetland Delineation Manual) were not sampled at every potential wetland encountered. Instead, a sampling point was taken for each hydrologically and topographically isolated feature. Results from that sampling point were extrapolated to include nearby features with similar soil and hydrology. In addition to the 15 formal data points, approximately 7 informal data points and numerous observations were made to delineate wetlands in the project area. Wetland boundaries were determined using vegetation, topography, and surface hydrology as primary indicators. Each topographically isolated wetland typically only had one wetland sampling point associated with it, but many informal observations.

The three classes of indicators were investigated at or immediately adjacent to each sampling point; the delineators completed the Wetland Determination Data Forms in the Arid West Manual. Global Positioning System (GPS) coordinates and photographs were taken at all sampling points, and wetland boundaries were recorded using GPS units with sub-meter accuracy, either a Magellan Professional or an Ashtech Mobile Mapper 100 (NAD 83 datum, State Plane coordinate system, California II FIPS 0402). Because most wetland features

encountered were narrow, linear, or channelized, only one 50-foot vegetation transect was conducted per sampling point. This transect was placed in line with the feature to maximize relevance to the vegetation characteristics of the feature. Plant identification aids employed during all vegetation sampling included Hickman (1993), Beidleman and Kozloff (2003), DiTomaso and Healy (2007), California Native Plant Society (2011), and CalPhotos (UC Berkeley 2011). Wetland indicator status for plant species followed Reed (1988) and USDA (2009). Plant scientific names in this report come from UCJEPS (2009) and USDA (2009). Soil and hydrology inspections followed ACOE (2008a). This report reflects the nomenclature used in the guides above; Appendix D includes both the old nomenclature and that used in the updated Jepson Manual (Baldwin et al. 2012).

Stream channels were delineated using two criteria to satisfy both ACOE and CDFG jurisdiction. The ACOE measures the lateral limits of non-wetland waters using the Ordinary High Water Mark (OHWM). Field indicators used to measure OHWM include vegetative as well as geomorphological characteristics. Vegetative indicators include herbs and pioneer tree saplings growing at the OHWM. Geomorphological indicators of the OHWM include stream benches, stains on rocks/concrete, silt deposits, and litter and drift deposits (ACOE 2008b). CDFG delineates lateral stream boundaries as equal to "Top of Bank" (TOB). TOB was measured as the larger of either the physical geomorphological top of bank of a stream, or the outside limit of riparian vegetation associated with the stream corridor. Because dense vegetation obscured satellite images of most of the streams, OHWM and TOB were delineated on foot, and were recorded using the same GPS units previously described (Appendix E).

4.4 Determination Form

Characteristics of the sampled areas and the climatic conditions in which they were surveyed were not disturbed or problematic during the field survey. Neither vegetation nor soils were significantly disturbed at the data point sites, with the exception of SW-1, which had been tilled in the year prior to delineation). Precipitation was above average at the time of the site visits. By April 27th, the beginning of the field surveys, 25.24 inches of precipitation had already fallen in Vacaville in the 2010-2011 wet season (Weather Underground 2011). This is above the annual average precipitation of 24.5 inches. By the end of the survey period (September 2011) 26.89 inches of precipitation had fallen in Vacaville.

Once data forms were completed for all sampling points, all potentially jurisdictional wetlands or waters were mapped in the field with a sub-meter accurate GPS receiver following standard protocols (Environmental Laboratory 1987). Topography and vegetation indicators (i.e., hydrophitic versus non-hydrophytic vegetation), were the primary indicators used to delineating wetland boundaries.

5.0 Results

Wetland determination data forms for the 22 sampling points are provided in Appendix F. The total delineated wetland and other waters acreage is 19.23 acres. This includes 6.08 acres of perennial wetland drainages, (creeks/perennial drainages (4.61 acres) are discussed in section 5.2), 0.72 acres of perennial marsh, 4.87 acres of riparian forest scrub, 1.76 acres of seasonal wetland, and 5.80 acres of seasonal drainage. Of the delineated features, a total of 13.18 acres of potentially jurisdictional wetlands and other waters are within the project area. This includes 0.72 acres of perennial marsh, 5.54 acres of perennial wetland drainage (including 4.61 acres of creeks), 1.70 acres of seasonal wetland and 5.22 acres of seasonal drainage. See Table 1 and 2 (Appendix E) for details describing each features size, type, location, and jurisdictional potential. In some locations, where project area boundaries were ambiguous, wetland features mapped extended outside of the project area limits.

5.1 Wetlands

Five types of wetlands and waters of the U.S. were identified in the project area during the CCCI site visits. Potential ACOE jurisdictional features include seasonal wetland, perennial wetland drainage, perennial marsh, and creeks/perennial drainages. Potential CDFG and RWQCB jurisdictional features also include seasonal drainages.

Perennial Wetland Drainage

Perennial wetland drainages (PWD) are perennially inundated/saturated drainage features which support perennial hydrophytic vegetation typical of marsh habitats. They function as both wetlands and drainages. Seven formal data points were taken for perennial wetland drainages in the project area.

Vegetation: Vegetation typical of this wetland type in the project area includes broad-leaf water plantain, narrowleaf cattail, broadleaf cattail, hardstem bulrush, giant horsetail, Iris-leaved rush, and hairy willow herb. Seven perennial wetland drainages were identified and delineated within the project area, for a total acreage of 1.47 acres (0.93 potentially jurisdictional acres). None of these occur in named drainages or creeks.

Soils: Soil textures in perennial wetland drainages typically had a clay component, with the exception of PWD-1, which was sandy loam (possibly road fill). Other soil textures in perennial wetland drainages were clay loam, clay, and silty clay. Soil matrix chroma was usually 1 (3 and 6 were the outliers). The most common soil indicators for wetland soils were a hydrogen sulfide odor, and a depleted matrix. One point, PWD-1, had histosol, also a wetland soil indicator.

Hydrology: Perennial wetland drainages in the project area were often situated in deeply concave features, with perennial water flow. Surface water was a common wetland indicator, with depths ranging from 0-9 inches. Soil saturation was also a commonly encountered wetland indicator, with saturated depths ranging from 0-12 inches. Other wetland hydrology indicators included hydrogen sulfide odor, surface soil cracks, water stained leaves, water marks, and in the case of PWD-1, aquatic vertebrates (frog tadpoles) were observed.

Perennial wetland drainages in the project area are labeled PWD 1-5, PWD-300, and PWD-305. Seven of these eight features are potentially jurisdictional wetlands, because these features may be hydrologically connected via culverts and drainage district systems into RPWs (creeks and

drainages) which eventually flow into Cache, Suisun, and Peytonia sloughs (TNWs). The exception is PWD-3, which is isolated, so is not a potentially jurisdictional wetland.

Perennial wetland drainages in the project area have the following biological, physical, and chemical wetland functions: they serve as seasonal and year-round habitat for a variety of fauna, and they provide year-round foraging, breeding, resting and hiding spaces for birds, aquatic invertebrates, and amphibians. These PWDs may provide habitat for several special-status plant species that potentially occur in the project area. Chemical and physical wetland functions include nutrient cycling, carbon source/sink, retention of water particulates, and removing pollutants from water (ACOE 2007b).

Perennial Marsh

Perennial Marsh (PM) wetlands are perennially inundated/saturated wetlands which support perennial hydrophytic vegetation typical of marsh habitats. One 0.72 acre perennial marsh, PM-1, was identified and delineated in the project area. Vegetation typical of this feature includes hardstem bulrush and iris-leaved rush. Soils in this feature had a silty clay texture and a depleted matrix. Hydrology indicators were surface water (1 inch deep or greater), high water table (from 0-12 inches below the soil surface), and soil saturation (from 0-20 inches below the soil surface). The USGS National Hydrography Dataset shows a drainage feature from this marsh almost connecting to Lagoon Valley Lake (USGS 2011). It is very likely that there is a hydrologic connection via over-ground sheet flow. If these features are connected, then PM-1 is hydrologically connected to Laguna Creek, a RPW. Laguna Creek flows into Alamo Creek which then flows 18 miles into Cache Slough, a TNW.

Wetland functions provided by PM-1 include serving as seasonal and year-round habitat for a variety of fauna, and providing year-round foraging, breeding, resting and hiding spaces for birds, aquatic invertebrates, and amphibians. This perennial marsh also may provide habitat for several special-status plant species that potentially occur in the project area. Chemical and physical wetland functions include nutrient cycling, carbon source/sink, retention of water particulates, and removing pollutants from water (ACOE 2007b).

Seasonal Wetland

Seasonal Wetlands (SW) are seasonally-inundated areas in ditches, swales, bases of hills, and meadows/fields that support a predominance of hydrophytic vegetation for all or part of the year. Nine data soil points were taken in seasonal wetlands in the project area. The remaining seven of the fourteen identified seasonal wetlands in the project area were delineated based on data from the nine formal points.

Vegetation: Vegetation in these wetlands is often dominated by annual hydrophytic grasses and forbs, often with a FAC indicator status, and usually includes other upland plant species. Plants typical of seasonal wetlands in the project area are broad-leaf water plantain, ripgut brome[*], soft brome[*], tall flatsedge, teasel[*], common spikerush, hairy willow herb, giant horsetail, wild geranium[*], Baltic rush, toad rush, brownhead rush, iris-leaved rush, broad-leaved peppergrass[*], creeping wildrye, Italian ryegrass[*], rabbitfoot grass[*], curly dock[*], hardstem bulrush, narrowleaf cattail, and broadleaf cattail.

[*] Non-native plant species

Soils: Soils in seasonal wetlands in the project area have a variety of textures, and almost always include a clay component. Soil textures detected in project area wetlands included silty clay, sandy clay loam, silt loam, and clay. Soil chroma was typically two or less, and the most common wetland soil indicator was a depleted matrix. Other soil indicators for seasonal wetlands were a hydrogen sulfide odor, depleted below dark surface, and redox dark surface.

Hydrology: Seasonal wetlands along I-80 in the project area often occurred in natural roadside ditches and other ephemeral drainage features. Sometimes wetlands occurred in low points in the ditches, or at culvert outfalls where water collected. Common wetland hydrology indicators were surface water (0-3 inches or greater), and high water table (from 0-16 inches below the soil surface), saturation (from 0-20 inches below the soil surface). Other observed indicators of seasonal wetlands were a hydrogen sulfide odor, water stained leaves, water marks, drift deposits, sediment deposits, aquatic invertebrates, and surface soil cracks.

Of the fourteen delineated seasonal wetlands in the project area, eleven are hydrologically connected, or have possible connections to RPWs, and are therefore potentially ACOE jurisdictional under the Rapanos Decision (Table 2). Six seasonal wetlands (SW-1, SW-5, SW-6, SW-7, SW-12 and SW-13) have over-ground hydrologic connectivity via non-RPW roadside ditches to RPWs. These features have varying proximities from 400 to 1,400 feet from RPWs. Five seasonal wetlands (SW-2, SW-8, SW-16, SW-300, and SW-301) have potential underground connectivity, via culverts, with unknown out-falls to RPWs. Three seasonal wetlands (SW-3, SW-4, and SW-302) are isolated and do not have a surface or sub-surface connection with RPWs. SW-12 has some inclusions of perennial wetland drainage along the northern edge of its perimeter. While we did not observe any hydrologic connectivity between SW-12 and a RPW or TNW, this wetland is included in the NWI dataset, and mostly occurs outside the project area where culverts and drainages were not mapped. Therefore, this feature is likely connected to other wetland features in its vicinity, possibly even Lagoon Valley Lake, 650 feet to the east, which is connected to TNW Cache Slough via RPW Laguna Creek. Appendix G shows seasonal wetlands and their proximities to RPWs/TNWs.

Wetland functions of seasonal wetlands in the project area include serving as seasonal habitat for a variety of fauna, and providing seasonal foraging, breeding, resting and hiding spaces for birds, aquatic invertebrates, and amphibians. Seasonal wetlands may provide habitat for several special-status plant species that potentially occur in the project area. Chemical and physical wetland functions include nutrient cycling, carbon source/sink, retaining water particulates, and removing pollutants from water (ACOE 2007b).

[*] Non-native plant species

Table 2 – Wetland Features Acreages and Status within the Project Area, Organized by Wetland Type

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
PM-1	Perennial Marsh	0.72	27	PM-1	Potentially Jurisdictional	Potentially Jurisdictional	Isolated wetland feature, no direct or indirect connection to a TNW	Drainage from this marsh almost connects to Lagoon Valley Lake, which is connected to Laguna Creek, a RPW. It flows 4000 ft NE and comes 950 ft from entering Lagoon Valley Lake.

Total Perennial Marsh: *0.72 acres*
Total Potentially Jurisdictional Perennial Marsh: *0.72 acres*

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
PWD-1	Perennial Wetland Drainage	0.16	34, 35	PWD-1	Potentially Jurisdictional	Potentially Jurisdictional	Connected to RPW (Ulatis Creek) that flows into a TNW (Suisun Slough).	Goes into culvert at N side of drainage, runs E along road. Unknown where it flows from there.
PWD-2	Perennial Wetland Drainage	0.19	22	PWD-2	Potentially Jurisdictional	Potentially Jurisdictional	Connected to Soda Springs Creek, a RPW, that connects to Laurel Creek, and Suisun Slough, a TNW.	Flows into culvert at E end of feature. Culvert appears to empty across I-80 (S side), flows toward Soda Springs Creek 2000 ft E of feature (drops 40 ft.).

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
PWD-3	Perennial Wetland Drainage	0.54	21, 22	PWD-3	Isolated	Potentially Jurisdictional	Connected to Soda Springs Creek, a RPW, that connects to Laurel Creek, and Suisun Slough, a TNW.	Appears isolated. Flow is potentially E under the highway through underground culverts for 3000 ft before entering Laurel Creek, an RPW.
PWD-4	Perennial Wetland Drainage	0.09	19	PWD-4	Potentially Jurisdictional	Potentially Jurisdictional	Connected to a RPW, that connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland. It flows into a culvert. 250 ft SE of this culvert, a large unnamed drainage flows into Suisun Slough. It is very likely that these drainages meet, in which case this wetland is connected to an RPW and a TNW.
PWD-5	Perennial Wetland Drainage	0.10	23	No Formal Data Point Taken	Potentially Jurisdictional	Potentially Jurisdictional	Potentially combines with PWD-3 and is potentially connected to Soda Springs Creek, a RPW, that connects to Laurel Creek, and Suisun Slough, a TNW.	Flows into culvert at E end of feature, traveling under the highway to a roadside drainage ditch and eventually into Soda Springs Creek.

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
PWD-300	Perennial Wetland Drainage	0.39	19	PWD-300	Potentially Jurisdictional	Potentially Jurisdictional	Connected to a RPW, that connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland into PWD-4. It flows into a culvert. 250 ft SE of this culvert, a large unnamed drainage flows to Suisun Slough.
PWD-305	Perennial Wetland Drainage	0.01	16	PWD-305	Potentially Jurisdictional	Potentially Jurisdictional	Potentially connected to a non-RPW, that then connects to Ledgewood Creek, a RPW, and into Peytonia Slough, a TWN.	Water in this feature flows to an unknown feature N of the project area which connects to a wetland.

Total Perennial Wetland Drainage: *1.47 acres*

(Not including 4.61 acres of delineated creek features = 6.08 acres total)

Total Potentially Jurisdictional Perennial Wetland Drainages: *0.93 acres (or 5.54 acres, including creeks)*

SW-1	Seasonal Wetland	0.38	25	SW-1	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW drainage to Soda Springs Creek, an RPW that flows into Suisun Slough, a TNW.	Water from this feature flows 840 ft south (west along I-80) to Soda Springs Creek, a RPW.
SW-2	Seasonal Wetland	0.07	24	SW-2	Potentially Jurisdictional	Potentially Jurisdictional	Connected to a non-RPW and then under I-80 in a culvert to a RPW (Soda Springs Creek into Laurel Creek) then into Suisun Creek, a TNW	Water from this feature flows under Lyon Road and then under I-80 through a culvert that flows E 1,500 ft into Laurel Creek.

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SW-3	Seasonal Wetland	0.02	23, 28	SW-3	Isolated	Potentially Jurisdictional	Isolated, occurs in a non-RPW roadside ditch, not connected to RPW/TNW.	Flows 450 ft east from roadside drainage potentially into golf course and into RPW, Laurel Creek.
SW-4	Seasonal Wetland	0.02	23	No Formal Data Point Taken--Represented by SW-3	Isolated	Potentially Jurisdictional	Isolated, occurs in a non- RPW roadside ditch, not connected to RPW/TNW.	Flows 450 ft east from roadside drainage potentially into golf course and into RPW, Laurel Creek.
SW-5	Seasonal Wetland	0.19	21	SW-5	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW into Soda Springs Creek, a RPW and into Laurel Creek, a RPW. This drainage flows into Suisun Slough, a TNW.	Flows 450 ft southwest through ditch along I-80 into unnamed perennial drainage 2, a RPW.
SW-6	Seasonal Wetland	<0.01	41, 42	SW-6	Potentially Jurisdictional	Potentially Jurisdictional	Connected to Pine Tree Creek, RPW, and Cache Slough, TNW.	Flows east 190 ft through a non-RPW roadside ditch into SW-7.
SW-7	Seasonal Wetland	0.01	42	SW-7	Potentially Jurisdictional	Potentially Jurisdictional	Connected to Pine Tree Creek, RPW, and Cache Slough, TNW.	Flows 1,400 ft through a drainage ditch into Pine Tree Creek as the creek turns southeast away from I-80. Thus it is connected to a RPW that eventually flows into a TNW (Cache Creek Slough).

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SW-8	Seasonal Wetland	0.05	40	SW-8	Potentially Jurisdictional	Potentially Jurisdictional	Non- RPW roadside ditch, may connect to RPW/TNW through culvert. Some water added to this wetland via landscaping sprinkler leak.	Flows into a culvert connecting to SW-10 and SW-11, then flows 200 ft under highway and roads into Pine Tree Creek.
SW-12	Seasonal Wetland	0.24	30	SW-12	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW roadside swale which connects to Unnamed Perennial Drainage 1, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Flows 400 ft into an unnamed drainage before entering Lagoon Valley Lake.
SW-13	Seasonal Wetland	0.02	28	SW-13	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW to drainage coming from PM-1. Then to Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Flows 400 ft to drainage coming from PM-1. Then it flows 1250 ft to 950 ft from Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.
SW-16	Seasonal Wetland	0.01	23	No Formal Data Point Taken.	Potentially Jurisdictional	Potentially Jurisdictional	Potentially connected to RPW/TNW via non-RPW culvert.	Connected to PWD-5.

Feature Number[a]	Feature Type	Acreage	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SW-300	Seasonal Wetland	0.04	19	No Formal Data Point Taken--Represented by SW-301	Potentially Jurisdictional	Potentially Jurisdictional	Connected to a RPW, that connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland into PWD-4. Then into a culvert, & 250 ft SE of this culvert, a large unnamed drainage passes by on its way to Suisun Slough.
SW-301	Seasonal Wetland	0.61	19	SW-301	Potentially Jurisdictional	Potentially Jurisdictional	Connected to a RPW, flows into Laurel Creek, then Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland into PWD-4, and into a culvert. Then 250 ft to the SE into a large unnamed drainage, and into Suisun Slough.
SW-302	Seasonal Wetland	0.01	29	No Formal Data Point Taken	Isolated	Potentially Jurisdictional	Isolated, occurs in a non-RPW roadside ditch, not connected to RPW/TNW.	Low point of roadside drainage ditch. Does not flow anywhere.

Total Seasonal Wetland: *1.76 acres*
Total Potentially Jurisdictional Seasonal Wetlands: *1.70 acre*

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-1	Seasonal Drainage	0.02	315.5	3.0	40,41	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows 350 ft before entering into Pine Tree Creek.
SD-2	Seasonal Drainage	0.03	584.3	2.0	40,41	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows 585 ft before entering into Pine Tree Creek.
SD-3	Seasonal Drainage	0.03	250.3	5.0	40,41	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows 250 ft before entering into Pine Tree Creek.
SD-4	Seasonal Drainage	<0.01	76.9	2.0	41	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-5	Seasonal Drainage	0.06	907.1	3.0	41	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Horse Creek, a RPW, then into Cache Slough, a TNW	Flows 907 ft directly into Horse Creek.
SD-6	Seasonal Drainage	0.01	138.0	4.0	40	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows 138 ft before entering into Pine Tree Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-9	Seasonal Drainage	0.04	587.0	3.0	39, 40	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows 587 ft into a series of culverts through seasonal wetland before entering into Pine Tree Creek.
SD-10	Seasonal Drainage	0.06	583.9	4.0	38	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible, but unknown.	Flows into culverts with an unknown out flow.
SD-11	Seasonal Drainage	0.02	207.9	4.0	38	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-12	Seasonal Drainage	0.01	77.0	5.0	38	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-13	Seasonal Drainage	0.01	135.7	3.0	38	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-14	Seasonal Drainage	0.01	113.4	4.0	37	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW	Flows 114 ft before flowing indirectly into Ulatis Creek.
SD-15	Seasonal Drainage	0.03	308.5	4.0	37	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW	Flows 308 ft through roadside drainage before flowing indirectly into Ulatis Creek.
SD-16	Seasonal Drainage	0.01	97.7	3.0	37	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW	Flows 98 ft through roadside drainage before flowing indirectly into Ulatis Creek.
SD-17	Seasonal Drainage	0.05	437.2	5.0	39, 40	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows into a culvert connecting to SW-8, SW-10 and SW-11, then flows 200 ft under highway and roads into Pine Tree Creek.
SD-18	Seasonal Drainage	0.03	128.0	10.0	40	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-20	Seasonal Drainage	0.01	161.1	4.0	40	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW	Flows 161ft into culverts directly into Pine Tree Creek
SD-21	Seasonal Drainage	0.08	1229.3	3.0	35, 36	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW	Flows above and below ground directly into Ulatis Creek
SD-22	Seasonal Drainage	0.01	146.6	2.0	36	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW	Flows above and below ground directly into Ulatis Creek
SD-23	Seasonal Drainage	0.01	221.1	2.5	35	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-24	Seasonal Drainage	0.03	916.0	1.5	34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-25	Seasonal Drainage	0.07	791.9	4.0	33, 34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-26	Seasonal Drainage	0.03	410.1	3.0	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-27	Seasonal Drainage	0.02	267.3	3.0	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-28	Seasonal Drainage	0.02	218.1	3.5	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-29	Seasonal Drainage	<0.01	91.4	2.0	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-30	Seasonal Drainage	0.01	108.3	4.0	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-31	Seasonal Drainage	<0.01	15.7	3.0	34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Connected to PWD-1, is indirectly connected to a RPW (Ulatis Creek) that flows into a TNW (Suisun Slough).	Flows 16 ft before entering into PWD-1.
SD-32	Seasonal Drainage	0.04	350.6	5.0	35	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW flows indirectly into Ulatis Creek, a RPW, then into Cache Slough, a TNW.	Flows above and below ground directly into Ulatis Creek
SD-33	Seasonal Drainage	0.04	409.6	4.0	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows east 410 ft directly into Laguna Creek.
SD-34	Seasonal Drainage	0.02	361.8	3.0	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows east 362 ft directly into Laguna Creek.
SD-35	Seasonal Drainage	0.02	218.0	3.0	31,32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows east 281 ft directly into Laguna Creek.
SD-38	Seasonal Drainage	0.01	246.8	2.0	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows through a series of drainages before entering directly into Laguna Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-39	Seasonal Drainage	<0.01	20.7	3.0	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that indirectly connects into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows indirectly into Laguna Creek, a RPW.
SD-40	Seasonal Drainage	0.02	245.7	3.0	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that indirectly connects into Laguna Creek, RPW, then into Cache Slough, a TNW.	Flows indirectly into Laguna Creek, a RPW.
SD-41	Seasonal Drainage	0.01	239.5	2.5	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that indirectly connects into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows indirectly into Laguna Creek, a RPW.
SD-42	Seasonal Drainage	0.02	292.6	2.5	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows through a series of drainages before entering directly into Laguna Creek.
SD-43	Seasonal Drainage	0.01	139.5	2.5	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows through a series of drainages before entering directly into Laguna Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-44	Seasonal Drainage	0.01	180.6	2.5	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows through a series of drainages before entering directly into Laguna Creek.
SD-45	Seasonal Drainage	0.03	382.4	3.0	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Alamo Creek, a RPW, then into Cache Slough, a TNW.	Flows 383 ft directly into Alamo Creek
SD-46	Seasonal Drainage	<0.01	42.5	2.5	32	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-47	Seasonal Drainage	<0.01	70.7	2.5	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows through a series of drainages before entering directly into Laguna Creek.
SD-48	Seasonal Drainage	0.01	71.8	4.0	31	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Unnamed Perennial Drainage 1, which flows into Laguna Creek, a RPW, then into Cache Slough, a TNW.	Flows directly into Unnamed Perennial Drainage 1.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-49	Seasonal Drainage	0.01	117.0	3.0	30	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake, then to Laguna Creek, an RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-50	Seasonal Drainage	0.13	1383.2	4.0	29, 30	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake, then to Laguna Creek, an RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-51	Seasonal Drainage	<0.01	50.9	2.0	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake, then to Laguna Creek, an RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-52	Seasonal Drainage	<0.01	59.5	2.0	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake then to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-53	Seasonal Drainage	0.09	1278.4	3.0	28, 29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake then to Laguna Creek, an RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-54	Seasonal Drainage	0.01	56.1	4.0	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake, then to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-55	Seasonal Drainage	0.01	50.7	6.0	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-56	Seasonal Drainage	<0.01	53.4	2.0	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, an RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-57	Seasonal Drainage	0.03	326.1	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-58	Seasonal Drainage	<0.01	97.3	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-59	Seasonal Drainage	0.02	285.1	3.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-60	Seasonal Drainage	0.01	208.4	3.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-61	Seasonal Drainage	0.01	118.7	5.0	27, 28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-62	Seasonal Drainage	<0.01	104.5	2.0	27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-63	Seasonal Drainage	0.02	345.7	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside the project area, which flows into Lagoon Valley Lake. The Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-64	Seasonal Drainage	0.01	147.3	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-65	Seasonal Drainage	<0.01	30.9	4.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects directly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-66	Seasonal Drainage	0.03	601.0	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside the project area, which flows into Lagoon Valley Lake. The Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-67	Seasonal Drainage	<0.01	153.8	1.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-68	Seasonal Drainage	<0.01	25.7	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-69	Seasonal Drainage	0.02	366.1	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-70	Seasonal Drainage	0.01	131.9	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-71	Seasonal Drainage	<0.01	108.7	2.0	28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-72	Seasonal Drainage	<0.01	70.6	1.0	27, 28	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-73	Seasonal Drainage	0.01	232.6	1.0	27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-74	Seasonal Drainage	0.01	299.5	2.0	27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-75	Seasonal Drainage	<0.01	67.1	2.0	27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-76	Seasonal Drainage	0.03	539.4	2.0	26, 27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows west through another drainage before directly entering Laurel Creek.
SD-79	Seasonal Drainage	0.03	469.0	2.5	26, 27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW	Flows indirectly into Laurel Creek, a RPW.
SD-80	Seasonal Drainage	0.02	403.4	2.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW	Flows indirectly into Laurel Creek, a RPW.
SD-81	Seasonal Drainage	0.01	106.8	3.5	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows indirectly into Laurel Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-82	Seasonal Drainage	0.01	167.9	3.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows indirectly into Laurel Creek, a RPW.
SD-83	Seasonal Drainage	0.01	175.1	3.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows indirectly into Laurel Creek, a RPW.
SD-84	Seasonal Drainage	0.01	99.1	3.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows indirectly into Laurel Creek, a RPW.
SD-85	Seasonal Drainage	0.02	337.4	2.0	25, 26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows directly into Laurel Creek.
SD-88	Seasonal Drainage	0.01	234.0	1.0	23	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to TNW.	No connectivity.
SD-89	Seasonal Drainage	<0.01	86.5	2.0	23	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-90	Seasonal Drainage	0.03	484.1	3.0	23, 24	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW	No connectivity.
SD-91	Seasonal Drainage	<0.01	46.7	1.5	24	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW	No connectivity.
SD-92	Seasonal Drainage	0.02	460.9	1.5	24	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert; potential indirect connection to a TNW is possible, but unknown.	Flows into culverts with an unknown out flow.
SD-93	Seasonal Drainage	<0.01	98.4	1.5	22	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW, then into Suisun Slough, a TNW.	Connects indirectly to an unnamed drainage outside the project area, which flows in to Soda Springs Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-94	Seasonal Drainage	<0.01	65.2	3.0	22	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW; then into Suisun Slough, a TNW.	Connects indirectly to an unnamed drainage outside of project area that flows into Soda Springs Creek.
SD-95	Seasonal Drainage	0.02	354.1	2.5	22, 23	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW; then into Suisun Slough, a TNW.	Connects indirectly to an unnamed drainage outside of project area that flows into Soda Springs Creek.
SD-96	Seasonal Drainage	0.01	138.4	2.0	22	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW directly connected to PWD-3; which is potentially linked to Soda Springs Creek, a RPW that connects to Laurel Creek, and Suisun Slough, a TNW.	Appears isolated. Flow is potentially east under the highway through underground culverts for 3000 ft before entering Laurel Creek, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-97	Seasonal Drainage	0.02	422.3	2.0	21	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW directly connected to PWD-3 that is potentially linked to Soda Springs Creek, a RPW; that connects to Laurel Creek, and Suisun Slough, a TNW.	Appears isolated. Flow is potentially east under the highway through underground culverts for 3000 ft before entering Laurel Creek, a RPW.
SD-98	Seasonal Drainage	0.01	451.0	1.0	21	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-99	Seasonal Drainage	0.02	404.1	2.0	21	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-100	Seasonal Drainage	<0.01	18.3	10.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-300 and PWD-4, which are indirectly connected to a RPW, which connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-102	Seasonal Drainage	0.01	50.0	12.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-300 and PWD-4, which are indirectly connected to a RPW, which connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-103	Seasonal Drainage	0.02	342.5	4.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW, then into Suisun Slough, a TNW	Connects indirectly to an unnamed drainage outside of project area that flows into Soda Springs Creek

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-104	Seasonal Drainage	0.01	126.6	2.0	22	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW, then into Suisun Slough, a TNW	Connects indirectly to an unnamed drainage outside of project area that flows into Soda Springs Creek
SD-105	Seasonal Drainage	<0.01	366.5	2.5	25	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-107	Seasonal Drainage	0.01	208.7	3.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laurel Creek, a RPW, then into Suisun, a TNW	Flows east 208 ft directly into Laurel Creek.
SD-108	Seasonal Drainage	<0.01	7.7	3.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laurel Creek, a RPW, then into Suisun, a TNW.	Flows into SD-107 which flows directly into Laurel Creek.
SD-109	Seasonal Drainage	0.08	879.7	4.0	26	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Laurel Creek, a RPW, then into Suisun, a TNW.	Flows west 880 ft directly into Laurel Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-111	Seasonal Drainage	0.01	155.7	2.5	25	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential direct or indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-113	Seasonal Drainage	0.02	378.9	2.0	25	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-114	Seasonal Drainage	0.01	219.6	1.5	25	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW, then into Suisun Slough, a TNW.	Potentially flows through SD-115 and SD-116 before entering directly into Soda Springs Creek.
SD-115	Seasonal Drainage	0.01	151.6	3.0	24, 25	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW, then into Suisun Slough, a TNW.	Potentially flows through SD-116 before entering directly into Soda Springs Creek.
SD-116	Seasonal Drainage	0.03	451.3	3.0	24, 25	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows indirectly into Soda Springs Creek, a RPW, then into Suisun Slough, a TNW.	Flows directly into Soda Springs Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-117	Seasonal Drainage	0.01	133.4	5.0	24	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-119	Seasonal Drainage	0.01	201.4	2.0	23	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-120	Seasonal Drainage	<0.01	111.8	1.0	22	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-121	Seasonal Drainage	0.02	526.9	2.0	22	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-122	Seasonal Drainage	<0.01	1.2	6.0	21	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-124	Seasonal Drainage	0.01	273.0	2.0	23, 24	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-125	Seasonal Drainage	<0.01	63.2	1.0	23	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-126	Seasonal Drainage	0.02	312.1	3.0	23	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-127	Seasonal Drainage	<0.01	28.7	4.0	23	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-129	Seasonal Drainage	0.11	2181.6	1.5	19, 20	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-300 which is potentially connected to a RPW, which connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch into PWD-4. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-130	Seasonal Drainage	<0.01	134.2	1.5	20	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-131	Seasonal Drainage	0.01	171.1	1.5	20	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-132	Seasonal Drainage	0.01	318.6	1.0	20, 21	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Unnamed Perennial Drainage 2, a RPW that potentially flows into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows directly into Unnamed Perennial Drainage 2, a RPW.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-133	Seasonal Drainage	0.02	517.1	2.0	21	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Unnamed Perennial Drainage 2, a RPW that potentially flows into Laurel Creek, a RPW, then into Suisun Slough, a TNW.	Flows directly into Unnamed Perennial Drainage 2, a RPW.
SD-135	Seasonal Drainage	0.01	77.5	4.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4 that is potentially connected to Laurel Creek, a RPW, and then Suisun Slough, a TNW.	Water follows the drainage ditch out of the wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-136	Seasonal Drainage	0.01	52.5	9.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4 that is potentially connected to Laurel Creek, a RPW, and then Suisun Slough, a TNW.	Water follows the drainage ditch out of the wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-137	Seasonal Drainage	0.01	63.6	8.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4 that is potentially connected to Laurel Creek, a RPW, and then Suisun Slough, a TNW.	Water follows the drainage ditch out of the wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-139	Seasonal Drainage	0.12	2634.8	2.0	18, 19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4 that is potentially connected to Laurel Creek, a RPW, and then Suisun Slough, a TNW.	Water follows the drainage ditch out of the wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-140	Seasonal Drainage	0.03	1518.2	1.0	19, 20	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4 that is potentially connected to Laurel Creek, a RPW, and then Suisun Slough, a TNW.	Water follows the drainage ditch out of the wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-141	Seasonal Drainage	<0.01	75.2	2.0	20	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW indirectly connected to a seasonal wetland outside of project area, which is connected to an unnamed channel that flows into Laurel Creek, a RPW, and then into Suisun Slough, a TNW.	Flows into a wetland that is potentially indirectly connected to a RPW, Laurel Creek.
SD-142	Seasonal Drainage	0.12	2538.8	2.0	23, 24, 25	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-143	Seasonal Drainage	<0.01	75.4	2.0	25	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW	No connectivity.
SD-144	Seasonal Drainage	0.04	1231.9	1.5	25, 26	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW	No connectivity.
SD-145	Seasonal Drainage	<0.01	16.2	5.0	27	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects to Unnamed Perennial Drainage outside of the project area, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Directly connected to an unnamed RPW that flows directly onto Laguna Creek, a RPW.
SD-146	Seasonal Drainage	0.04	1140.9	1.5	28, 29,30	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-147	Seasonal Drainage	0.04	1075.2	1.5	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows into SW-12, a non-RPW roadside swale, connects to Unnamed Perennial Drainage 1, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Flows directly into SW-12 which is potentially connected to a RPW (Laguna Creek).
SD-148	Seasonal Drainage	0.07	1171.4	2.5	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows into SW-12, a non-RPW roadside swale, connects to Unnamed Perennial Drainage 1, which flows into Lagoon Valley Lake. Lagoon Valley Lake is connected to Laguna Creek, a RPW, and Cache Slough, a TNW.	Flows directly into SW-12 which is potentially connected to a RPW (Laguna Creek).
SD-149	Seasonal Drainage	0.07	1069.1	3.0	34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-150	Seasonal Drainage	0.04	568.8	3.0	34	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-151	Seasonal Drainage	0.02	404.1	2.0	35	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-152	Seasonal Drainage	0.01	514.0	1.0	35	SD-152	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-153	Seasonal Drainage	<0.01	81.6	1.5	36	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW.	Flows above ground directly into Ulatis Creek
SD-154	Seasonal Drainage	0.01	143.0	2.0	36	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Ulatis Creek, a RPW, then into Cache Slough, a TNW.	Flows above ground directly into Ulatis Creek
SD-156	Seasonal Drainage	<0.01	3.7	3.0	38	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-157	Seasonal Drainage	0.01	613.3	1.0	41, 42	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-158	Seasonal Drainage	0.02	699.5	1.5	41, 42	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected directly to Horse Creek, a RPW, which flows into Cache Slough, a TNW.	Flows directly into Horse Creek, a RPW.
SD-159	Seasonal Drainage	0.04	697.0	2.5	41, 42	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected directly to Horse Creek, a RPW, which flows into Cache Slough, a TNW.	Flows directly into Horse Creek, a RPW.
SD-160	Seasonal Drainage	0.03	932.8	1.5	41,42	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW.	Flows 933 ft before entering into Pine Tree Creek.
SD-161	Seasonal Drainage	<0.01	77.1	1.0	39	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-162	Seasonal Drainage	0.04	787.2	2.0	33, 34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-163	Seasonal Drainage	0.02	417.8	2.0	33, 34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-164	Seasonal Drainage	0.01	301.0	1.5	33	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-165	Seasonal Drainage	0.03	506.1	2.5	31, 32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects directly to Laguna Creek, a RPW, that flows into Cache Slough, a TNW.	Flows directly into a RPW (Laguna Creek)
SD-166	Seasonal Drainage	0.07	1635.4	1.5	27	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-168	Seasonal Drainage	0.01	249.6	1.0	26, 27	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-169	Seasonal Drainage	0.01	282.6	1.0	26	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-170	Seasonal Drainage	0.01	132.1	2.0	26	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-171	Seasonal Drainage	0.01	192.6	2.0	24	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-172	Seasonal Drainage	<0.01	83.9	2.0	19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected PWD-300 and PWD-4, which are indirectly connected to a RPW, which connects to Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-173	Seasonal Drainage	0.05	1033.1	2.0	19	SD-173	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4, which is indirectly connected to a RPW, Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-174	Seasonal Drainage	0.01	575.5	1.0	18, 19	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected to PWD-4, which is indirectly connected to a RPW, Laurel Creek, and Suisun Slough, a TNW.	Water follows the drainage ditch out of this wetland. It flows into a culvert. 250 ft southeast of this culvert a large unnamed drainage passes by on its way to Suisun Slough.
SD-175	Seasonal Drainage	0.40	1170.6	15.0	34	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-176	Seasonal Drainage	<0.01	83.4	2.0	21	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-177	Seasonal Drainage	0.02	195.6	5.0	40,177	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW that flows directly into Pine Tree Creek, a RPW, then into Cache Slough, a TNW.	Flows directly into Pine Tree Creek, a RPW.
SD-178	Seasonal Drainage	0.02	433.2	2.0	32	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects indirectly to Laguna Creek, a RPW, that flows into Cache Slough, a TNW.	Flows through SW-47 and SW-65 before directly entering into a RPW (Laguna Creek).
SD-179	Seasonal Drainage	0.03	461.4	3.0	30	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-180	Seasonal Drainage	<0.01	40.7	2.0	29	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-181	Seasonal Drainage	<0.01	206.3	1.0	21	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW	No connectivity.
SD-182	Seasonal Drainage	0.04	485.0	4.0	37	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-183	Seasonal Drainage	<0.01	26.9	5.0	38	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-186	Seasonal Drainage	0.01	130.3	3.0	37	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-300	Seasonal Drainage	0.02	134.1	6.0	17, 18	SD-300	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-301	Seasonal Drainage	0.06	635.7	4.0	17	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-302	Seasonal Drainage	0.10	1077.6	4.0	16, 17	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-303	Seasonal Drainage	0.01	37.7	6.0	16	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-304	Seasonal Drainage	0.01	267.9	2.0	16	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-306	Seasonal Drainage	0.02	192.8	4.5	16	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-307	Seasonal Drainage	<0.01	76.3	2.0	15	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-308	Seasonal Drainage	0.02	466.9	2.0	15	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-309	Seasonal Drainage	<0.01	59.3	1.0	15	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-310	Seasonal Drainage	0.02	110.7	7.0	15	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-311	Seasonal Drainage	0.01	157.1	2.0	15	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-312	Seasonal Drainage	0.01	110.2	4.0	15	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-313	Seasonal Drainage	0.09	1140.3	3.3	14	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-314	Seasonal Drainage	0.01	257.4	2.0	14	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-315	Seasonal Drainage	0.01	108.4	3.0	14	SD-315	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-316	Seasonal Drainage	<0.01	6.8	5.0	13, 14	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-318	Seasonal Drainage	<0.01	67.5	3.0	13	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-319	Seasonal Drainage	0.03	549.5	2.0	12	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-320	Seasonal Drainage	0.02	372.9	2.0	12	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-321	Seasonal Drainage	0.10	1434.7	3.0	11	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-322	Seasonal Drainage	0.04	866.2	2.0	10, 11	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-323	Seasonal Drainage	0.10	1485.8	3.0	10, 11	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-324	Seasonal Drainage	0.02	190.7	4.0	10	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-325	Seasonal Drainage	0.18	2674.2	3.0	8, 9	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected directly to Suisun Creek, a RPW, that flows into Peytonia Slough, a TNW.	Flows directly into SD-326 which flows directly into Suisun Creek, a RPW.
SD-326	Seasonal Drainage	0.13	1855.2	3.0	7, 8	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connected directly to Suisun Creek, a RPW, that flows into Peytonia Slough, a TNW.	Flows directly into Suisun Creek, a RPW.
SD-327	Seasonal Drainage	0.04	611.8	3.0	7	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-328	Seasonal Drainage	0.02	354.1	2.0	6	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW potentially connected by underground culvert to SD-428 connects directly to Dan Wilson Creek, a RPW, then to Peytonia Slough, a TNW.	Flows into a culvert that may be connected to SD-428 which is connected to a RPW, Dan Wilson Creek.
SD-329	Seasonal Drainage	0.02	491.0	2.0	5,6	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-330	Seasonal Drainage	<0.01	18.7	2.0	5	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-331	Seasonal Drainage	<0.01	49.4	1.0	5	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-332	Seasonal Drainage	0.03	645.3	2.0	1, 2	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-333	Seasonal Drainage	0.02	258.9	3.0	1	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-403	Seasonal Drainage	0.03	588.5	2.0	2	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-404	Seasonal Drainage	0.07	1485.5	2.0	2, 3	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-405	Seasonal Drainage	<0.01	179.7	1.0	3, 4	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-420	Seasonal Drainage	0.03	241.0	6.0	4	SD-420	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects directly to Green Valley Creek, a RPW that is connected to Peytonia Slough, a TNW.	Flows directly into a RPW, Green Valley Creek.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-422	Seasonal Drainage	0.03	461.1	3.0	4	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects directly to Green Valley Creek, a RPW that is connected to Peytonia Slough, a TNW.	Flows directly into a RPW, Green Valley Creek.
SD-424	Seasonal Drainage	0.03	792.4	1.5	4	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW connects directly to Unnamed Perennial Drainage 3, which flows into to Green Valley Creek, a RPW that is connected to Peytonia Slough, a TNW.	Flows directly Unnamed Perennial Drainage 3, a RPW.
SD-425	Seasonal Drainage	0.01	91.0	3.0	5	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-426	Seasonal Drainage	0.02	388.5	2.0	5	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-427	Seasonal Drainage	0.02	499.5	1.5	5	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-428	Seasonal Drainage	0.02	242.4	3.0	6	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Non-RPW directly connected to Dan Wilson Creek, a RPW, then to Peytonia Slough, a TNW.	Flows into a RPW, Dan Wilson Creek.
SD-430	Seasonal Drainage	0.02	512.1	2.0	9, 10	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-431	Seasonal Drainage	0.01	69.7	8.0	10	SD-431	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-432	Seasonal Drainage	0.06	1231.4	2.0	11	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-433	Seasonal Drainage	0.02	354.0	2.0	12	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-434	Seasonal Drainage	0.03	661.3	2.0	12	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-435	Seasonal Drainage	0.08	1221.1	3.0	13, 14	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-436	Seasonal Drainage	0.07	1453.0	2.0	14	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-437	Seasonal Drainage	<0.01	135.6	1.0	15	n/a	Non-jurisdictional	Non-jurisdictional	Roadside drainage ditch, non-jurisdictional, no potential direct or indirect connection to a TNW.	No connectivity.
SD-438	Seasonal Drainage	0.15	2107.1	3.0	15, 16	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-439	Seasonal Drainage	0.09	1115.3	3.5	16	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-440	Seasonal Drainage	0.03	351.4	4.0	16, 17	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-441	Seasonal Drainage	0.09	1376.6	3.0	17, 18	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-445	Seasonal Drainage	0.01	110.2	2.0	18	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-446	Seasonal Drainage	0.01	107.8	6.0	17, 18	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Feature Number[a]	Feature Type	Acreage	Drainage Length (feet)	Drainage Average Width (feet)	Appendix E Sheet Number	Data Form	ACOE Jurisdiction	State Jurisdiction	Clean Water Act Jurisdiction Description	Connectivity to RPW
SD-447	Seasonal Drainage	<0.01	76.8	2.0	2	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-448	Seasonal Drainage	<0.01	4.7	1.5	5	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-449	Seasonal Drainage	<0.01	83.9	2.0	12	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.
SD-450	Seasonal Drainage	0.02	358.6	3.0	16	n/a	Potentially Jurisdictional	Potentially Jurisdictional	Roadside drainage ditch with flow into culvert, potential indirect connection to a TNW is possible but unknown.	Flows into culverts with an unknown out flow.

Total Seasonal Drainages: *5.80 acres*
Total Potentially Jurisdictional Seasonal Drainages: *5.22 acres*

[a] = Wetland features mapped within the project area Limits. Features mapped outside of the project area are not included in this table and are located in Appendix E attribute table at end of the Potentially Jurisdictional Wetland and Project Feature Maps.

5.2 Other Waters

Creeks/Perennial Drainages
Twelve creeks and three unnamed perennial drainages pass through the project area. These RPWs convey water from the hills northeast of the project area to TNWs Cache, Suisun, and Peytonia Sloughs. The perennial drainages in the project area are: Jameson Canyon Creek, Green Valley Creek, Dan Wilson Creek, Suisun Creek, Unnamed Perennial Drainage 3, Ledgewood Creek, Putah Canal, Unnamed Perennial Drainage 2, Soda Springs Creek, Laurel Creek, Laguna Creek, Unnamed Perennial Drainage 1, Alamo Creek, Ulatis Creek, Pine Tree Creek, and Horse Creek.

Wetland functions of creeks and perennial drainages in the project area include serving as year-round habitat for a variety of fauna, providing movement corridors, seasonal foraging, breeding, resting, and hiding spaces for birds, mammals, herpetofauna, and aquatic invertebrates. Creeks, perennial drainages, and their associated riparian corridors may also provide habitat for several special-status plant species potentially occurring in the project area. Chemical and physical wetland functions of creeks and perennial drainages include nutrient cycling, organic carbon source/sink, retaining water particulates, removing pollutants from water, flood de-synchronization, organic debris trapping and storage, sediment debris trapping and storage, organic material decomposition, and nitrogen and phosphorus transformation (ACOE 2007b).

Seasonal/Ephemeral Drainages
In total, 225 seasonal drainages were mapped in the project area. Of these, 192 drainages are hydrologically connected (or potentially hydrologically connected) to RPWs/TNWs, and are therefore potentially ACOE jurisdictional (See Table 2 and Appendix E). These drainages carry water intermittently, usually draining surface run-off after rain events from paved areas, hillsides, meadows, and farm fields, they therefore do not qualify as RPWs. Drainage centerlines were recorded in the project area on foot via a sub-meter accurate GPS unit. Direction of flow and the average width of each drainage feature were also recorded. OHWM indicators used to determine width were vegetation characteristics, water marks, sediment deposits, and scouring. Drainage widths varied from one to twelve feet, with an average of three feet. There are 5.80 acres of seasonal drainages in the project area, 5.22 acres of which are potentially jurisdictional.

Hydrologic connections and assumed hydrologic connections to RPWs take four forms. The first is above-ground direct connections. Sixty-nine features connect to RPWs via direct surface connections (through ditches, swales, and above-ground sheet flow). The second method of connection is through culverts. These connections are assumed when a drainage feature flows into a culvert with an unknown outfall. Forty seasonal drainages have this type of hydrologic connection in the project area. The third type of assumed connection is when a drainage flows out of the project area and hydrologic connectivity could not be ruled out. Eighty-two drainages are considered potentially jurisdictional under this criterion. The final type of hydrologic connection is when a drainage feature flowed into a NWI-mapped wetland with unknown hydrologic connections (See Appendix B). This only applies to SD-148 which flows into the NWI wetland mapped near Pena Adobe Road. It is presumed this wetland is hydrologically connected to an RPW/TNW since it is mapped in the NWI database. The remaining features are not considered ACOE jurisdictional. The ACOE does not typically assert jurisdiction over seasonal drainages and roadside ditches that drain only upland areas and are not hydrologically

connected to RPWs/TNWs, but CDFG and RWQCB may consider some of these features jurisdictional (Appendix H).

Wetland functions of seasonal drainages in the project area include serving as seasonal habitat for a variety of fauna, and providing seasonal foraging, breeding, resting and hiding spaces for birds and aquatic invertebrates. Seasonal drainages may also provide habitat for several special-status plant species potentially occurring in the project area. Chemical and physical wetland functions of creeks and perennial drainages include nutrient cycling, organic carbon source/sink, retaining water particulates, removing pollutants from water, storing sediment, organic material decomposition, and nitrogen and phosphorus transformation (ACOE 2007b).

Culverts
356 culvert openings were identified in the project area (See Appendix E). When encountered, culvert openings were marked with a GPS, and direction of flow and diameter were recorded. Photographs were also taken of each culvert opening. Culvert sizes varied from one-foot diameter corrugated steel culverts, to six by ten foot concrete box culverts. Culvert openings were recorded to gauge hydrologic flow within the project area and to show whether delineated wetlands were hydrologically connected to RPWs. It was not usually possible to map the course of the culverts themselves, and it should be noted that the total number of culvert openings is greater than the total number of culverts as every culvert has at least two openings.

6.0 Discussion

6.1 Permitting

Seventeen seasonal wetlands, seven perennial wetland drainages, and one perennial marsh appear to be hydrologically connected to RPWs in the project area. The ACOE will determine whether the delineated wetlands form a significant nexus with Cache Slough, Suisun Slough, and Peytonia Slough. If the delineated wetlands are determined to be ACOE-jurisdictional, impacts to these wetlands due to project-related activities are likely to require a Section 404 permit issued by the ACOE (a Regional or Nationwide General Permit if possible; an Individual Permit only if a General is not possible). However, wetlands determined to be isolated wetlands, and not ACOE-jurisdictional, remain potentially State jurisdictional since isolated waters are considered waters of the State. WDRs, under the Porter-Cologne Act, would then likely be required from the RWQCB. It is recommended that this permitting process and any others be initiated as soon as possible since permits often take several months or longer to obtain.

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APPENDIX M

SHPO Concurrence Letter

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

July 2, 2015 Reply To: FHWA_2015_0512_001

Anmarie Medin, Chief
Cultural Studies Office
Caltrans Division of Environmental Analysis
PO Box 942874
Sacramento, CA 94274-0001

Re: Determinations of Eligibility and Finding of Effect for the Proposed I-80 Express Lanes Project, Solano County, CA

Dear Ms. Medin:

You are consulting with me about the subject undertaking in accordance with the January 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

In your letter of May 12, 2015, Caltrans determined pursuant to Stipulation VII.C.6 of the PA, that the following properties are not eligible for the National Register of Historic Places (NRHP):

- 4004-4018 Russell Road, Fairfield, CA
- 290, 300, 316 Butcher Road, Vacaville, CA
- 280, 310, 312 Butcher Road, Vacaville, CA
- 270 and 272 Butcher Road, Vacaville, CA
- Cherry Glen Road Overcrossing
- Rivera Road Overcrossing

In addition, in accordance with Attachment 5 of the PA, CA-SOL-30/H, SOL-270/H, and P-48-00897 will be assumed eligible for the NRHP in accordance with Stipulation VII.C.4 of the PA for the purposes of this undertaking and Environmentally Sensitive Areas (ESA) will be designated according to the sites' previously known boundaries to protect them from inadvertent construction impacts. The ESA for CA-SOL-30/H will also include the above ground Peňa Adobe properties that are located outside of the area of potential effect.

The project will require trenching in the highway median for an electrical conduit near CA-SOL-30/H, SOL-270/H, and P-48-00897. Additional presence/absence testing is needed to confirm that sites do not extend into the median in locations of proposed trenching. Per Stipulation XII.B or the PA, District 4 sought and was granted approval by CSO to continue with the phased identification effort on October 30, 2014.

Far Western Anthropological Research Group, Inc. developed a Phased Cultural Identification Plan detailing the identification effort and plan for data recovery should archeological resources, and potential to adversely affect the resources, be identified. A backhoe or truck-mounted coring device will be used at the three site locations within the footprint of the conduit trench. Testing of any identified cultural deposits will be achieved through hand excavation units. This work will take place in lane closures during construction to minimize impact to traffic operations and ensure that work is completed safely.

Per Stipulation X.B.2 of the PA, Caltrans found that the proposed project will have no adverse effect on historic properties.

Based on my review of the submitted documentation, I concur with the foregoing determinations and findings.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 or email at natalie.lindquist@parks.ca.gov.

Sincerely,

Jenan Saunders
Deputy State Historic Preservation Officer

APPENDIX N

FHWA Project-Level Air Quality Conformity Letter

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U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
California Division

650 Capitol Mall, Suite 4-100
Sacramento, CA 95814
(916) 498-5001
(916) 498-5008 (fax)

Sept 22, 2015

In Reply Refer To:
HDA-CA

Mr. Bijan Sartipi
District Director
California Department of Transportation,
District 4
P.O. Box 23660, Oakland, CA 94623-0660

Attention: Shiang Yang

SUBJECT: Project Level Conformity Determination for the I-80 Express Lanes Project (4G080)

Dear Mr. Sartipi:

On August 26, 2015, the California Department of Transportation (Caltrans) submitted to the Federal Highway Administration (FHWA) a complete request for a project level conformity determination for the I-80 Express Lanes Project. The project is in an area that is designated Non-Attainment or Maintenance for Carbon Monoxide (CO), Ozone and Particulate Matter (PM 2.5).

The project level conformity analysis submitted by Caltrans indicates that the project-level transportation conformity requirements of 40 CFR Part 93 have been met. The project is included in the Metropolitan Transportation Commission's (MTC) current Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP), as amended. The design concept and scope of the preferred alternative have not changed significantly from those assumed in the regional emissions analysis.

As required by 40 CFR 93.116 and 93.123, the localized PM analyses are included in the documentation. The analyses demonstrate that the project will not create any new violations of the standards or increase the severity or number of existing violations.

Based on the information provided, FHWA finds that the I-80 Express Lanes Project conforms with the State Implementation Plan (SIP) in accordance with 40 CFR Part 93.

If you have any questions pertaining to this conformity finding, please contact Joseph Vaughn at (916) 498-5346 or by email at Joseph.Vaughn@dot.gov.

Sincerely,

For:Vincent P. Mammano
Division Administrator

APPENDIX O

USFWS Biological Opinion and NMFS Programmitc Biological Opinion

United States Department of the Interior

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

In Reply Refer to:
08ESMF00-
2012-F-0198-1

AUG 17 2015

Ms. JoAnn Cullom
California Department of Transportation
Environmental Division, MS-8E
111 Grand Avenue
Oakland, California 94612

Subject: Formal Consultation on the Interstate 80 Express Lanes Project, Solano County, California (Caltrans EA 2A332)

Dear Ms. Cullom:

This Biological Opinion (BO) is in response to the California Department of Transportation's (Caltrans) March 30, 2015 request for consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Interstate 80 (I-80) Express Lanes Project in Solano County, California. At issue are the proposed project's effects on the Federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) the threatened California red-legged frog (*Rana draytonii*), and critical habitat for the California red-legged frog. Critical habitat has been designated for the valley elderberry longhorn beetle but does not occur within the action area. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.)(Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law on July 6, 2012. Effective, October 1, 2012, MAP-21 includes provisions to promote streamlined and accelerated project delivery. Caltrans was approved to participate in the MAP-21 Surface Transportation Project Delivery Program through the National Environmental Policy Act (NEPA) Assignment Memorandum of Understanding (MOU). The MOU allows Caltrans to assume the Federal Highway Administration's (FHWA) responsibilities under NEPA as well as FHWA's consultation and coordination responsibilities under Federal environmental laws for most highway projects in California. Caltrans is exercising this authority as the Federal nexus for section 7 consultation on this project.

The Federal action we are consulting on includes establishment of a shared high-occupancy-vehicle (HOV) and single occupancy express lane along the I-80 corridor between the Cities of Vacaville and Fairfield. Pursuant to 50 CFR 402.12(j), you submitted a Biological Assessment (BA) for our review and requested concurrence with the findings presented therein. Caltrans determined that the proposed project may affect, and is not likely to adversely affect the valley elderberry longhorn

beetle but is likely to adversely affect the California red-legged frog. and it's critical habitat for the California red-legged frog.

In considering your request, we based our evaluation on the following: (1) Caltrans' March 30, 2015 request for consultation and accompanying March 2015, BA; (2) the Service's experience on other recent consultations concerning the I-80, State Route (SR) 12, and I-680; (3) Caltrans' July 20, 2015, response to the Service's June 4, 2015, electronic mail (e-mail) message; (4) additional information provided by Caltrans on July 21, 22, and 23, 2015; and (5) other information available to the Service.

As a result of their surveys, Caltrans identified two elderberry shrubs within the action area. According to Caltrans, the plants are 75 and 97 feet from the edge of the project footprint and will not be removed or harmed as a result of the project. The Service concurs with Caltrans determination that the proposed project may affect, but is not likely to adversely affect the valley elderberry longhorn beetle, which may inhabit these shrubs, because the shrubs will not be removed or trimmed as a result of the project and Caltrans will implement the following measures:

1. The Worker Environmental Awareness Training (WEAT) program will include discussion of the valley elderberry longhorn beetle and the importance of complete avoidance of its elderberry host plant.

2. Under the Service-approved biologist's direction, orange construction barrier fencing will be installed to establish a minimum of a 20 foot buffer from the drip line of the two elderberry shrubs prior to ground disturbing activities in their vicinity.

3. Ground disturbance for access and work space throughout the project area will be subject to stabilization, erosion control, and restoration with native plants species following construction.

4. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used in association with the project.

5. A spill prevention and response plan will be prepared prior to construction and will be implemented immediately for cleanup of fluid or hazardous materials spills.

6. Caltrans will include provisions in the construction bid documents that the contractor will implement a dust control program to limit fugitive dust emissions.

7. Signs will be erected every 50 feet along the edge of the elderberry shrub avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be clearly readable from a distance of 20 feet, and will be maintained for the duration of construction.

Caltrans has a standard practice of using locally sourced native plant seed in their erosion control applications and restoration efforts. Some of the plant species included in the mix are food plants for the adult monarch butterflies. Inclusion of locally native milkweed seed would have conservation value for the monarch and be in line with Caltrans' environmental stewardship goals. It is likely that Caltrans will discover that milkweed seed is readily available and its inclusion would not result in additional project costs relative to the cost of other seed used in the existing mix.

The White House released a presidential memorandum in June 2014 calling for a Federal strategy to promote the health of honey bees and other pollinators. The monarch and the Department of Transportation are specifically mentioned in the memo. (Available at: https://www.whitehouse.gov/the-press-office/2014/06/20/presidential-memorandum-creating-federal-strategy-promote-health-honey-b.)

As stated in the memo: "The Department of Transportation shall evaluate its current guidance for grantees and informational resources to identify opportunities to increase pollinator habitat along roadways and implement improvements, as appropriate. The Department of Transportation shall work with State Departments of Transportation and transportation associations to promote pollinator-friendly practices and corridors. The Department of Transportation shall evaluate opportunities to make railways, pipelines, and transportation facilities that are privately owned and operated aware of the need to increase pollinator habitat." Encouraging milkweed establishment and improving pollinator habitat within the Caltrans right of way (ROW) could result in beneficial effects for the monarch.

The remainder of this document provides our biological opinion on the effects of the proposed project on the California red-legged frog and its critical habitat.

Consultation History

January 27, 2012	The Service provided authorization for wet season branchiopod surveys via an e-mail message.
October 9, 2012	The Service provided authorization for dry season branchiopod surveys.
January 8, 2013	The Service received the results of Caltrans' 2012 dry season branchiopod surveys. According to the report, no listed branchiopod species eggs were detected.
April 1, 2015	The Service received Caltrans' March 30, 2015 request for consultation along with a March 2015 BA.
June 4, 2015	The Service sent Caltrans an e-mail message regarding our review of the consultation request and March 2015 BA. The e-mail message provided the functional equivalent of a 30-day letter.
July 20, 2015	The Service received Caltrans' response to our June 4, 2015 correspondence. Caltrans response provided information needed to complete the consultation.
July 21-23, 2015	Caltrans provided additional information regarding the project acreage via e-mail messages and telephone conversations.

BIOLOGICAL OPINION

Description of the Action

According to Caltrans, the purpose of the project is to establish shared high occupancy vehicle HOV lanes/express lanes within an approximately 18 mile length of I-80 from west of Red Top

Road to east of I-505 (Post Miles 10.4 to 30.2). The shared lanes would be established in both direction of travel.

The project is divided into two road segments that will be built in two construction phases. The first phase, or West Segment, extends approximately 8.1 miles from the Red Top Road interchange to the Air Base Parkway interchange, including the area around the I-80/I-680 interchange. The West Segment includes existing HOV lanes that will be modified to accommodate shared express lane features. West Segment construction will also include the extension of the existing auxiliary lane along eastbound I-80 between the Beck Avenue on-ramp and Travis Boulevard off-ramp, modification of the existing eastbound Travis Boulevard off-ramp into two separate off-ramps, and installation of highway lighting at mainline decision points.

The second phase, or East Segment, is approximately 9.4 miles long from the Air Base Parkway interchange through the I-80/I-505 interchange. The East Segment has no existing HOV lane and therefore new shared lanes will be constructed as a result of the project. The majority of the roadway widening to accommodate the new lanes will be constructed in the inside median. The lane additions will involve the placement of pavement, concrete barriers, 38 retaining walls, two sound walls, widening of the two bridges over Ulatis and Horse Creeks, widening the Davis Street and Mason Street undercrossings, the addition of new tie back walls at the eastbound I-80 to northbound I-505 Connector Separation structure and the Cherry Glen and Rivera Road overcrossings, drainage culvert extensions, and right-of-way (ROW) acquisition. Modifications to drainage systems will include replacement of existing infrastructure and enclosing sections of existing open drainage that will be located under new structures. Bio/hydromodification swales will also be installed.

Numerous utility facilities exist in the immediate project vicinity, which include the following: overhead and underground electric and gas, sanitary sewer, water, reclaimed water, television, telephone, and fiber optic. The details regarding needed utility realignment will not be available until a later stage of project planning. The realignments are anticipated to take place within the described construction footprint.

The overall project will also include the following components.

1. Installation of static or dynamic signs, electronic tolling equipment, and toll collection. Maintenance vehicle pullouts will also be established adjacent to these features.

2. Retrofit of existing California Highway Patrol observation areas.

3. Mainline restriping and widening.

4. Installation of ancillary components such as electrical power and communication conduits and traffic control devices. The conduits for electrical power and communication fiber will be along the road shoulder and will require trenching and/or horizontal directional drilling.

Access and Staging
Access will be gained directly off I-80 and staging will be limited to the I-80 road shoulder and existing interchanges. Off-site staging may occur in existing paved or gravel areas.

Site Clean-Up and Restoration
All construction-related materials including fencing will be removed after construction has been completed for each phase. Landscape areas used for access, staging, and work space will be

recontoured as needed and hydroseeded using a seed mix consisting of native annual and perennial forb and grass species. The seed mix will be limited to those species naturally occurring in Solano County. Seed will be derived from commercially available, Solano County ecotypes to maintain the genetic integrity of surrounding native plant populations and increase the likelihood that plants will adapted to local climatic conditions.

Hydroseed will be applied prior to installation of the erosion control netting in order to promote sufficient contact between germinating seedlings and the soil. Hydroseed will be applied between September 1st and December 31st, prior to the onset of winter rains to take advantage of natural precipitation. Hydroseeded areas will not be irrigated.

Schedule
Due to funding availability and scheduling, the West Segment portion of the project is likely to be constructed first. Construction may commence as early as fall 2016. The construction schedule for the East Segment is dependent on the availability of future funding.

Conservation Measures
Caltrans proposes to reduce adverse effects to the California red-legged frog by implementing the following measures:

1. Caltrans will compensate for the loss of California red-legged frog habitat with one of the following options:

    a. Account for the equivalent of 1.05 acres of high-quality habitat as part of a larger conservation easement for the California red-legged frog;

    b. Purchase of 1.05 acres of Service-approved California red-legged frog banking credits.

    c. Provision of funds to a conservation group for aid and support of California red-legged frog conservation.

2. Caltrans will submit to the Service the names and credentials of biologists who would conduct activities specified in the following measures.

3. A Worker Environmental Awareness Training (WEAT) program will be presented by a Service-approved biologist before the onset of construction within potential California red-legged frog habitat to explain to construction personnel how best to avoid the take of red-legged frogs. The biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for all contractors and construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where conservation measures are being implemented will be included as part of this program. Upon completion of the presentation, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

4. Prior to the initiation of the pre-construction survey, a relocation plan for California red-legged frogs found on the project site will be submitted to the Service for approval.

5. The Service-approved biologist will perform pre-construction surveys in suitable California red-legged frog habitat.

6. A Service-approved biologist will be present during initial ground disturbance of areas considered California red-legged frog habitat.

7. All construction pipes, culverts, or similar structures that are stored at the site within suitable California red-legged frog habitat for one or more nights will be either securely capped prior to storage or thoroughly inspected by the Service-approved biologist before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a California red-legged frog is discovered, the Service-approved biologist will move the animal to an approved location.

8. Adult and juvenile frogs captured by the Service-approved biologist will be relocated into appropriate habitat outside the work footprint but within the general vicinity of where they were found. The priority will be to move the frog out of harm's way but as close to the capture location as possible.

9. To prevent inadvertent entrapment of listed species during construction excavated holes or trenches more than 1 foot deep with walls steeper than 30 degrees will be covered at the close of each working day by plywood or similar materials. Alternatively, an additional 4-foot high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of listed species. If it is not feasible to cover an excavation or provide an additional 4-foot high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks shall be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape or the Service will be contacted by telephone for guidance. The Service will be notified of the incident by telephone and e-mail within 24 hours.

10. During project activities, food-related trash will be properly contained, removed from the work site, and disposed of daily. Following construction, all trash and construction debris will be removed from work areas.

11. No firearms will be allowed on the project site except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

12. No pets will be permitted on the project site.

13. The potential for adverse effects to water quality will be avoided by implementing temporary and permanent BMPs outlined in Section 7-1.01G of the Caltrans Standard Specifications. Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The State Water Resources Control Board has issued a National Pollution Discharge Elimination System Statewide Storm Water Permit to Caltrans to regulate storm water and non-storm water discharges from Caltrans facilities. A Storm Water Pollution Prevention Plan (SWPPP) will be developed for the project, as one is required for all projects that have at least 1.0 acre of soil disturbance. The SWPPP complies with the Caltrans Storm Water Management Plan (SWMP). The SWMP includes guidance for design staff to include provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges.

The SWPPP will reference the *Caltrans Construction Site BMPs Manual.* This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges and can be found at the following website: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

Protective measures will be included in the contract, including, at a minimum:

a. No discharge of pollutants from vehicle and equipment cleaning are allowed into the storm drain or water courses.

b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses.

c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.

d. Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require.

e. Coir rolls will be installed along or at the base of slopes during construction to capture sediment and temporary organic hydromulching will be applied to all unfinished disturbed and graded areas.

f. Work areas where temporary disturbance has removed the pre-existing vegetation will be restored and re-seeded with a native seed mix.

g. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls along toe of slopes or along edges of designated staging areas, and erosion-control netting (such as jute or coir) as appropriate.

14. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any aquatic habitat, culvert, or drainage feature.

15. Plastic monofilament netting (erosion control matting) or similar material will be prohibited from use on the project because California red-legged frog may become entangled or trapped in it.

Action Area

An action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed project, the action area for this project encompasses a 79.50-acre construction footprint (25.28 acres of hardscape + 54.22 acres of unpaved surface) plus a 300 foot habitat buffer. The action area beyond the construction footprint has the potential to be affected by noise, visual disturbance, barrier effects, and water quality.

Analytical Framework for the Jeopardy Determination

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

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

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

Analytical Framework for the Adverse Modification Determination

This BO does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this BO relies on four components: (1) the *Status of Critical Habitat*, which evaluates the range-wide condition of critical habitat for the California red-legged frog in terms of primary constituent elements (PCE)s, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role 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 and how that will influence the recovery role 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 recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the California red-legged frog critical habitat are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the California red-legged frog.

The analysis places an emphasis on using the intended range-wide recovery function of California red-legged frog critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

Status of the California Red-Legged Frog

Listing Status
The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Critical habitat was re-designated for this species on March 17, 2010 (Service 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description
The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

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

Status and Natural History
California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and man-made ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, California red-legged frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. California red-legged frogs also can be found in disturbed areas such as channelized creeks and drainage ditches in urban and agricultural areas. For example, an adult California red-legged frog was observed in a shallow isolated pool on North Slough Creek in the American Canyon area of Napa County (C. Gaber, PG&E, pers. comm., 2008). This frog location was surrounded by vineyard development. Another adult California red-legged frog was observed under debris in an unpaved parking lot in a heavily industrial area of Burlingame (P. Kobernus, Coast Ridge Ecology, pers. comm., 2008). This frog was likely utilizing a nearby drainage ditch. Caltrans also has discovered California red-legged frog adults, tadpoles, and egg masses within a storm drainage system within a major cloverleaf intersection of Millbrae Avenue and SR 101 in a heavily developed area of San Mateo County (Caltrans 2007). California red-legged frog

has the potential to persist in disturbed areas as long as those locations provide at least one or more of their life history requirements.

California red-legged frogs typically breed between November and April in still or slow-moving water at least 2.5 feet in depth with emergent vegetation, such as cattails, tules or overhanging willows (Hayes and Jennings 1988). There are earlier breeding records from the southern portion of their range (Storer 1925). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984). Individuals occurring in coastal areas are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold and dry seasons.

During other parts of the year, habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer (Fellers 2005). According to Fellers (2005), this can include vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees. Sometimes the non-breeding habitat used by California red-legged frogs is extremely limited in size. For example, non-breeding California red-legged frogs have been found in a 6-foot wide coyote brush thicket growing along a small intermittent creek surrounded by heavily grazed grassland (Fellers 2005). Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned structures, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

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

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

In a study of California red-legged frog terrestrial activity in a xeric environment, Tatarian (2008) noted that 57 percent of frogs fitted with radio transmitters in the Round Valley study area in eastern Contra Costa County stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. This study reported a peak of seasonal terrestrial movement occurring in the fall months, with movement commencing with the first 0.2 inch of precipitation. Movements away from the source pools tapered off into spring. Upland movement activities ranged

from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the bases of trees or rocks, logs, and a downed barn door; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from one to four days; however, an adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Uplands closer to aquatic sites were used more often and frog refugia were more commonly associated with areas exhibiting higher object cover (*e.g.*, woody debris, rocks, and vegetative cover). Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000-5,000 eggs are attached to vegetation below the surface and hatch after six to fourteen days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand results in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis three and a half to seven months following hatching and reach sexual maturity at two to three years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at three to four years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live eight to ten years (Jennings *et al.* 1992). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (*e.g.*, drought).

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

Metapopulation and Patch Dynamics

The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry predict that individual animals will exit patches at more "permeable" areas (Buechner 1987; Stamps *et al.* 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla

and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a "corridor" must be determined from the perspective of the animal (Forys and Humphrey 1996).

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

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

Most metapopulation or metapopulation-like models of patchy populations do not directly include the effects of dispersal mortality on population dynamics (Hanski 1994; With and Crist 1995; Lindenmayer and Possingham 1996). Based on these models, it has become a widely held notion that more vagile species have a higher tolerance to habitat loss and fragmentation than less vagile species. But models that include dispersal mortality predict the opposite: more vagile species should be more vulnerable to habitat loss and fragmentation because they are more susceptible to dispersal mortality (Fahrig 1998; Casagrandi and Gatto 1999). This prediction is supported by Gibbs (1998), who examined the presence-absence of five amphibian species across a gradient of habitat loss. He found that species with low dispersal rates are better able than more vagile species to persist in landscapes with low habitat cover. Gibbs (1998) postulated that the land between habitats serves as a demographic "drain" for many amphibians. Furthermore, Bonnet *et al.* (1999) found that snake species that use frequent long-distance movements have higher mortality rates than do sedentary species.

Threats

Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern

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

The urbanization of land within and adjacent to red-legged frog habitat has also adversely affected California red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs.

Diseases may also pose a significant threat though the specific effects of diseases on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Chytridiomycosis and ranaviruses are a potential threat to the red-legged frog because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al.* 2003; Lips *et al.* 2003). Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2005). Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (*i.e.*, contaminated boots or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease. Disease will likely become a growing threat because of the relatively small and fragmented remaining California red-legged frog breeding sites, the many stresses on these sites due to habitat losses and alterations, and the many other potential disease-enhancing anthropogenic changes that have occurred both inside and outside the species' range.

Negative effects to wildlife populations from roads and pavement may extend some distance from the actual road. The phenomenon can result from any of the effects already described in this BO, such as vehicle-related mortality, habitat degradation, and invasive exotic species. Forman and Deblinger (1998, 2000) described the area affected as the "road effect" zone. Along a four-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1,970 feet. They describe the boundaries of this zone as asymmetric and in some areas diminished wildlife use attributed to road effects was detected greater than 0.6 mile from Massachusetts Route 2. The "road-zone" effect can also be subtle. Van der Zande *et al.* (1980) reported that lapwings and black-tailed godwits feeding at 1,575-6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep increase near roads (MacArthur *et al.* 1979). Trombulak and Frissell (2000) described another type of "road-zone' effect due to contaminants. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, but elevated levels of metals in both soil and plants were detected at 660 feet of roads. The "road-zone" apparently varies

with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1,000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road-zone" effect with regard to California red-legged frogs has not been adequately investigated.

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

Status of the California Red-Legged Frog Critical Habitat

Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)). The Service is required to list the known PCE's together with the critical habitat description. Such physical and biological features include, but are not limited to, the following:

1. Space for individual and population growth, and for normal behavior;

2. Food, water, air, light, minerals, or other nutritional or physiological requirements;

3. Cover or shelter;

4. Sites for breeding, reproduction, rearing of offspring, or dispersal; and

5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (71 FR 19244) (Service 2006) and a revised designation to the critical habitat was published on March 17, 2010 (75 FR 12816) (Service 2010).

The PCE's defined for the California red-legged frog provide aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PCE's and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCE's essential to the conservation of the California red-legged frog are:

1. *Aquatic Breeding Habitat.* Standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.

2. *Non-Breeding Aquatic Habitat.* Freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.

3. *Upland Habitat.* Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or riparian plant species that provide the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter.

4. *Dispersal Habitat.* Accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other that allow for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified by PCE's 1, 2, or 3 as essential to the conservation of the subspecies.

With the revised designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the PCE's sufficient to support the life-history functions of the species. Because not all life-history functions require all the PCE's, not all areas designated as critical habitat will contain all the PCE's. Refer to the final designation of critical habitat for California red-legged frog for additional information (75 FR 12816).

Environmental Baseline for the California Red-Legged Frog

Like most of the State's highways, I-80 was constructed long before the establishment of the NEPA (1969), the Act (1973), or the California Environmental Quality Act (1970); as well as the Federal listing of the California red-legged frog (1996), or our current understanding regarding the effects roads have on wildlife and how roads can be designed to minimize those effects.

The land adjacent to the proposed project is influenced by the use of the I-80 transportation corridor. The ROW includes several associated features such as vehicle pullouts, overhead utilities, road signs, concrete median barriers, bridges, access ramps, truck scales, fencing, and landscape subject to vegetation maintenance. These physical features along with high traffic volume, traffic noise, exhaust, invasive vegetation, and the threat of animal-vehicle collision have an adverse effect on the function of the neighboring habitat for both common and listed wildlife. This parallel band of disturbance is referred to as a "road effects zone". The outward extent of this zone can vary with factors such as topography and the sensitivity of a given species to those effects. A spectrum of typical road effects are likely to negatively influence the suitability of the California red-legged frog habitat in and adjacent to the project footprint as well as the behavior of the species within its road effects zone.

The habitat and species utilizing it is less influenced by I-80 with distance from the edge of the road shoulder. The outside of the ROW is less influenced by maintenance activities and the adjacent land beyond the Caltrans ROW is developed, grazed, or unmanaged. Portions of the action area are adjacent to bands of habitat as well as large expanse of relatively contiguous habitat for the California red-legged frog.

The action area is located with the range of the California red-legged frog. A map depicting the species' range is included in the Service's online profile for the species at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D.

The action area is also within California red-legged frog's North Coast and North San Francisco Bay Recovery Unit (Unit 3) (Service 2002). The western, approximately 0.4 mile of the project, between the railroad crossing and Red Top Road, is within Jameson Canyon Lower Napa River Core Area (Core Area 15).

I-80 is a primary dividing feature for defining the boundaries of the three critical habitat units within Solano County. Although not within designated critical habitat, the western end of the project footprint is within approximately 390 feet of the SOL-2 Unit, 130 feet of SOL-3, and 80 feet of SOL-1.

Caltrans conducted Service-protocol surveys within the proposed action area during the spring and summer of 2012. The survey visits focused on 18 aquatic habitat locations identified within the action area by Caltrans as a result of their 2012 habitat assessment. As a result of the surveys, an

adult California red-legged frog was observed immediately adjacent to the Jameson Canyon Creek culvert, north of I-80 on July 17, 2012 [California Natural Diversity Database (CNDDB occurrence 1395]. The frog was observed approximately 60 feet from the outside edge of the existing I-80 road shoulder and the species identification was verified with a photograph of the animal. The frog's location was outside the proposed project footprint but within the described action area. The Service visited the site and observed an American bullfrog at the same location. At the time of the visit, the area in which the California red-legged frog was observed was influenced by a nearby homeless encampment. The Service observed signs of frequent human traffic within the riparian zone, including trash and evidence that the creek had been used for bathing, cleaning, and discharge of material that would adversely affect water quality and the health of wildlife. Caltrans subsequently removed the encampment and cleaned up a portion of the associated trash.

The action area includes and is also in accessible proximity to various habitat features associated with California red-legged frog and recorded red-legged frog observations throughout its length. Species occurrences in rural areas are often discovered as a result of investigations for proposed development projects and there have been inadequate past surveys to characterize the species' occupancy of the general area. There are no CNDDB California red-legged frog records within 2 miles of the East Segment (CDFW 2015). The CNDDB indicates at least six California red-legged frog locations within 1 mile of the West Segment (occurrences 402, 1395, and four clustered observations under 660). These observations are located on the western end of the West Segment and most are the result of recent surveys; three of these records are less than 0.25 mile from the project footprint. The Service is aware of three additional observations in this vicinity. These include two frogs found on the Azevedo property, adjacent to Lynch Canyon Open Space (approximately 0.95 mile away) and another on the Caltrans' Ferrrari Ranch California red-legged frog compensation property (approximately 0.35 mile away).

The 18 mile long length of I-80 is adjacent to urban development, cropland, and open habitat. The Eastern Segment links the urban areas of Vacaville and Fairfield. The land adjacent to the approximately 3.6 miles of I-80 in-between the two cities is primarily an undeveloped expanse of open land characterized by rolling grassland, oak woodland, and ephemeral creeks with an associated riparian corridor. The habitat is compatible with the life history needs of the California red-legged frog but there is no known occurrence data in the vicinity. The Service considers this area to be potential habitat for the listed frog and typically recommends that applicants perform protocol surveys of potential California red-legged frog habitat as part of an effects analysis. Caltrans conducted the protocol surveys which yielded negative results.

There is both potential and occupied California red-legged frog habitat adjacent to the approximately 8.1 mile long, West Segment. Within this segment, the eastern, approximately 7.1-miles of I-80 from Air Base Parkway to the SR 12 West interchange is flanked by urban development and plowed fields. Within this area the potential California red-legged frog habitat is likely limited to the Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings. The remaining mile at the western end is adjacent to occupied upland and aquatic habitat.

The road effects zone applies to the California red-legged frog and in this case, I-80 is a barrier to north and south movement due to road mortality and obstructions such median barriers. Road mortality is likely for frogs given the proximity of occupied habitat immediately adjacent to I-80 at the western end of the project. These baseline conditions likely create a risk for California red-legged frog that diminishes with distance from the I-80 travel corridor.

The Service believes that the California red-legged frog is reasonably certain to occur within the action area due to: (1) the project being located within the species' range and current distribution; (2) the presence of suitable upland and aquatic habitat in the action area; (3) observations of the species within the action area; (4) all the elements needed to support the species' life history are located within 0.5-mile of the action area; (5) the frog's ability to move long distances; and (6) the biology and ecology of the animal.

Environmental Baseline for the California Red-Legged Frog Critical Habitat

I-80 is a primary dividing feature for defining the boundaries of the three critical habitat units within Solano County. Although not within designated critical habitat, the western end of the construction footprint is within approximately 80 feet of SOL-1 Unit, 250 feet of the SOL-2, and 104 feet of SOL-3. The action area includes a 300 foot buffer surrounding the construction footprint and therefore portions of each of the three SOL units are within the defined action area. Approximately 15.63 acres of SOL-1, 0.23 acre of SOL-2, and 13.76 acres of SOL-3 are contained within the buffer.

SOL-1 comprises approximately 11,971 acres in southwestern Solano County and a portion of extreme southeastern Napa County, south of Interstate 80 and west of Interstate 680. The unit contains aquatic habitat for breeding and non-breeding activities (PCE 1 and PCE 2), and upland habitat for foraging and dispersal activities (PCE 3 and PCE 4). The unit consists entirely of private land.

SOL-2 comprises approximately 3,360 acres in southwestern Solano County and a portion of extreme southeastern Napa County, south of I-80 and west of I-680. The unit contains high-quality permanent and ephemeral aquatic habitats (PCE 1 and PCE 2) consisting of stream and plunge pools as well as large freshwater marsh surrounded by open grassland, willow, and oak that provide for breeding, and upland areas (PCE 3 and PCE 4) for dispersal, shelter, and foraging. The unit consists entirely of private land.

SOL-3 comprises approximately 4,597 acres in southwestern Solano County and a portion of extreme southeastern Napa County, north of I-80 and south of SR 12W. The unit contains high-quality permanent and ephemeral aquatic habitats (PCE 1 and PCE 2), consisting of pools, stream, and spring habitat surrounded by riparian tree species and annual grasslands that provide for breeding, and upland areas for dispersal, shelter, and foraging (PCE 3 and PCE 4). The unit consists of 1,087 acres of local nonprofit ownership and 3,510 acres of private land.

The designation of both units is expected to prevent further fragmentation of habitat in this portion of the species' range and represents the southern extent of the species in the interior Coast Range north of the Suisun Bay. The physical and biological features essential to the conservation of California red-legged frog in all three SOL units may require special management considerations or protection due to overgrazing of aquatic and riparian habitats, and removal and alteration of habitat due to urbanization, which may alter or eliminate aquatic or upland habitats and thereby result in the direct or indirect loss of egg masses or adults.

Effects of the Action on the California Red-Legged Frog

The direct effects of the proposed project are those effects occurring within the action area during construction of the project. For this project, many of the direct effects will be associated with the loss of habitat for the California red-legged frog. The effects of habitat loss were analyzed based on

the term of the loss, restoration potential, and the associated changes to functional value. As a result, habitat loss was characterized as permanent or temporary.

Permanent habitat loss is defined as those areas that will be converted to hardscape as a result of the project. Hardscape can retain some functional use. For instance, frogs may still be able to move across these areas but generally cannot use them for breeding, feeding, or sheltering. Conversion of landscape to hardscape is dramatic and because there will be no restoration to baseline, is considered permanent.

Temporary habitat loss refers to any landscape cover that will be restored to baseline habitat values (for the given species) within one year following the initial disturbance. This short term habitat loss typically applies to habitat types dominated by annual plant species or landscape features such as a riverbed are often that can be quickly restored to baseline. For this project this includes grassland cover and seasonal drainage.

Indirect effects are the effects of the project generally occurring later in time after construction has been completed (*e.g.*, degradation of habitat due to the spread of invasive plant species; barriers to dispersal due to the installation of retaining walls). An interrelated activity is an activity that is part of the project and depends on the project for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation.

Caltrans proposes to minimize construction related effects by implementing the *Conservation Measures* included in the project description section of this BO. Effective implementation of *Conservation Measures* will likely minimize effects to the California red-legged frog during construction but incidental take is still likely to occur. Therefore, the proposed project has the potential to result in a variety of adverse effects to the California red-legged frog.

Based on the location within the current known range of the species, and our current knowledge of occupied habitat, we accept Caltrans' survey results as an indication that the California red-legged frog is unlikely to be adversely affected by the activities associated with the East Segment. Adverse effects in the Western Segment will likely be associated with activities in and adjacent to the Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange.

Construction activities could result in the killing, harming and/or harassment of juvenile and adult frogs in the action area. Based on the information provided by Caltrans on July 22, 2015, the proposed project would result in the permanent loss of 0.10 acre and temporary loss of 3.24 acres of California red-legged frog habitat. Affected habitats include grassland, scrub, and seasonal drainage land cover. However, portions of this construction area have been analyzed as part of areas previously disturbed by the I-80/I-680/SR 12 Interchange Phase 1 Project (Service File 81420-2009-F-0857) and the I-80 Eastbound Cordelia Truck Scales Relocation Project (Service File 81420-2008-F-1929). Habitat loss unique to the I-80 Express Lanes Project will be limited to 0.03 acre of permanent loss and 0.96 acre of temporary loss.

Vegetation clearing will result in the loss of dense annual plant cover, resulting in increased exposure and decreased moisture. This could affect the movement and available cover sites for amphibians. Removal of vegetation will result in the loss of cover from predators and the elements. The ground disturbance associated with vegetation removal may result in exposure, stranding, crushing, maiming, or otherwise harassing or harming the California red-legged frog. The noise and vibration associated with the vegetation removal will be disruptive and may result in California red-legged

frogs avoiding the action area, therefore modifying their behavior and dissuading their movement to other resource areas. Noise and vibration may also result in California red-legged frogs taking cover in conspicuous areas rather than fleeing potential harm. This will make them more difficult to find, avoid, and rescue from harm's way.

Effectively educating project personnel will encourage compliance with the conservation measures and increase the possibility that California red-legged frogs in the work area will be identified and addressed appropriately for avoidance.

Pre-construction surveys by a Service-approved biologist will assist in clearing California red-legged frogs from the work areas prior to the introduction of a potential construction-related threat. Biological clearance of work areas prior to the start of each day's work and during construction will increase the chances of identifying frogs in the work area that would be susceptible to injury. Biological clearance of work areas is limited by the complexity and abundance of potential cover sites, the small size and inconspicuous nature of the species, and the challenges of completing a thorough clearance given the construction schedule.

Despite being "cleared" prior to construction, California red-legged frogs can continue to move into the work site undetected. The project is adjacent to occupied upland and aquatic habitat in which frogs would routinely move through as well as back and forth from the adjacent upland. The lack of proposed exclusion fencing to deter frogs from entering active construction zones paired with the lack of proposed biological clearance of equipment and work areas at the beginning of each day could lead to harm and harassment of frogs that may have entered the work area following the initial pre-construction survey. Proper trash disposal is often difficult to enforce and is a common non-compliance issue. Improperly disposed edible trash could attract predators, such as raccoons, crows, and ravens, to the site, which could subsequently prey on the listed frog.

If unrestricted, biologists and construction workers traveling to the action area from other project sites may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytridiomycosis, caused by chytrid fungus, may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (*e.g.*, water pH) that reduce normal immune response capabilities (Bosch *et al.* 2001, Weldon *et al.* 2004).

Discovery, capture, and relocation of individual California red-legged frogs may avoid injury or mortality due to construction activities; however, capturing and handling animals may result in stress and/or inadvertent injury during handling, containment, and transport.

Caltrans' commitment to use erosion control devices other than mono-filament should be effective in avoiding the associated risk of entrapment that can result in death by predation, starvation, or desiccation (Stuart *et al.* 2001).

California red-legged frogs and their prey could also be affected by contamination due to chemical or sediment discharge. Exposure pathways could include inhalation, dermal contact, direct ingestion, or secondary ingestion of contaminated soil, plants or prey species. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. However, Caltrans proposes to reduce these risks by implementing BMPs and the SWPPP.

The project additions in the identified areas of occupied and potential frog habitat are unlikely to increase the local risk of California red-legged frog mortality from vehicle collision. The road effects zone described in the baseline section would likely expand into nearby habitat in correlation with the expansion of the roadway infrastructure.

Effective restoration of the areas needed for access and work space is expected to reestablish baseline grassland habitat values for the California red-legged frog within a year of project completion. Caltrans' compensation options will help offset the adverse effects of the project because in-perpetuity conservation would be acquired within occupied and functional habitat subject to appropriate long-term management, or funds will be used to implement a recovery action or other beneficial actions for the species. Either option should be implemented in Solano County to benefit the local frog population. Caltrans' previous action to remove the homeless encampment along Jameson Canyon Creek is a good example of a local measure that likely enhanced occupied California red-legged frog habitat. Restoration of temporary work areas will provide continued functional habitat for the species.

Effects of the Action on California Red-Legged Frog Critical Habitat

Collectively there are 29.62 acres of California red-legged frog critical habitat within the action area. This area is located outside the construction footprint and therefore will not be subject to vegetation removal or ground disturbance. This area is within the 300 foot buffer surrounding the construction footprint that has the potential be adversely affected by other issues such as noise, visual disturbance, barrier effects, and water quality.

The four PCEs for the critical habitat (PCE 1-aquatic breeding, PCE 2- non-breeding aquatic, PCE 3-upland, and PCE 4- dispersal habitat) are physical habitat features that are unlikely to be adversely modified by noise and visual cues associate with nearby construction. The project includes standardized measures to protect water quality and avoid adverse modification of aquatic habitat within the units. Given the baseline condition, the construction activities and the completed project are not expected to result in an adverse effect to connectivity and are therefore unlikely to adversely modify the dispersal habitat within or between the critical habitat units.

For purposes of the adverse modification determination, the effects on California red-legged frog critical habitat is evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales. As described above, the proposed project is unlikely to adversely modify the local units or the range-wide recovery role and functions of overall California red-legged frog critical habitat designation.

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 I-80 Express Lanes Project are not considered in this section because they require separate consultation pursuant to section 7 of the Act. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area of the proposed project.

Conclusion

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the I-80 Express Lanes Project, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog. We base this conclusion on the following: (1) the proposed activities in or adjacent to occupied and potential frog habitat are limited in scope; (2) successful implementation of the described *Conservation Measures* is likely to reduce the potential for proposed project activities to result in the disruption of normal California red-legged frog behavior or risk of injury; (3) habitat disturbed for access and work space will be restored to baseline levels; (4) the ground disturbing activities and new infrastructure will be located within and adjacent to the existing roadway; and (5) Caltrans will partially offset habitat loss with in-perpetuity habitat acquisition and management or allocation of funds for a beneficial action.

After reviewing the current status of designated critical habitat for the California red-legged frog, the environmental baseline for the action area, the effects, and the cumulative effects, it is the Service's biological opinion that the I-80 Express Lanes Project, as proposed, is not likely to destroy or adversely modify designated critical habitat. The Service reached this conclusion because the project-related effects to the designated critical habitat, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function of the critical habitat to serve its intended conservation role for the California red-legged frog. The critical habitat within the action area is located beyond the proposed construction footprint and the adverse effects associated with the project will likely be limited to behavioral issues, not physical changes to the PCEs. Therefore they are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of the California red-legged frog.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act 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. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this *Incidental Take Statement.*

The measures described below are non-discretionary, and must be undertaken by Caltrans so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document,

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 the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect due to their small size, wariness, and cryptic nature. The project footprint includes vegetative cover, rocks, and debris which provide cover for the California red-legged frog. Finding an injured or dead California red-legged frog is unlikely due to their relatively small body size, rapid carcass deterioration, and likelihood that the remains will be removed by a scavenger or indistinguishable amongst the disturbed soil and debris. Losses of the California red-legged frog may also be difficult to quantify due to seasonal/annual fluctuations in their numbers due to environmental or human-caused disturbances. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent loss/degradation of suitable habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental to the proposed action as: (1) the harassment of all California red-legged frogs within the Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange plus a 300 foot action area buffer; (2) the capture of all California red-legged frogs within the construction footprint of the Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange; and (3) the injury or mortality of one adult or juvenile California red-legged frog.

Upon implementation of the following *Reasonable and Prudent Measures*, the incidental take of California red-legged frogs within the action area in proportion to the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are exempted under this opinion.

Effect of the Take

In the accompanying BO, the Service determined that this level of anticipated take for the California red-legged frog is not likely to result in jeopardy to the species.

Reasonable and Prudent Measure

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize the effect of the action on the California red-legged frog. Caltrans will be responsible for the implementation and compliance with this measure:

1. Minimize the adverse effects to the California red-legged frog and their habitat in the action area by implementing their proposed project, including the conservation measures as described, with the following terms and conditions.

Terms and Conditions

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

1. The following *Terms and Conditions* implement *Reasonable and Prudent Measure* one (1):

a. Caltrans shall include language in their contracts that expressly requires contractors and subcontractors to work within the boundaries of the project footprint identified in this BO, including staging and access.

b. Permits. Caltrans shall include a copy of the all relevant permits within the construction bid package of the proposed project. The Resident Engineer or their designee shall be responsible for implementing the *Conservation Measures* and *Terms and Conditions* of the BO.

c. Caltrans' elected compensation option shall be presented to the Service for review and approval prior to dedication of the associated funding. The preservation of California red-legged frog habitat through purchase of credits at a conservation bank must minimize the effects of habitat loss. The proposed bank must provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the project. The compensation shall be submitted for Service approval within 6 months prior to the start of the first project phase and must be satisfied prior to completion of that phase.

d. At least 15 days prior to the onset of any construction-related activities covered in this consultation, Caltrans shall submit to the Service, for approval, the name(s) and credentials of biologists it wishes to conduct activities specified for this project. Information included in a request for authorization should include, at a minimum: (1) relevant education; (2) relevant training concerning California red-legged frog identification, survey techniques, handling individuals of different age classes, and handling of different life stages by a permitted biologist or recognized species expert authorized for such activities by the Service; (3) a summary of field experience conducting requested activities (to include project/research information); (4) a summary of BOs under which they were authorized to work with the California red-legged frog and at what level (such as construction monitoring versus handling), this should also include the names and qualifications of persons under which the work was supervised as well as the amount of work experience on the actual project; (5) A list of Federal Recovery Permits [10(a)1(A)] held or under which are authorized to work with the California red-legged frog (to include permit number, authorized activities, and name of permit holder); and (6) any relevant professional references with contact information. No project construction shall begin until Caltrans has received written Service approval for biologists to conduct specified activities.

e. The *Conservation Measures* and the construction-related *Terms and Conditions* shall be implemented in the Western Segment for activities within at least 300 feet of Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange.

f. Pre-construction surveys for the California red-legged frog shall be conducted no more than 20 calendar days prior to any ground disturbance within at least 300 feet of Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange. Pre-construction surveys will be conducted by the Service-approved biologist. These surveys will consist of walking surveys of the project limits and, if possible, accessible adjacent areas within at least 50 feet of the project limits. The biologist will investigate potential cover sites when it is

feasible and safe to do so. This includes thorough investigation of mammal burrows, appropriately sized soil cracks, and debris.

g. The Service-approved biologist(s) shall perform a California red-legged frog clearance survey immediately prior to the initial ground disturbance within at least 300 feet of Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange. Safety permitting, the Service-approved biologist(s) shall investigate areas of disturbed soil for signs of the listed species within 30 minutes following the initial disturbance of that given area.

h. The Service-approved biologist shall be on-site during initial ground-disturbing activities within at least 300 feet of Ledgewood Creek, Suisun Creek, and Green Valley Creek crossings and the last mile of the project, west of the SR 12 West Interchange, and thereafter as needed to fulfill the role of the approved biologist as specified in project permits. The biologist shall keep copies of applicable permits in their possession when on-site. Through the Resident Engineer or their designee, the Service-approved biologist(s) shall be given the authority to communicate either verbally, by telephone, e-mail, or hardcopy with all project personnel to ensure that take of listed species is minimized and permit requirements are fully implemented. Through the Resident Engineer or their designee, the Service-approved biologist shall have the authority to stop project activities to minimize take of listed species or if they determine that any permit requirements are not fully implemented. If the Service-approved biologist exercises this authority, the Service shall be notified by telephone and e-mail within 24 hours.

i. The Resident Engineer will immediately contact the Service-approved biologist in the event that a California red-legged frog is observed within the action area. The Resident Engineer shall suspend construction activities within a 50-foot radius of the animal until the animal leaves the site voluntarily or is relocated by the Service-approved biologist.

j. The Service-approved biologist shall conduct clearance surveys at the beginning of each day within or adjacent to suitable listed species habitat and regularly throughout the workday.

k. The Service-approved biologist(s) shall permanently remove, from the project site, any aquatic exotic wildlife species, such as bullfrogs and crayfish, to the extent possible.

l. The Service-approved biological monitor shall halt work immediately and contact the Service in the event that a California red-legged frog is found within the construction zone. The biological monitor shall suspend all construction activities in the immediate construction zone until the animal leaves the site voluntarily or is removed by the biologist to a release site using Service-approved transportation techniques.

m. Rodenticides shall not be used at the project site. Herbicides shall only be used if needed to control noxious weeds.

n. Each California red-legged frog encounter shall be treated on a case-by-case basis in coordination with the Service but general guidance is as follows: (1) leave the non-injured animal if it is not in danger or (2) move the frog to a nearby location if it is in danger.

These two options are further described as follows:

1) When a California red-legged frog is encountered in the action area the first priority is to stop all activities in the surrounding area that have the potential to result in the harm, harassment, injury, or death of the individual. Then the monitor needs to assess the situation in order to select a course of action that will minimize adverse effects to the individual. Contact the Service once the site is secure. The contacts for this situation are Ryan Olah (*ryan_olah@fws.gov*) or John Cleckler (*john_cleckler@fws.gov*). They can also be reached at (916) 414-6600. If you get voicemail messages for these contacts then contact John Cleckler on his cell phone at (916) 712-6784. Contact the Service prior to the start of construction to confirm the status of this contact information.

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

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

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

   If appropriate habitat is located immediately adjacent to the capture location then the preferred option is short distance relocation to that habitat. This must be coordinated with the Service but the general guidance is the frog should not be moved outside of the area it would have traveled on its own. Captured frogs should in appropriate cover as close to their capture location as feasible possible for their continued safety. Under no circumstances should a frog be relocated to another property without the owner's written permission. It is Caltrans' responsibility to arrange for that permission.

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

   Only Service-approved biologists for the project can capture California red-legged frogs. Nets or bare hands may be used to capture California red-legged frogs. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within 2 hours before and during periods when they are capturing and

relocating California red-legged frogs. To avoid transferring disease or pathogens between sites during the course of surveys or handling of amphibians, Service-approved biologists must use the following guidance for disinfecting equipment and clothing. These recommendations are adapted from the *Declining Amphibian Population Task Force's Code* (http://www.open.ac.uk/daptf/).

i. All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, must be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water and/or an amphibian. Cleaned items should be rinsed with fresh water before leaving each site.

ii. Boots, nets, traps, etc., must then be scrubbed with either a 70 percent ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT 128 (quaternary ammonium, use 1:60 dilution), or a 6 percent sodium hypochlorite 3 solution and rinsed clean with water between sites. Avoid cleaning equipment in the immediate vicinity of a pond or wetland. All traces of the disinfectant must be removed before entering the next aquatic habitat.

iii. Used cleaning materials (liquids, etc.) must be disposed of safely, and if necessary, taken back to the lab for proper disposal.

iv. Service-approved biologists must limit the duration of handling and captivity. While in captivity, California red-legged frogs shall be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for holding or transporting should not contain any standing water.

o. Caltrans shall provide a restoration and revegetation plan for the project to be reviewed and approved by the Service no later than sixty (60) calendar days prior to the initial groundbreaking at the project site. The plan will include, but will not be limited to: schedule, methodology, a list of the seed mixes and container plants, plant material source, irrigation, maintenance schedule, monitoring program, success criteria, control of invasive, noxious weeds, reestablishment of overhanging vegetation, and remediation and adaptive management. The planting assemblage will include native trees, shrubs, and vines appropriate for the riparian corridor. A revegetation status and success report will be submitted on or before December 31 of each year monitoring is conducted.

p. If requested, before, during, or upon completion of groundbreaking and construction activities, Caltrans shall allow access by Service personnel into the project footprint to inspect the project and its activities.

q. *Reporting Requirements.* In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, Caltrans shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, Caltrans must immediately reinitiate formal consultation as per 50 CFR 402.16.

1) For those components of the action that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, Caltrans shall provide weekly (or some other appropriate timeframe) updates to the Service with a precise accounting of the total acreage of habitat impacted. Updates shall also include any information about changes in project implementation that result in habitat disturbance not described in the *Project Description* and not analyzed in this BO.

2) For those components of the action that may result in direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harassment, harm, injury, or death is anticipated, Caltrans shall immediately contact the Service's Sacramento Fish and Wildlife Office (SFWO) at (916) 414-6600 to report the encounter. If encounter occurs after normal working hours, Caltrans shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, Caltrans shall follow the steps outlined in the Salvage and Disposition of Individuals section below.

3) For those components of the action that will require the capture and relocation of any listed species, Caltrans shall immediately contact the SFWO at (916) 414-6600 to report the action. If capture and relocation need to occur after normal working hours, Caltrans shall contact the SFWO at the earliest possible opportunity the next working day.

4) Sightings of any listed or sensitive animal species should be reported to the CNDDB (http://www.dfg.ca.gov/biogeodata/cnddb/).

5) Construction compliance reports shall be addressed to the Coast-Bay Division Chief of the Endangered Species Program at the SFWO.

6) Caltrans shall submit post-construction compliance reports prepared by the Service-approved biologist to the Service within 60 calendar days following completion of each construction season or within 60 calendar days of any break in construction activity lasting more than 60 calendar days. This report shall detail (1) dates that relevant project activities occurred; (2) pertinent information concerning the success of the project in implementing avoidance and minimization measures; (3) an explanation of failure to meet such measures, if any; (4) known project effects on the California red-legged frog; (5) occurrences of incidental take of any listed species; (6) documentation of employee environmental education; and (7) other pertinent information.

r. Salvage and Disposition of Individuals. Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact persons are the Coast-Bay Division Chief of the Endangered Species Program at the SFWO at (916) 414-6600.

CONSERVATION RECOMMENDATIONS

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

1. The Service recommends that Caltrans place plywood cover boards in conjunction with exclusion fencing to provide refugia for listed species that may become stranded or otherwise disoriented by the barrier. Cover boards can also be placed in areas where their use by the frog would decrease the potential for them using equipment or other project-related items for cover.

2. Caltrans District 4 should work with the Service to develop a conservation strategy that would identify the current safe passage potential along Bay Area highways and the areas where safe passage for wildlife could be enhanced or established.

3. Caltrans should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California Red-legged Frog* (Service 2002).

4. Caltrans should consider participating in the planning for a regional habitat conservation plan for the California red-legged frog, other listed species, and sensitive species.

5. Caltrans should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California red-legged frog in Solano County. Such banking systems also could be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate. Efforts should be made to preserve habitat along roadways in association with wildlife crossings.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the I-80 Express Lanes Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if 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; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

If you have questions concerning this BO, please contact John Cleckler, Caltrans Liaison (*john_cleckler@fws.gov*) or Ryan Olah, Coast-Bay Division Chief (*ryan_olah@fws.gov*), at the letterhead address, (916) 414-6600, or by e-mail.

Sincerely,

Jennifer M. Norris
Field Supervisor

cc:
Melissa Escaron, California Department of Fish and Wildlife, Napa, California
Christopher States and Christopher Herbst, Caltrans District 4, Oakland, California

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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

October 18, 2013

In response refer to:
2013-9731

Amy Bailey, Chief
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P.O. Box 942874
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Lieutenant Colonel John K. Baker, Commander and District Engineer
United State Army Corps of Engineers
San Francisco District Headquarters
1455 Market Street
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Dear Ms. Bailey and Colonel Baker:

Thank you for your December 6, 2010, letter requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.*), for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 (Program), located in northern and central California. Effective October 1, 2012, the California Department of Transportation (Caltrans) is now acting as the lead agency as per the Memorandum of Understanding (MOU) between the Federal Highway Administration (FHWA) and Caltrans pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21). This law allows the Secretary of Transportation to assign, and Caltrans to assume, responsibility for the environmental review, consultation, or other actions required under any environmental law with respect to one or more highway projects within the state of California where Caltrans uses money from FHWA. The MOU is an extension of previous agreements between FHWA and Caltrans in 2007 and 2010 under a similar law. In addition, the United States Army Corps of Engineers (Corps) proposes to permit a subset of these activities and has also participated in ESA consultation on this project.

This letter transmits NMFS' biological opinion for Caltrans' use of FHWA funding for the Routine Maintenance and Repair Activities Program, and the Corps permits for these activities. Caltrans will act as the lead Federal action agency for ESA section 7 consultation when FHWA money will be used. Where FWHA money is not used, the Corps will be the Federal Action Agency for section 7 consultation (and Caltrans will be the applicant as defined by 50 CFR 402.02). In the enclosed biological opinion (Enclosure 1), NMFS analyzes the effects of the

proposed Program on the threatened Southern Oregon/Northern California Coast coho salmon (*Oncorhynchus kisutch*) Evolutionarily Significant Unit (ESU), endangered Central California Coast coho salmon ESU, threatened California Coastal Chinook salmon *(O. tshawytscha)* ESU, endangered Sacramento River Winter-run Chinook salmon ESU, threatened Central Valley Spring-run Chinook salmon ESU, threatened Northern California steelhead (*O. mykiss*) Distinct Population Segment (DPS), threatened Central California Coast steelhead DPS, threatened South-Central California Coast steelhead DPS, threatened California Central Valley steelhead DPS, threatened Southern DPS of North American green sturgeon (*Acipenser medirostris*), and threatened Southern DPS of Pacific eulachon (*Thaleichthys pacificus*). The biological opinion also analyzes the effects of the Program on the designated critical habitats of the species listed above.

Based on the best available information, NMFS concludes (in the enclosed biological opinion) that Caltrans' Routine Maintenance and Repair Activities Program may affect but is not likely to jeopardize the continued existence of the species listed above, and is not likely to result in the destruction or adverse modification of their critical habitats. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-discretionary terms and conditions for Caltrans and the Corps that are expected to minimize the impacts of incidental take of the species listed above as a result of implementing Program activities. In addition, ESA section 7(a)(1) conservation recommendations are provided in the enclosed biological opinion.

This letter also transmits NMFS' Essential Fish Habitat (EFH) consultation pursuant to section 305(b) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA). Activities authorized under the Program will occur in freshwater habitats identified as EFH for Pacific salmon, which are managed under the Pacific Coast Salmon Fishery Management Plan. In Enclosure 2, NMFS concludes Caltrans' Routine Maintenance and Repair Activities Program in freshwater habitats within Caltrans Districts 1, 2, and 4, would 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 in freshwater habitats. Therefore, NMFS has no EFH Conservation Recommendations to provide to Caltrans or the Corps at this time.

If you have any questions regarding these consultations, please contact Mr. Joe Heublein at (707) 575-1251 or joe.heublein@noaa.gov, Mr. Joel Casagrande at (707) 575-6016, or joel.casagrande@noaa.gov or Mr. Chuck Glasgow at (707) 825-5170 or chuck.glasgow@noaa.gov. For questions regarding EFH, please contact Ms. Korie Schaeffer at (707) 575-6087, or korie.schaeffer@noaa.gov.

Sincerely,

For William W. Stelle, Jr.
Acting Regional Administrator

Enclosures (3)

cc: Chris Yates, NMFS, Long Beach
John Cleckler, USFWS, Sacramento
Jerry Roe, USFWS, Sacramento
Richard Macedo, CDFW, Cobb
Melissa Escaron, CDFW, Yountville
Paula Gill, Corps, San Francisco
Administrative File: 151422SWR2011AR00495

Enclosure 1

BIOLOGICAL OPINION

ACTION AGENCIES:	California Department of Transportation (Caltrans) and U.S. Army Corps of Engineers (Corps)
ACTION:	Caltrans' Routine Maintenance and Repair Activities in Districts 1, 2, and 4, and individual Corps permits for these activities
CONSULTATION CONDUCTED BY:	National Marine Fisheries Service, Southwest Region
TRACKING NUMBER:	2013-9731
DATE ISSUED:	**October 18, 2013**

I. CONSULTATION HISTORY

Effective October 1, 2012, California Department of Transportation (Caltrans) assumed responsibility for consultation under section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.), as per the Memorandum of Understanding (MOU) between the Federal Highway Administration (FHWA) and Caltrans pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21). This law allows the Secretary of Transportation to assign, and Caltrans to assume, responsibility for the environmental review, consultation, or other actions required under any environmental law with respect to one or more highway projects within the state of California that FHWA funds. The MOU is an extension of previous agreements between FHWA and Caltrans in 2007 and 2010 under a similar law.

On December 6, 2010, Caltrans requested formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to the ESA for its proposed Program for Routine Maintenance and Repair Activities in Caltrans Districts 1, 2, and 4 (Program). In this Program, Caltrans will act as the lead Federal action agency for ESA section 7 consultation when FHWA money will be used. Where FWHA money is not used, the Corps will be the Federal Action Agency for section 7 consultation (and Caltrans will be the applicant as defined in 50 CFR 402.02). Consultation was requested due to Caltrans' determination that implementation of qualifying maintenance and repair activities throughout Caltrans Districts 1, 2, and 4, may affect,

and are likely to adversely affect, the following endangered and threatened ESA-listed species: Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) Evolutionary Significant Unit (ESU), Central California Coast (CCC) coho salmon ESU, California Coastal (CC) Chinook salmon (*O. tshawytscha*) ESU, Sacramento River Winter-run (SRWR) Chinook salmon ESU, Central Valley Spring-run (CVSR) Chinook salmon ESU, Northern California (NC) steelhead (*O. mykiss*) Distinct Population Segment (DPS), CCC steelhead DPS, California Central Valley (CV) steelhead DPS, southern DPS of North America green sturgeon (*Acipenser medirostris*), southern DPS of Pacific eulachon (*Thaleichthys pacificus*), but was not likely to adversely affect their designated critical habitats. In addition, Caltrans determined the Program may affect but is not likely to adversely affect Steller sea lion (*Eumetopias jubatus*) designated critical habitat. Finally, Caltrans determined the Program would have no effect on the following species: blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), fin whale (*B. physalus*), sei whale (*B.borealis*), sperm whale (*Physter macrocephalus*), Steller sea lion (*Eumetopias jubatus*), leatherback turtle (*Dermochelys coriacea*), olive ridley turtle (*Lepidochelys olivacea*), loggerhead turtle (*Caretta caretta*), and green turtle (*Chelonia mydas*). As a result, these species for which Caltrans determined the Program would have no effect were excluded from this consultation.

In response to the December 6, 2010, consultation request, NMFS responded with a January 12, 2011, letter initiating consultation and requested a 60-day extension. Subsequent extensions were agreed to by Caltrans and NMFS on June 15, 2011, and September 15, 2011. The December 2010 consultation request and Routine Maintenance Programmatic Biological Assessment (BA) included a wide range of proposed activities. In order to simplify and improve the efficiency of the consultation process, NMFS and Caltrans agreed to split the list of activities into two separate programmatic consultations: those requiring formal consultation and a programmatic biological opinion, and those requiring only informal consultation and a programmatic letter of concurrence.

NMFS and Caltrans staff held several meetings in 2011 and 2012, to discuss the proposed activities, their potential effects on ESA-listed species and critical habitat, minimization measures, and the development of action-specific criteria that would allow the activity to be included under either the formal or informal programmatic consultations. On August 27, 2012, NMFS issued its letter of concurrence to Caltrans for all proposed activities Caltrans determined may affect, but were not likely to adversely affect ESA-listed species and their designated critical habitats (NMFS 2012a; see Enclosure 3).

On September 27, 2012, NMFS and Caltrans agreed to modify or reduce the extent of some proposed activities and remove two activities (rock and substrate blasting and new installation of fishways and stream gradient control structures) from the proposed action. On January 16, 2013, NMFS and Caltrans agreed to a consultation completion date of approximately April 15, 2013,

which was then extended (on April 17, 2013) to June 1, 2013. NMFS, Caltrans, and Corps staff held meetings on February 25, 2013, and March 20, 2013, to discuss oversight and administration of the Program. During the February 25th meeting, Caltrans and NMFS agreed to expand the Program's action area to include all of Caltrans' District 4. In doing so, a small number of streams within the South-Central California Coast (SCCC) steelhead DPS have been added to the Program. During the April 17, 2013, meeting, NMFS and Caltrans agreed to include activities under the previously issued letter of concurrence (*e.g.*, sediment removal, vegetation clearing) under one consultation. Therefore, this biological opinion attaches and incorporates by reference the August 27, 2012, letter of concurrence and includes actions or projects that are both not likely to adversely affect ESA-listed species and likely to adversely affect ESA-listed species. Following Caltrans and NMFS agreement to include the entire Program under one consultation (April 17, 2013), the project description and administration sections of the Program were revised and draft project description and administration sections were completed by Caltrans and NMFS on July 11, 2013.

II. DESCRIPTION OF THE PROPOSED ACTION

The Program involves the maintenance, as needed, of existing Caltrans infrastructure from 2013 through 2023 within Caltrans Districts 1, 2, and 4, which includes the San Francisco Bay Region and coastal/western California north to the Oregon border (the area displayed in Figure 1). Caltrans proposes to use FHWA funds for five Covered Activities. Where FHWA money is not used, the Corps proposes to permit these Covered Activities and Caltrans will be the applicant as defined by 50 CFR 402.02. Covered Activities are as follows:

- Covered Activity-1: Slide Abatement and Repair;
- Covered Activity-2: Safety Improvement;
- Covered Activity-3: Drainage System Maintenance and Repair;
- Covered Activity-4: Bridge Repair, Retrofit, Replacement and Maintenance; and
- Covered Activity-5: Maintenance Planning.

The Program is organized in the following hierarchical structure: Covered Activities are comprised of one or more Site-Specific Projects; and Site-Specific Projects are comprised of one or more Project Actions. Covered Activities and Site-Specific Projects are described in detail in *Section II.B. Description of Covered Activities and Site-Specific Projects*. The Site-Specific Projects and Project Actions proposed for a given Covered Activity will vary with location and conditions. Depending on the circumstances, these Project Actions may be implemented alone or in combination to meet Caltrans' highway maintenance responsibilities.

The Program includes three categories: Category 1- projects that do not require notification prior to construction or completion of a post-project reporting form because of their extremely low

anticipated effects; Category 2- projects that do not require notification prior to construction but do require completion of a post-project reporting form; and Category 3- projects that require notification prior to construction and completion of a post-project reporting form. Category 1 and 2 projects (those that do not require notification prior to construction) are aligned with the group of projects included in NMFS' letter of concurrence (NMFS 2012a). In this letter of concurrence, NMFS concurred with Caltrans and the Corps' determination that these Category 1 and 2 projects are not likely to adversely affect ESA-listed species or their designated critical habitats. To further minimize the effect of the Program on ESA-listed species and designated critical habitat, NMFS and Caltrans agreed to these categories and to exclude or limit the extent of Project Actions covered under the Program. Additionally, a Program administration and oversight process was developed, in-part, to manage this notification process and compliance with Program criteria. Category 1 and 2 projects do not require Caltrans to submit a pre-project notification form, yet Category 2 projects require post-project reporting as indicated in *Section II.B. Project Categorization, Limits, and Minimization Measures*. Some Category 3 projects are likely to adversely affect listed species. Therefore, all Category 3 projects require Caltrans to submit a pre-project notification form to NMFS for review and, if implemented, post-project reporting. Reporting requirements are described in detail in *Section. II.C. Oversight and Administration*.

The Site-Specific Projects covered within this Program include the routine maintenance, repair, and replacement of existing structures and facilities, as well as preventative maintenance activities to preserve existing infrastructure. The activities covered do not include the construction of any new structures or facilities, or expansion of any existing ones. All activities will be single and complete actions; therefore, no interrelated or interdependent activities are anticipated or have been identified.

Except for cleaning and debris removal, individual projects authorized under the Program will be implemented annually between June 15 and October 15. The work window can be extended to November 15 contingent on appropriate dry weather conditions and stream flows. Extensions will be initiated on an as needed basis and as agreed upon by NMFS. Before extending the work window, Caltrans will contact NMFS and provide information regarding the purpose and need of the extension, and a proposed schedule for activities to be performed during this time. Revegetation outside of the active channel may continue beyond October 15 until November 15 if necessary, and will be contingent on weather forecasts. Limited earthmoving associated with preparation of the site for revegetation may occur within the October 16 - November 15 timeframe, but only as necessary for revegetation efforts and as agreed upon by NMFS.

A. Description of Covered Activities and Site-Specific Projects

This section of the biological opinion describes Covered Activities, Site-Specific Projects, and the number of Site-Specific Projects that could occur annually by District. Caltrans proposes to implement its standard maintenance and construction site best management practices (BMPs) and several Project Action-specific Additional Best Management Practices (ABMPs) to minimize the effects of the actions on ESA-listed species and their designated critical habitats. The Project Actions required for completion of individual projects (*i.e.,* Site-Specific Projects) and associated ABMPs are described in *Section II.A.6. Project Actions and BMPs*.

1. Covered Activity-1: Slide abatement and repair

Slide abatement and repair includes: (1) removal of slide and alluvial debris and soil from existing roadways, road shoulders, and adjacent side slopes when they pose a potential hazard to motorists; (2) stabilization of slopes to avoid or minimize debris slides and potential damage to roadways; and (3) stabilization of streambanks and channels to avoid or minimize erosion and potential damage to roadways, bridges, and culverts. These activities are typically undertaken to ensure the continued safe use of existing infrastructure managed by Caltrans.

Equipment required to complete this Covered Activity will depend upon the scale of the material that must be removed, but in general a front-end loader, bulldozer, backhoe, and dump trucks will be required, as well as pickup trucks. A vibratory pile driver may also be required to complete this Covered Activity if sheet piling is installed as temporary or permanent slope protection. A vibratory pile driver may be used in upland areas only. Equipment will generally be operated from the road prism, although in rare instances equipment may be operated outside the developed road prism to remove material and stabilize adjacent slopes. Equipment/vehicle operation is not typically required in surface waters or sensitive habitats (*e.g.,* wetlands, streams, rivers), although operation within such habitats may be unavoidable to complete an Site-Specific Project in a timely manner or to reduce impacts on riparian vegetation or other terrestrial or aquatic species, habitats, or resources. However, if any life stage of any listed species may be present during in-water activities or substantial disturbance, then capture, handling, exclusion, salvage, and relocation will be implemented for the listed species (ABMP-14.5, described *Section II.A.6. Project Actions and BMPs*).

The following Site-Specific Projects can occur as part of this Covered Activity.

a. Site-Specific Project-1.1: Removal of slide and alluvial debris and soil from roadways, road shoulders, and side slopes

Sediment and debris may be deposited on or around roadways by side slope failure and high streamflow. Caltrans removes these materials from the roadways to maintain road function,

provide motorist safety, protect water quality, ensure drainage, and protect infrastructure. Materials outside the roadway or ditch slopes that are unstable and constitute potential slides, materials from slides that have come into the roadway or ditch, and materials that have slipped out of new or old embankments are excavated and removed to Caltrans gravel pits and approved waste material repositories. Where needed, soils from the failing road shoulders/slopes below highway and ditch slopes are removed to reestablish the structural integrity of these areas. During this process, sediment may also be tracked onto the roadways by movement of construction and hauling equipment and must be removed.

The area affected by this Site-Specific Project will vary depending upon the scale of the material that is present on the roadway and that must be removed. The area affected will generally include the managed road prism/right-of-way but could include surface waters or wetlands in some instances.

Table 1: Annual frequency (number of projects) of Site-Specific Project-1.1 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
1.1: Removal of slide and alluvial debris and soil from roadways, road shoulders, and side slopes	35	10	40

b. Site-Specific Project-1.2: Stabilization of side slopes and removal of debris on or near roads to minimize debris slides and damage to roads

The purpose of stabilizing side slopes (*e.g.*, natural and fill slopes, cutbanks) is to minimize erosion and slope failure that could damage roads and other infrastructure, and to stabilize or support the roadway. Replacement and installation of new rock slope protection (RSP) and other stabilizing measures on hill slopes reduces future maintenance and repair activities that could be required to repair and replace lost infrastructure, and that could adversely affect listed species and habitat.

The area affected by this Site-Specific Project will vary depending upon the scale of the side slopes that must be stabilized. The area affected will include upland slopes adjacent to managed road prism/right-of way.

Table 2: Annual frequency of Site-Specific Project-1.2 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
1.2: Stabilization of side slopes to minimize erosion and damage to adjacent roads, bridges, and culverts	30	10	20

c. Site-Specific Project-1.3: Stabilization of stream banks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts

The purpose of stabilizing streambanks and channels is to minimize erosion and streambank failure that could damage roads, bridges, culverts, and other infrastructure. Stabilizing streambanks reduces potential subsequent repair activities that could be required to repair and replace lost infrastructure, and that could adversely affect listed species and habitat.

The area affected by this Site-Specific Project will vary depending upon the extent of the streambank or channel that is located adjacent to a road, bridge or culvert. However, the length of streambank or channel affected is not expected to exceed 500 linear feet. The area affected will be dependent upon the size of the stream and the Project Actions required to complete this Site-Specific Project. It is difficult to determine the square footage of the affected area at the programmatic level due to the variety of streams and rivers that could be affected, which could range from 5 to 50 feet in width (*e.g.*, maximum area expected to be affected could range from 2,500 square feet to 25,000 square feet). As with all projects in the Program, repairs will be associated with existing facilities or installations.

Table 3: Annual frequency of Site-Specific Project-1.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
1.3: Stabilization of streambanks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts	30	10	20

2. <u>Covered Activity-2: Safety Improvement</u>

Safety improvements include activities intended to prolong the life of a roadway, provide safety to motorists, and provide information to motorists (*e.g.*, speed limits, upcoming exits and interchanges, hazards).

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, hauling trucks, backhoe, trencher, drilling rigs/augers, paver, rollers, concrete saw, jackhammer, and other handheld power tools. Equipment/vehicle operation will not be required in surface waters or wetlands. No drilling lubricants will be required to complete this Covered Activity; activities that require drilling lubricants are described below under Covered Activity-5. Augers are relatively small and do not require the use of lubricants for this Covered Activity.

The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

a. Site-Specific Project-2.1: Maintenance, Repair, and Replacement of Asphalt, Concrete, and Other Construction Materials on Roads and Other Infrastructure

Road and bridge surfaces degrade over time in response to the initial design of the pavement, traffic volumes and loads, cumulative traffic volume (especially truck traffic), and environmental factors such as moisture infiltration and heat and cold cycles. Repair and replacement of road surfaces is necessary to maintain the function and safety of roads and bridges.

Paving projects involve patching, repairing, and replacing roadway surfaces and pavements. Caltrans maintains several thousand miles of paved highway in those portions of Districts 1, 2, and 4 within the Program coverage area. Each section of highway paved with asphalt or concrete must be repaved every 10 to 14 years. If the existing pavement is in good condition, it may be covered over with a new layer of asphalt. Repair of badly deteriorated pavement could require grinding of existing pavement or replacement of the road foundation material prior to repaving. This typically involves grinding off and replacing the existing asphalt pavement.

Rehabilitation of small damaged pavement areas often requires "chipsealing"—the addition of hot tar and a layer of small rocks placed on the existing asphalt or concrete paving. This process involves the use of an asphalt plant area where hot liquid asphalt oil is mixed with crushed rock to produce the new asphalt. A rock crusher is also often required at or near the site. When the project is very large or very far from a commercial plant, a portable asphalt plant may be set up in a gravel pit or other staging area near the site.

Table 4: Annual frequency of Site-Specific Project-2.1 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
2.1: Maintenance, repair, and replacement of asphalt, concrete, and other construction materials on roads and other infrastructure	60	30	80

b. Site-Specific Project-2.2: Installation and Replacement of Signs

Signs are needed for road safety and motorist information. Signs are installed when existing signs deteriorate or are destroyed, and when previously unrecognized safety concerns become apparent. Routine road maintenance and other covered construction activities may also require the replacement and installation of road and highway signs. Installation of very large signs, including concrete footings and steel supports, potentially disturbs substantial areas. Trenching may be required to run utilities from existing sources to lighted signs.

The area affected by this Site Specific Project will vary depending upon the scale of the signage to be installed or replaced, but in general the area will not exceed 200 square feet. The area affected will be confined to the existing road prism/right-of-way. This Site-Specific Project will not include operation of equipment or work beyond the existing right-of-way, particularly work within sensitive habitats such as surface waters or wetlands.

Table 5: Annual frequency of Site-Specific Project-2.2 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
2.2: Installation and replacement of signs	200	50	200

c. Site-Specific Project-2.3: Installation and Replacement of Guardrails

Guardrails are needed for road safety and to protect infrastructure, property, and other features adjacent to the roadway. Railings and barriers are used to reduce the potential severity of accidents resulting from vehicles leaving the road, prevent out-of-control vehicles from crossing the median, and decelerate errant vehicles.

The area affected by this Site-Specific Project will vary depending upon the scale of the guardrail to be installed or replaced. The area affected will be confined to include only the existing road prism/right-of way. This Site-Specific Project will not include operation of equipment or work beyond the existing right-of-way, particularly work within sensitive habitats such as surface waters or wetlands.

Table 6: Annual frequency of Site-Specific Project-2.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
2.3: Installation and replacement of guardrails	30	30	30

3. <u>Covered Activity-3: Drainage system maintenance and repair</u>

Drainage system maintenance and repair includes maintenance and repair to channels, ditches, culverts, and bridges to ensure conveyance of surface waters, ensure fish passage, and avoid erosion of infrastructure, adjacent features, and private property.

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, cranes, backhoes, hauling trucks, vibratory pile-driving rigs, graders, trenchers, augers, pavement grinders, pavers, rollers, jack-hammers, vacuum trucks, and hand-held tools such as shovels and rakes. The equipment generally operates from the road prism, although in rare instances equipment may be required to operate outside of the developed road prism. Equipment/vehicle operation is not typically required in surface waters or sensitive habitats (*e.g.*, wetlands), although at times operation within such habitats may be required to complete a Site-Specific

Project in a manner that may reduce impacts on riparian vegetation or other terrestrial species, habitats, or resources. However, if any life stage of any listed species may be present during in-water activities or substantial disturbance, then capture, handling, exclusion, salvage, and relocation will be implemented for the listed species (ABMP-14.5, described *Section II.A.6. Project Actions and BMPs*). All proposed rehabilitation, repair, or replacement activities in channels, ditches, or culverts that are barriers or significant impediments to anadromous fish passage must also include improvement of fish passage in order to be covered under the Program.

The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

a. Site-Specific Project-3.1: Cleaning of drainage channels and ditches to maintain function and avoid damage to adjacent roads

Drainage channels, ditches, and associated components are generally man-made features that on occasion could contain fish. These facilities are cleaned periodically to permit free flow and to avoid erosion and damage to roads and other infrastructure. Excavation of debris and sediment from ditches, channels, and detention or retention basins requires minor grading along ditches and at storm drain outfalls and inlets. Ditches and channels often require cleaning or grading when standing water is on the road shoulder or if deposits fill more than 50 percent of the capacity of the retention/detention basin. Retention or detention basins require periodic maintenance to preserve the line, grade, depth, and cross section to which they were originally designed.

Debris and accumulated sediment is removed by manual cleaning methods or by using a backhoe or a vacuum truck. Solids are stored on Caltrans property, tested, and disposed of at an approved disposal facility or recycled as fill material if suitable. In some cases, especially larger streams or streams where it is beneficial to retain stream sediments and woody debris in the channel, some or all of the material is deposited in the channel but downstream of the culvert or bridge. Liquids may be decanted at an approved decanting facility where Caltrans use is approved.

The length of drainage channel or ditch affected by this Site-Specific Project will vary depending upon the scale of the feature to be cleaned. However, the length is not expected to exceed 500 linear feet. The extent of the area affected will be dependent upon the size of the drainage channel or ditch and the Project Actions required to complete this Site-Specific Project. It is difficult to determine the square footage of the affected area of drainage channels and ditches at the programmatic level due to the variety of these features that could be affected, which could range from 1 feet to 10 feet in width (*e.g.*, maximum area expected to be affected could range from 500 square feet to 5,000 square feet).

Table 7: Annual frequency of Site-Specific Project-3.1 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
3.1: Clearing of drainage channels and ditches to maintain function and avoid damage to adjacent roads	Total	15	10	40
	Fish Bearing Streams	3	2	8

b. Site-Specific Project-3.2: Cleaning of sediment and debris from culverts, bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions

Culverts, box culverts, bridge piers, abutments, and supports, and areas of the stream channel immediately adjacent to these types of infrastructure are cleaned of sediment and debris to provide sufficient depth and grade to ensure designed streamflow under the roadway and in the affected stream channel. Debris and drift is also removed from bridge piers, bearing seats, and abutments**.**

The vast majority of these projects will involve low-impact activities (*i.e.*, removal of sticks, leaves, or 3-4 shovelfuls of sediment). The length of stream channels affected by this Site-Specific Project will vary depending upon the scale of the sediment and debris to be cleaned and removed, but is not expected to exceed 50 linear feet. However, the area affected is difficult to estimate due to the variance in widths of channels where this Site-Specific Project may be implemented, which could range from 1 to 100 feet in width (*e.g.*, maximum area expected to be affected could range from 50 square feet to 5,000 square feet). The extent of the area affected will be dependent upon the size of the stream and the Project Actions required to complete this Site-Specific Project.

This Site-Specific Project is typically (approximately 90 percent of the time) applied to the cleaning of sediment and debris from culverts. Most of these culverts are located on non-fish-bearing streams. However, these features may discharge to fish-bearing waters, and activities within these features could affect fish-bearing waters.

Table 8: Annual frequency of Site-Specific Project-3.2 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts and bridges and to maintain streamflow conditions	Total	8,000*	350*	9,000*

***** According to Caltrans (2010), the vast majority of the estimated annual frequency of this Site-Specific Project involves low-impact activities. Most of the cleaning involves removal of sticks and leaves from culvert inlets and removal of very small amounts of sediment (3–4 shovels full on average). Most of this type of work is done by hand, usually after the first couple of storms each year.

c. Site-Specific Project-3.3: Rehabilitation of culverts to maintain function; and

d. Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where applicable, improve flow conditions to support fish passage and/or sediment transport

Culverts can be damaged by storm events, debris, and cleaning activities. Damage that impairs function or that may result in erosion and damage to the roadway could require replacement, repair, or a retrofit. Culverts may also be replaced, repaired, or retrofitted to accommodate unforeseen flow, sediment, and debris conditions. All culverts replaced in the Program will maintain, improve, or provide fish passage and will ensure that Caltrans-managed infrastructure continues to function in a safe and efficient manner. Culvert repairs and rehabilitation will include repairs to damaged culverts to maintain or improve fish passage through the culverts and to ensure infrastructure function. Culverts may also be retrofitted with baffles, weirs, fishways, and appurtenant grade control structures such as rock, wood, or concrete weirs to provide or improve fish passage.

The length of channel affected by these Site-Specific Projects will vary depending upon the scale of the culvert replacement, repair, or retrofit, and Project Actions required to complete Site-Specific Projects. However, this Site-Specific Project is not expected to affect more than 400 linear feet of channel. It is difficult to determine the square footage of the affected area at the programmatic level due to the variety of channels that could be affected, which could range from 1 to 10 feet in width (*e.g.*, maximum area expected to be affected could range from 400 to 4,000 square feet).

Table 9: Annual frequency in fish bearing streams of Site-Specific Project-3.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
3.3: Rehabilitation of culverts to maintain Function	30	30	30

Table 10: Annual frequency of Site-Specific Project-3.4 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
3.4: Replacement, repair and retrofitting of culverts to maintain function and, where applicable, improve flow conditions to support fish passage and sediment transport	Total	150	80	60
	Fish Bearing Streams	30	30	30

4. <u>Covered Activity-4: Bridge repair, retrofit, replacement, and maintenance</u>

Bridge repair, retrofit, replacement, and maintenance are implemented to prolong the use and function of bridges, ensure motorist safety, and protect the environment. Whether a bridge is repaired, rehabilitated, or replaced depends on the age of a bridge and damage that may occur to a bridge (*e.g.*, from a storm event, earthquake, or vehicle or boat collision).

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, pavement removal equipment, vibratory pile-driving rigs, pavers, rollers, grinders, jackhammers, welding machines, augers, hauling trucks, and hand-held power tools. The equipment operates from the road prism, although in rare instances equipment may be required to operate outside of the developed road prism to repair bridge abutments or supports. With the exception of instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, construction equipment and vehicles will not operate in anadromous waters[1] unless the channel is dewatered or otherwise dry. In rare instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, relocation and exclusion of listed fish from the area will be implemented prior to operating in the wetted channel. All proposed rehabilitation, repair, or replacement activities at bridges that are barriers or significant impediments to anadromous fish passage must also include improvement of fish passage in order to be covered under the Program.

The length of stream affected by this Covered Activity will vary depending upon the scale of the bridge project and the required Project Actions. However, the length affected is not expected to

[1] Anadromous waters are waters where anadromous fish are known to occur. These waters may or may not include anadromous fish critical habitat.

be greater than 400 linear feet of channel. It is difficult to determine the square footage of the affected area at the programmatic level due to the variety of channels that could be affected, which could range from 10 to 50 feet in width (*e.g.*, maximum area expected to be affected could range from 4,000 to 20,000 square feet).

The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

a. Site-Specific Project-4.1: Repair of bridges to maintain function

Bridge maintenance generally includes work such as repairing damage or deterioration in various bridge components; cleaning out drains; repairing expansion joints; cleaning and repairing structural steel; sealing concrete surfaces; and sanding and painting. Bridge maintenance includes work initiated by Caltrans districts and work recommended in bridge inspection reports. Work initiated by the District is generally in response to a problem on a bridge that would affect public safety or the integrity of the structure if not promptly addressed.

Table 11: Annual frequency of Site-Specific Project-4.1 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
4.1: Repair of bridges to maintain function	Total	50	30	60
	Fish Bearing Streams	10	5	10

b. Site-Specific Project-4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (e.g., earthquake standards)

Aging, storm events, debris, cleaning activities, earthquakes, and collisions by vehicles and boats may damage small bridges. Damage to an extent that impairs safety and function could require rehabilitation. In addition, current standards and specifications may require that bridges be retrofitted. Rehabilitation could include reinforcement of the bridge structure and placement of additional piers and footings.

Table 12: Annual frequency in fish bearing streams of Site-Specific Project-4.2 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (*e.g.*, earthquake standards)	10	5	10

c. Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where applicable, improve flow conditions for fish passage and sediment transport

Aging, storm events, debris, cleaning activities, earthquakes, and collisions by vehicles and boats may damage small bridges. Damage to an extent that impairs safety and function could require bridge replacement. In addition, current standards and specifications may require bridge removal and replacement. Bridges may also be replaced to accommodate unforeseen flow, sediment, and debris conditions. Replacement bridge designs in the Program will improve flow conditions to support fish passage and sediment transport. Additionally, this Site-Specific Project will cover the replacement of culverts with small bridges. Culverts that must be replaced may be replaced with small bridges when financially and technically feasible.

Table 13: Annual frequency in fish bearing streams of Site-Specific Project-4.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications and, where applicable, improve flow conditions for fish passage and sediment transport	5	5	5

5. <u>Covered Activity-5: Project planning (geotechnical investigations)</u>

The strength and longevity of bridges, culverts, and other infrastructure ultimately depends on their foundations. Maintenance planning typically involves geotechnical investigations to inform early planning for future activities related to culverts, bridges, and slope stabilization. The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, backhoes, bulldozers, hauling trucks, augers, vibratory pile-driving rigs, drilling rigs, and hand-held power tools. The equipment operates from the road prism, although in rare instances equipment may be required to operate outside of the developed road prism to complete a geotechnical boring in an appropriate area for completion of adequate planning or engineering

efforts. Equipment/vehicle operation rarely occurs in surface waters or sensitive habitats (*e.g.*, wetlands), although operation within such habitats may be unavoidable. With the exception of instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, construction equipment and vehicles will not operate in anadromous waters unless the channel is dewatered or otherwise dry. In rare instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, relocation and exclusion of listed fish from the area will be implemented prior to operating in the wetted channel.

The length of channel affected by this Covered Activity will vary depending upon factors such as ease of site access, test hole location, and number of test holes. However, the length of channel affected will not exceed a total of 30 linear feet of channel in a given project. The intent of the 30 linear foot channel limitation is to provide adequate space to construct a gravel work pad in water that is approximately three feet in depth. It is difficult to determine the square footage of the affected area at the programmatic level due to the different channel access approaches (*i.e.*, bridge deck, barge, temporary work pad, *etc.*) and channels size, which could range from 1 to 50 feet in width (*e.g.*, maximum area expected to be affected could range from 30 to 1,500 square feet). This work will not occur during those times of the year when redds could be present in the work area.

a. Site Specific Project-5.1: Drilling of geotechnical test holes to facilitate the early planning process for future culvert replacement, bridge rehabilitation and replacement, and side slope stabilization projects

The strength and longevity of bridges, culverts, and other infrastructure ultimately depends on their foundations. Part of the design process associated with new structures or retrofitting is to conduct a foundation investigation. In these investigations, geotechnical test holes are drilled to collect subsurface information. This includes depth-to-parent material (rock), rock type and quality, soil type and strength, and groundwater levels. This information is then used to develop a soil/rock profile used to recommend a foundation and design for the project.

Table 14: Annual frequency of Site-Specific Project-5.1 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
5.1: Drilling of geotechnical test holes to facilitate the early planning process for future culvert replacement, bridge rehabilitation and replacement, and side slope stabilization projects	120	80	220

6. Project Actions and BMPs

Each Site-Specific Project involves the implementation of one or more Project Actions to repair and maintain transportation infrastructure (Table 15). The number and type of Project Actions required for each Site-Specific Project will be determined by the resident engineer during project design. Caltrans will be required to clearly identify which Project Actions they will implement/or have implemented to complete each Site-Specific Project.

Table 15: Site-Specific Projects and associated Project Actions

Site-Specific Project	Project Actions
1.1: Removal of slide and alluvial debris and soil from roadways, road shoulders, and side slopes	1, 2, 3, 4, 5, 10, 11, 13, 15, 20, and 29
1.2: Stabilization of side slopes	1, 2, 3, 4, 5, 10, 11, 13, 15, 20, and 29
1.3: Stabilization of streambanks and channels	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 28, 29, and 30
2.1: Maintenance, repair, and replacement of asphalt, concrete, and other construction materials	1, 2, 3, 4, 5, 6, 9, and 29
2.2: Installation and replacement of signs	1, 2, 3, 4, 5, 6, 8, 10, and 29
2.3: Installation and replacement of guardrails	1, 2, 3, 4, 5, 6, 8, 10, and 29
3.1: Clearing of drainage channels and ditches	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 28, 29, and 30
3.2: Cleaning of sediment and debris from culverts, bridge abutments and supports	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 28, 29, and 30
3.3: Rehabilitation of culverts	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 28, 29, and 30
3.4: Rehabilitation of culverts	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 28, 29, and 30
4.1: Replacement, repair and retrofitting of culverts	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 28, 29, and 30
4.2: Repair of bridges	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 28, 29, and 30
4.3: Replacement of small bridges	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, and 30
5.1: Drilling of geotechnical test holes	1, 2, 3, 4, 5, 8, 10, 11, 13, 14, 29, and 30

Caltrans and NMFS agreed to exclude two Project Actions from the Program: Project Action-24: Install fishways or stream gradient control structures; and Project Action-27: Blast rock and other substrates. For the remaining Project Actions, various types of BMPs will be implemented to avoid or minimize impacts on fish and wildlife species and their associated habitat covered

under the Program. BMPs include Caltrans' standard maintenance and construction site BMPs, as well as Additional BMPs, or ABMPs, developed specifically for Project Actions in the Program. The standard BMPs have been developed by Caltrans under the Statewide Stormwater Management Plan (SWMP) and National Pollutant Discharge Elimination System (NPDES) permit (Caltrans 1999). A complete list, description, and implementation criteria for each standard maintenance BMP are provided in Appendix C of Caltrans (2010).

Project Actions and associated ABMPs are briefly described at first introduction below. The ABMP list is comprehensive and represents options available to the action agency to minimize effects; various ABMPs will be prescribed depending on site conditions and time of year.

a. Project Action-1: Operate construction equipment and vehicles

- ABMP-1.1: Equipment will be operated during the least sensitive diurnal, seasonal, and meteorological periods relative to the potential effects on listed species and habitat if feasible.
- ABMP-1.2: Equipment will not operate in sensitive areas or habitats, such as wetlands and surface waters (Note: if equipment is necessary in waters or wetlands, see Project Action-14).
- ABMP-1.3: Equipment will be inspected on a daily basis for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials prior to operating equipment.
- ABMP-1.4: A Spill Prevention, Control, and Countermeasures (SPCC) Plan will be developed for each project that requires the operation of construction equipment and vehicles. The SPCC Plan will be kept on-site during construction and the appropriate materials and equipment will also be on-site during construction to ensure the SPCC Plan can be implemented. Personnel will be knowledgeable in the use and deployment of the materials and equipment so response to an accidental spill will be timely.

b. Project Action -2: Use of temporary lighting for night construction activities

- ABMP-2.1: Maintenance and construction activities will be avoided at night to the extent practicable.
- ABMP-2.2: When night work cannot be avoided, disturbance of listed species will be avoided and minimized by restricting substantial use of temporary lighting to the least sensitive seasonal and meteorological windows.
- ABMP-2.3: Lights on work areas will be shielded and focused to minimize lighting of listed-species habitat.

c. Project Action -3: Maintain and fuel construction equipment and vehicles

- ABMP-1.2; 1.3; 1.4; and
- ABMP-3.1: Maintenance and fueling of construction equipment and vehicles will occur at least 15 meters from the Ordinary High Water Line (OHWL) or the edge of sensitive habitats (*e.g.*, wetlands).

d. Project Action -4: Clean the roadway of sediment and debris from landslide, flood events, and construction

- ABMP-5.1: Sediment and debris removed from the roadway will be disposed of off-site, at an approved location, where it cannot enter surface waters.

e. Project Action-5: Temporarily or permanently store sediment and debris, and pavement, petroleum products, concrete, and other construction materials

- ABMP-1.4; 5.1.

f. Project Action-6: Apply pavement, petroleum products, concrete, and other construction materials to surface of roads, bridges, and related infrastructure

- ABMP-1.4; and
- ABMP-6.1: Falsework will be installed to keep bridge debris and construction, maintenance, and repair materials from falling into streams during demolition, construction, and substantial maintenance and repair activities.

g. Project Action-7: Treat and discharge water conveyed from the construction area

- ABMP-7.1: Water pumped from areas isolated from surface water to allow construction to occur in the dry will be discharged to an upland area providing overland flow and infiltration before returning to stream. Upland areas may include sediment basins of sufficient size to allow infiltration rather than overflow or adjacent dry gravel/sand bars if the water is clean and no visible plume of sediment is created downstream of the discharge. Other measures may be used such as a baker tank or methods described in BMP NS-2.
- ABMP-7.2: A NMFS approved fish biologist will be on site to observe de-watering activities and to capture/rescue any fish that are observed in an isolated area during de-watering activities.

h. Project Action-8: Use drill rigs and drilling lubricants

- ABMP-1.4; and
- ABMP-8.1: Drilling will be conducted outside of the stream channel or only in dry stream beds, to the extent practicable. If water is present, see ABMP-8.4.
- ABMP-8.2: When geotechnical drilling takes place within the stream channel, including gravel beds and bars, drilling mud will be bentonite without additives; initial drilling through gravel will be accomplished using clean water as a lubricant; after contact with bedrock or consolidated material, drilling mud (*i.e.*, bentonite clay) may be used.
- ABMP-8.3: All drilling fluids and materials will be self-contained and removed from the site after use; drilling will be conducted inside a casing so that all spoils are recoverable in a collection structure.
- ABMP-8.4: If drilling must occur where water is present, the work area will be isolated or the flow will be diverted around the work area.

i. Project Action-9: Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure

- ABMP-1.4; 6.1.

j. Project Action-10: Remove and disturb upland, riparian, and wetland vegetation

- ABMP-1.4; and
- ABMP-10.1: Trees as identified in any special contract provisions or as directed by the Project Engineer will be preserved.
- ABMP-10.2: Hazard trees greater than 24-inches diameter at breast height (DBH) will be removed only by direction of the Project Engineer.
- ABMP-10.3: Trees will be felled in such a manner as not to injure standing trees and other plants to the extent practicable.
- ABMP-10.4: Environmentally Sensitive Areas will be fenced to prevent encroachment of equipment and personnel into wetlands, riparian areas, stream channels and banks, and other sensitive habitats.
- ABMP-10.5: Vegetation will be mowed to a height greater than 4 inches.
- ABMP-10.6: Soil compaction will be minimized by using equipment that can reach over sensitive areas and that minimizes the pressure exerted on the ground.
- ABMP-10.7: Where soil compaction is unintended, compacted soils will be loosened after heavy construction activities are complete.
- ABMP-10.8: Where vegetation removal is temporary to support construction activities, native species will be re-established that are specific to the project location and that comprise a diverse community of woody and herbaceous plants.

k. Project Action-11: Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment

- ABMP-1.4; 10.4; 10.7; 10.8; and

- ABMP-11.1: Storage areas will disturb less than 2.5 acres of vegetated or currently undisturbed area.
- ABMP-11.2: Storage areas will not disturb wetlands or other special status plant communities.
- ABMP-11.3: For permanent storage areas that have been filled to capacity with sediment and debris, the final configuration will conform to natural contours (elevations, profile, and gradient) of surrounding terrain and native plant species will be established that are specific to the project location and comprise a diverse community of woody and herbaceous plants.
- ABMP-11.4: Construction staging and storage areas will be located a minimum of 150 feet from the OHWL and other sensitive habitats (*e.g.*, wetlands).

l. Project Action-12: Construct temporary sediment-settling basins

- ABMP-10.4; 10.7; 10.8; and
- ABMP-12.1: Temporary sediment basins will be cleaned of sediment and the site restored to pre-construction contours (elevations, profile, and gradient) and function post-construction.

m. Project Action-13: Grade temporary access roads, traffic detours, and staging and work areas

- ABMP-10.4; 10.7; 10.8; and
- ABMP-13.1: Temporary access and detours will be located a minimum of 50 feet from the OHWL and other sensitive habitats (*i.e.* wetlands).

n. Project Action-14: Operate construction equipment and vehicles in the stream channel

- ABMP-14.1; 14.5; and 14.8: With the exception of instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, construction equipment and vehicles will not operate in anadromous waters unless the channel is dewatered or otherwise dry. In rare instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, relocation and exclusion of listed fish from the area will be implemented prior to operating in the wetted channel.
- ABMP-14.2: Existing roadways and stream crossings will be used for temporary access roads whenever reasonable and safe.
- ABMP-14.3: The number of access and egress points and total area affected by vehicle operation will be minimized; disturbed areas will be located to reduce damage to existing native aquatic vegetation, substantial large woody debris, and spawning gravel.
- ABMP-14.4: Cleaning of culverts and bridge abutments and piers, and placement of RSP and other bank protection will be from the top of the bank or bridge.
- ABMP-14.6: Except for streams identified by NMFS, USFWS, and CDFW as not supporting spawning habitat, all in-water activities will be conducted outside the

spawning and incubation season for listed fish species, where such species occur, or to periods identified in cooperation with NMFS, USFWS, and CDFW to accommodate site-specific conditions.

- ABMP-14.7: Modified or disturbed portions of streams, banks, and riparian areas will be restored as nearly as possible to natural and stable contours (elevations, profile, and gradient).

o. Project Action-15: Construct temporary stream crossings

- ABMP-10.4; 10.8; 14.1; 14.2; 14.3; 14.5; 14.6; 14.7; and
- ABMP-15.1: Stream width, depth, velocity, and slope that provide upstream and downstream passage of adult and juvenile fish will be preserved according to current NMFS and CDFW guidelines and criteria or as developed in cooperation with NMFS and CDFW to accommodate site-specific conditions.
- ABMP-15.2: Temporary fills, cofferdams, and diversion cofferdams that are left in stream channels will be composed of washed, rounded, spawning-sized gravel between 0.4 to 4 inches in diameter; gravel in contact with flowing water will be left in place, modified (*i.e.*, manually spread out using had tools if necessary) to ensure adequate fish passage for all life stages, and then allowed to disperse naturally by high winter flows; materials placed above the ordinary high water mark must be clean washed rock or contained to prevent material conveyance to the stream or mixing with clean gravel.

p. Project Action-16: Remove and disturb aquatic vegetation, stream sediment, and large woody debris (LWD)

- ABMP-10.4; 14.1; 14.5; 14.6; 14.7; 15.2; and
- ABMP-16.1: Disturbance and removal of aquatic vegetation will be minimized.
- ABMP-16.2: The limits of disturbance will be identified; native vegetation, stream channel substrate, and large woody debris disturbed outside these limits should be replaced if damaged.
- ABMP-16.3: The minimum amount of wood, sediment and gravel, and other natural debris will be removed using hand tools, where feasible, only as necessary to maintain and protect culvert and bridge function, ensure suitable fish passage conditions, and minimize disturbance of the streambed .
- ABMP-16.4: LWD subject to damage or removal will be retained and replaced on site after project completion as long as such action would not jeopardize infrastructure or private property or create a liability for Caltrans. LWD not replaced on-site will be stored or offered to other entities for use in other mitigation/restoration projects where feasible.
- ABMP-16.5: Disturbed areas will be minimized by locating temporary work areas to avoid patches of native aquatic vegetation, substantial LWD, and spawning gravel.
- ABMP-16.6: Where vegetation removal is temporary to support construction activities, native species will be re-established that are specific to the project location and that comprise a diverse community of aquatic plants.

- ABMP-16.7: Where spawning gravel is removed temporarily to facilitate construction, it will be stored adjacent to the site then placed back in the channel post-construction at approximately pre-project depth and gradient.
- ABMP-16.8: Excavated material will not be stored or stockpiled in the channel. Any excavated material that will not be placed back in the channel or on the bank after construction will be end-hauled to an approved disposal site.
- ABMP-16.9: Gravel and LWD excavated from the channel that is temporarily stockpiled for reuse in the channel will be stored in a manner that prevents mixing with stream flows.

q. Project Action-17: Install temporary cofferdams and diversion cofferdams

- ABMP-10.4; 14.5; 14.6; 14.7; 15.1; 15.2; and
- ABMP-17.1: Cofferdams and diversion cofferdams will affect no more of the stream channel than is necessary to support completion of the maintenance or construction activity.
- ABMP-17.2: Immediately upon completion of in-channel work, temporary fills, cofferdams, diversion cofferdams, and other in-channel structures that will not remain in the stream, *i.e.*, clean, spawning-sized gravel, will be removed in a manner that minimizes disturbance to downstream flows and water quality.
- ABMP-17.3: All structures and imported materials placed in the stream channel or on the banks during construction that are not designed to withstand high flows will be removed before such flows occur.

r. Project Action-18: Temporarily redirect stream flow

- ABMP-7.2; 10.4; 14.5; 14.6; 14.7; 15.1; and
- ABMP-18.1: The extent of stream channel dewatering will be limited to the minimum necessary to support construction activities. Monitoring of the stream diversion will occur periodically each day such devices are in operation to ensure proper function.
- ABMP-18.2: Construction of a temporary channel will proceed from the downstream to the upstream end of the channel.
- ABMP-18.3: Flow will not be diverted from the stream channel until the temporary channel is complete and all applicable soil stabilization/control measures are in place.
- ABMP-18.4: Flow will be diverted the minimum distance necessary to isolate the construction area.
- ABMP-18.5: Water will be released or pumped downstream at an appropriate rate to maintain downstream flows at all times and the outlet of all diversions shall be positioned such that the discharge of water does not result in bank erosion or channel scour and maintains pre-project hydraulic conditions.
- ABMP-18.6: For diversion from streams, rivers, and other water bodies, any water intake structure will be installed, operated, and maintained in accordance with current NMFS, USFWS, and CDFW criteria or as developed in cooperation with NMFS, USFWS, and CDFW to accommodate site-specific conditions.

s. Project Action-19: Temporarily draft water from streams and other water bodies

- ABMP-14.5; 18.6

t. Project Action-20: Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls

- ABMP-20.1: Extension of existing areas of stream bank RSP or other bank protection (*e.g.*, sheet piles) will be avoided and the extent of bank and channel armoring will be limited to the minimum necessary to protect essential infrastructure.
- ABMP-20.2: Threatened infrastructure will be relocated to maintain or reestablish natural stream sediment processes to the extent feasible.
- ABMP-20.3: Bank stabilization will incorporate bioengineering solutions consistent with site-specific engineering requirements.
- ABMP-20.4: Where RSP is necessary, native riparian vegetation and/or LWD in RSP will be incorporated.
- ABMP-20.5: The embankment toe will not extend farther into the active channel than the existing embankment.
- ABMP-20.6: RSP, sheet piles, and other erosion control materials will be pre-washed to remove sediment and/or contaminants.
- ABMP-20.7: Temporary material storage piles (*e.g.*, RSP) will not be placed in the 100 year floodplain during the rainy season (October 15 through May 31), unless material can be relocated within (*i.e.*, before) 12 hours of the onset of a storm.

u. Project Action-21: Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications

- ABMP-1.4; and
- ABMP-21.1: When concrete is poured to construct bridge footings or other infrastructure in the vicinity of flowing water, work must be conducted to prevent contact of wet concrete with water (*e.g.*, within a cofferdam). Concrete or concrete slurry will not come into direct contact with flowing water.

v. Project Action-22: Remove culverts

- ABMP-10.4; 14.1; 14.5; 14.6; 15.1.

w. Project Action-23: Clean, retrofit, or install culverts

- ABMP-10.4; 14.1; 14.5; 14.6; 14.7; 15.1; 17.2; 17.3; 20.1; 20.3; 20.4; 20.6; 20.7; and
- ABMP-23.1: Stream flow through new and replacement culverts, bridges, and over existing stream gradient control structures must meet the velocity depth, and other

passage criteria for salmonid streams as described by the current NMFS and CDFW guidelines or as developed in cooperation with NMFS and CDFW to accommodate site-specific conditions.

- ABMP-23.2: Culverts may be replaced with small bridges.
- ABMP-23.3: Scour holes at the base of bridge piers or abutments and culvert inlets and outlets will be repaired by placing no more riprap (RSP) than is necessary to mitigate the scour.

x. Project Action-25: Remove existing bridge structure, including footings, piers, and piles

- ABMP-6.1; 10.4; 14.1; 14.5; 14.6; 15.1.

y. Project Action-26: Install bridge structures, excluding impact pile-driving

- ABMP-6.1; 10.4; 14.1; 14.5; 14.6; 14.7; 15.1; 17.2; 17.3; 20.1; 20.3; 20.4; 20.6; 20.7; 23.1; 23.3.

z. Project Action-28: Capture, handle, exclude, salvage, and relocate listed species

- ABMP-28.1: If individuals of listed species may be present and subject to potential injury or mortality from construction activities, a qualified biologist will conduct a preconstruction visual survey (*i.e.*, bank observations).
- ABMP-28.2: Caltrans shall retain a qualified biologist with expertise in the areas of anadromous salmonid biology, including handling, collecting, and relocating salmonids, salmonid/habitat relationships and biological monitoring of salmonids. Caltrans shall ensure that all biologists working on a Site-Specific Project will be qualified to conduct fish collections in a manner which minimizes all potential risks to listed salmonids.
- ABMP-28.3: When listed species are present and it is determined that they could be injured or killed by construction activities, a qualified project biologist will identify appropriate methods for capture, handling, exclusion, and relocation of individuals that could be affected.
- ABMP-28.4: Where listed species cannot be captured, handled, excluded, or relocated (*e.g.*, salmonid redd), actions that could injure or kill individual organisms will be avoided or delayed until the species leaves the affected area or the organism reaches a stage that can be captured, handled, excluded, or relocated.
- ABMP-28.5: The project biologist will conduct, monitor, and supervise all capture, handling, exclusion, and relocation activities; ensure that sufficient personnel are available for safe and efficient collection of listed species; and ensure that proper training of personnel has been conducted in identification and safe capture and handling of listed species.
- ABMP-28.6: Electrofishing may be utilized when other standard fish capture methods are likely to be ineffective or other methods fail to remove all fish from the site; the project biologist must have appropriate training and experience in electrofishing techniques and all electrofishing must be conducted according to the *NMFS Guidelines for Electrofishing*

Waters Containing Salmonids Listed under the Endangered Species Act. [Available at: http://www.westcoast.fisheries.noaa.gov/publications/reference_documents/esa_refs/section4d/electro2000.pdf].

- ABMP-28.7: Individual organisms will be relocated the shortest distance possible to habitat unaffected by construction activities.
- ABMP-28.8: Within occupied habitat, capture, handling, exclusion, and relocation activities will be completed no earlier than 48 hours before construction begins to minimize the probability that listed species will recolonize the affected areas.
- ABMP-28.9: Within temporarily drained stream channel areas, salvage activities will be initiated before or at the same time as stream area draining and completed within a time frame necessary to avoid injury and mortality of listed species.
- ABMP-28.10: For projects that involve in-water activities, the project biologist will continuously monitor in-water activities (*e.g.*, placement of cofferdams, dewatering of isolated areas) for the purpose of removing and relocating any listed species that were not detected or could not be removed and relocated prior to construction.
- ABMP-28.11: The project biologist will be present at the work site until all listed species have been removed and relocated.
- ABMP-28.12: The project biologist will maintain detailed records of the species, numbers, life stages, and size classes of listed species observed, collected, relocated, injured, and killed; as well as recording the date and time of each activity or observation.

aa. Project Action-29: Implement BMPs

- ABMP-29.1: The proposed guidance document (described in Caltrans [2010] Programmatic BA) will be followed to ensure compliance with Project permits and authorization, including implementation of the BMPs.
- ABMP-29.2: Before construction activities begin, the project environmental coordinator or biologist will discuss the implementation of the required BMPs with the maintenance crew or construction resident engineer and contractor, and identify and document environmentally sensitive areas and potential occurrence of listed species.
- ABMP-29.3: Before construction activities begin, the project environmental coordinator or biologist will conduct a worker awareness training session for all construction personnel that describes the listed species and their habitat requirements, the specific measures being taken to protect individuals of listed species in the project area, and the boundaries within which project activities will be restricted.
- ABMP-29.4: Caltrans will designate a biological monitor to monitor on-site compliance with all Project BMPs and any unanticipated effects on listed species.
- ABMP-29.5: Non-compliance with BMPs and unanticipated effects on listed species will be reported to the resident engineer or maintenance supervisor immediately.
- ABMP-29.6: When non-compliance is reported, the resident engineer or maintenance supervisor will implement corrective actions immediately to meet all BMPs; where unanticipated effects on listed species cannot be immediately resolved, the resident engineer or maintenance supervisor will stop work that is causing the unanticipated effect until the unanticipated effects are resolved.

ab. Project Action-30: Mitigation framework for potential adverse impacts on species listed under California Endangered Species Act (CESA)

The intent of this Project Action is to ensure all impacts on state-listed species are fully mitigated. As part of the Program, Caltrans will mitigate adverse impacts (*i.e.*, take) of species listed under the CESA and in some cases the California Environmental Quality Act (CEQA). The mitigation approach could involve terrestrial or aquatic habitats. Typical mitigation actions involve offsetting anticipated adverse impacts of the Program through restoring in-stream habitat (*e.g.*, placement of LWD or gravel/rock/boulders), restoring or enhancing riparian habitat conditions, or improving fish passage. In some cases, maintenance projects could be self-mitigating, or projects intended to restore habitat could be proposed in the Program. A project involving fish passage that is self-mitigating would establish or enhance fish access to usable habitat and the anticipated increase in species numbers would compensate for species losses resulting from construction. If activities are not self-mitigating, Caltrans will provide financial assurances that mitigation measures will be carried out prior to undertaking activities resulting in mortalities to state-listed species. Caltrans will coordinate closely with CDFW to ensure that specific mitigation is appropriate for the impacts and species affected. Implementation of this action will be accomplished within the limits of this Program (described below in *Section II.B. Project Categorization, Limits, and Minimization Measures*). Actions will typically occur at sites where Caltrans determines one or more mitigation approaches can be implemented and anticipated habitat improvements offset impacts on covered species or their habitat associated with project implementation. At the start of each Caltrans fiscal year, Caltrans will determine the anticipated level of take of CESA-listed species associated with the Program and the watersheds in which this take will occur. Caltrans will then work to identify up to 10 potentially suitable mitigation options per District and present the CDFW with a recommendation of which options are most appropriate to offset the anticipated level of take for the year.

B. Project Categorization, Limits, and Minimization Measures

The following section outlines project-size limits and minimization measures developed by Caltrans and NMFS and specifically for the Program to protect ESA-listed species and their designated critical habitats. Projects are separated into three categories (Category 1, 2, and 3). Projects may be implemented only if they meet the project-size limits and adhere to the minimization measures outlined below in *Section 1. Category Limits and Minimization Measures*. Category 1 and 2 projects can be implemented without submitting a pre-project notification form to NMFS. Category 2 projects, however, require submission of an annual inventory and reporting list. Caltrans will submit a pre-project notification form to NMFS prior

to implementation of Category 3 projects in order to be included in the Program[2]. Completion of a post-project reporting form is also required for all Category 3 projects.

1. Category Limits and Minimization Measures

The following sections describe the Project Action-level minimization measures, limits, and exclusions for Category 1, 2, and 3 projects. If the proposed Project Actions for an individual Site-Specific Project do not meet (*e.g.*, exceed) the Category 1 or 2 minimization measures and limits, the project is under Category 3 and a pre-project notification form must be submitted by Caltrans to NMFS.

a. Cleaning

Project Action-4: Clean the roadway of sediment and debris from landslide, flood events, and construction.
Project Action -10: Remove and disturb upland, riparian, and wetland vegetation.
Project Action -16: Remove and disturb aquatic vegetation, stream sediment, and LWD.
Project Action -23: Clean, retrofit, or install culverts.

Category 1 cleaning projects involve the removal of up to two cubic yards of material below OHWL with hand tools only (if any life stage of listed fish is present) and with heavy equipment (if all life stages of listed fish are absent). Category 2 cleaning activities involve the removal of between two and five cubic yards of material below the OHWL using heavy equipment when all life stages of listed fish are absent. Category 3 cleaning activities involve the removal of between 2 and 10 cubic yards of material with hand tools below the OHWL when listed fish are present and up to 10 cubic yards of material below the OHWL using heavy equipment. All projects that require dewatering in anadromous waters or designated critical habitat, or capture and relocation of listed species are within Category 3. Therefore, the limits to these categories are as follows:

Category 1 Limits- Cleaning

- Cleaning with hand tools when any life stage of listed fish is present-
    - No more than 2 cubic yards of material may be removed if below the OHWL.
- Cleaning with heavy equipment when all life stages of listed fish absent-

[2] Based on NMFS' review, Project Actions for an individual Site-Specific Project that do not meet these minimization measures or limitations will not be included in this consultation, and therefore, a separate consultation with NMFS may be necessary.

    - No more than 2 cubic yards of material may be removed below the OHWL.

Category 2 Limits- Cleaning

- Cleaning with heavy equipment when all life stages of listed fish absent-
    - Between 2 and 5 cubic yards of material may be removed below the OHWL.

Category 3 Limits- Cleaning

- Cleaning with hand tools when any life stage of listed fish is present-
    - Between 2 and 10 cubic yards of material may be removed below the OHWL.
- Cleaning with heavy equipment when any life stage of listed fish is present-
    - No more than 10 cubic yards of material may be removed below the OHWL. Fish relocation may be required if listed fish are present (see *Section II.B.1.f. Dewatering and Fish Relocation* if applicable). In some instances, relocation may not be required for those fish present in areas not likely to be affected by cleaning activities (*i.e.*, side channels or off-channel pools not directly involved in the project). As in all Category 3 projects, this information will be provided in notifications forms prior to project implementation.

b. Vegetation Management

Project Action-10: Remove and disturb upland, riparian, and wetland vegetation.
Project Action-16: Remove and disturb aquatic vegetation, stream sediment, and LWD.

Vegetation management activities that are not a component of a larger project (*e.g.*, grading) involve the removal of vegetation for inspection of culverts or bridges or roadway safety. Category 1 vegetation removal around culverts will be accomplished with hand tools and occur between the roadway and the top of a culvert inlet or outlet (areas are described in greater detail in the list below). Category 1 vegetation removal around bridges will be accomplished by working from the bridge deck. Vegetation removal that cannot be accomplished from the bridge deck or, for culverts, requires vegetation removal below the top of a culvert is in Category 2. Category 2 vegetation removal around culverts or bridges will occur in an area extending from 20 linear feet upstream to 20 linear feet downstream of the edge of a bridge or culvert inlet or outlet (areas are described in greater detail in the list below). Vegetation removal that cannot be accomplished with only hand tools is in Category 3. An example of a vegetation management project involving roadway safety would be the removal of trees that could potentially fall and damage a bridge or culvert or present a roadway hazard. The limits to these categories are as follows:

Category 1 Limits - Vegetation Removal

- Culverts - vegetation removal with hand tools within an area between the roadway and a line running parallel to the roadway and along the top of a culvert inlet or outlet
    - Mature trees may not be removed (mature tree is defined as greater than 12 inches diameter at breast height [dbh]).
- Bridges - vegetation removal (primarily trimming) when working from the bridge deck
    - Mature trees may not be removed.

Category 2 Limits - Vegetation Removal

- Culverts - vegetation removal with hand tools within an area between two lines (parallel to the roadway) extending from 20 linear feet upstream of the culvert inlet to 20 linear feet downstream of the culvert outlet
    - Vegetation removal may not occur in the wetted channel;
    - Mature trees may not be removed; and
    - No more than a total of 5,000 square feet of vegetation may be removed below the OHWL or within 150 linear feet of the OHWL.
- Bridges - vegetation may not be removed outside of the area between two lines (parallel to the roadway) extending from 20 linear feet upstream from the upstream edge of a bridge to 20 linear feet downstream from the downstream edge of a bridge
    - Vegetation removal may not occur in the wetted channel;
    - Mature trees may not be removed; and
    - No more than a total of 5,000 square feet of vegetation may be removed below the OHWL or within 150 linear feet of the OHWL.

Category 3 Limits - Vegetation Removal

- Removal of vegetation with heavy equipment (which may also include use of hand tools) or removal of mature trees
    - Vegetation may not be removed outside of the area extending 20 linear feet from the edge of a bridge or culvert inlet or outlet (area described above); and
    - No more than a total of 5,000 square feet (0.11 acres) of vegetation may be removed below OHWL or within 150 linear feet of the OHWL (see *Section II.1.B.f. Dewatering and Fish Relocation* if applicable).

Caltrans or the Corps will implement the following procedures for management of large woody material[3] encountered at project sites. If the large woody material cannot be retained on site due to safety concerns (including relocating the wood downstream of Caltrans facilities), Caltrans or

[3] Large woody material is defined as logs or limbs greater than or equal to 24 inches in diameter and more than 20 feet in length and their associated root wads.

the Corps will coordinate with the necessary resource agencies (NMFS, USFWS, and CDFW) on potential options, including transfer of the wood to storage facilities for future use at other potential habitat enhancement sites. In the event local storage facilities are at capacity or unavailable in the area, and as agreed upon by the resource agencies, the large woody material can be disposed of at appropriate facilities or become the property of the contractor (if applicable).

c. Grading for Access Roads and Construction of Settling Basins and Storage Areas

Project Action-11: Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment.
Project Action-12: Construct temporary sediment-settling basins.
Project Action-13: Grade temporary access roads and traffic detours.

Category 1 projects involve construction of access roads or storage areas outside of wetted channels, hydrologically connected areas, and greater than 150 linear feet from OHWL or any watercourse. Category 2 projects involve construction of access roads or storage areas outside of wetted channels and above the OHWL. Category 3 projects involve construction of access roads below the OHWL but outside of wetted channels, and construction of storage areas outside of wetted channels and above the OHWL. Therefore, the limits to these categories are as follows:

Category 1 Limits - Grading

- Construction of access roads or storage areas greater than 150 linear feet from the OHWL or any watercourse
    - Access roads or storage areas may not be constructed in wetted channels; and
    - Access roads or storage areas may not be hydrologically connected to watercourses.

Category 2 Limits - Grading

- Construction of access roads or storage areas within 150 linear feet of the OHWL
    - Access roads or storage areas may not be constructed below the OHWL;
    - Access roads or storage areas may not be constructed in wetted channels or designated critical habitat; and
    - Storage areas may not exceed 5,000 square feet in area.

Category 3 Limits - Grading

- Construction of access roads within critical habitat or below the OHWL
    - Access roads may not be constructed in wetted channels.

- Construction of storage areas exceeding 5,000 square feet in areas above the OHWL
    - Storage areas may not be constructed in wetted channels or designated critical habitat.

d. Installation of Rock Slope Protection/erosion control materials

Project Action-13: Grade temporary access roads, traffic detours.
Project Action-20: Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining Walls.

Category 1 projects involve placement of erosion control materials outside of designated critical habitat or anadromous waters. Category 2 projects involve placement of erosion control materials (excluding RSP, sheet piles, retaining walls) within designated critical habitat or other anadromous waters. Category 3 projects involve placement of RSP, sheet piles, or retaining walls for slide, bridge, culvert, or stream bank stabilization. Therefore, the limits to these categories are as follows:

Category 1 Limits - Erosion Control

- Placement RSP, sheet piles, retaining walls or other erosion control materials outside designated critical habitat or anadromous waters.

Category 2 Limits - Erosion Control

- Placement of erosion control materials in designated critical habitat or anadromous waters
    - RSP, sheet piles, or retaining walls may not be placed within designated critical habitat or anadromous waters; and
    - Erosion control materials may not be placed in the wetted channel.

Category 3 Limits - Erosion Control

- Placement of erosion control materials in designated critical habitat or anadromous waters
    - No more than 150 linear feet per stream bank may be stabilized using RSP, sheet piles, or retaining walls as part of a slide, bridge, or bank stabilization project; and
    - No more than 50 linear feet per stream bank may be stabilized using RSP, sheet piles, or retaining walls at either the outlet side or inlet side as part of a culvert project.

e. Drilling Geotechnical Test Holes

Project Action-8: Use drill rigs and drilling lubricants.

Category 1 projects involve geotechnical drilling in dry channels above the OHWL and outside of designated critical habitat. Category 2 projects involve geotechnical drilling in dry channels in designated critical habitat or other anadromous waters. Category 3 projects involve geotechnical drilling in the wetted channel in designated critical habitat or other anadromous waters. Therefore, the limits to these categories are as follows:

Category 1 Limits - Geotechnical Drilling

- Geotechnical drilling above the OHWL
    - Geotechnical drilling may not take place in wetted channels or designated critical habitat.

Category 2 Limits - Geotechnical Drilling

- Geotechnical drilling below the OHWL or within designated critical habitat
    - Geotechnical drilling may not take place in wetted channels.

Category 3 Limits - Geotechnical Drilling

- Geotechnical drilling in wetted channels
    - Heavy equipment, with the exception of drilling casings or temporary barge supports, may not enter the wetted channel unless all life stages of listed species are absent. It is anticipated that clean gravel pads may be constructed in wetted channels to allow access for drill equipment. Gravel pads will be removed post-drilling unless specifically requested in writing by NMFS.

f. Dewatering and Fish Relocation

Project Action-17: Install temporary cofferdams and diversion cofferdams.
Project Action-18: Temporarily redirect stream flow.
Project Action -28: Capture, handle, exclude, salvage, and relocate listed species.

Category 1 involves dewatering in non-fish bearing streams. Category 2 involves dewatering and fish relocation outside of designated critical habitat and anadromous waters when there is no chance of encountering any life stages of listed species. Category 3 involves all dewatering and fish relocation activities in designated critical habitat or anadromous waters or when any life stage of listed fish species are present. Therefore, the limits to these categories are as follows:

Category 1 Limit - Dewatering and Fish Relocation

- Dewatering in non-fish bearing streams.

Category 2 Limits - Dewatering and Fish Relocation

- Dewatering and fish relocation outside anadromous waters or designated critical habitat.

Category 3 Limits - Dewatering and Fish Relocation

- Dewatering and fish relocation involving the **c**apture, handling, exclusion, or salvage of listed species
    - No more than 10 projects per Caltrans District (30 total) may occur annually.

g. Rehabilitation, Retrofit, and Repair of Culverts and Bridges

Project Action-9: Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure.
Project Action-14: Operate construction equipment and vehicles in the stream channel.
Project Action-15: Construct temporary stream crossings.
Project Action-20: Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls.
Project Action-21: Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications.
Project Action-23: Clean, retrofit, or install culverts.
Project Action-25: Remove existing bridge structure, including footings, piers, and piles.
Project Action-26: Install bridge structures, excluding impact pile-driving.

Category 1 projects involve rehabilitation, retrofit, or repair of culverts or bridges outside designated critical habitat or anadromous waters. Category 2 projects involve rehabilitation, retrofit, or repair of culverts or bridge superstructure (above the OHWL) within designated critical habitat or anadromous waters. Category 3 projects involve rehabilitation, retrofit, or repair of culverts or bridges in designated critical habitat or anadromous waters. Therefore, the limits to these categories are as follows:

Category 1 Limits - Rehabilitation, Retrofit, and Repair of Culverts and Bridges

- Rehabilitation, retrofit, or repair of culverts or bridges outside anadromous waters or designated critical habitat.

Category 2 Limits - Rehabilitation, Retrofit, and Repair of Culverts and Bridges

- Rehabilitation, retrofit, or repair of culvert or bridge superstructure within anadromous waters or designated critical habitat
    - Activities associated with rehabilitation, retrofit, or repair of culverts or bridges may not occur below the OHWL.

Category 3 Limits - Rehabilitation, Retrofit, and Repair of Culverts and Bridges

- Rehabilitation, retrofit, or repair of culverts or bridges within designated critical habitat or anadromous waters
    - Designs that involve major channel modification are only included in the Program in exceptional cases (see following bullet). Channel modification is defined as directly and/or indirectly modifying and/or permanently degrading natural channel forming processes and morphology of perennial, intermittent and ephemeral streams, and estuarine habitats. Channel modification includes the following design elements or construction methods: (1) grade control; (2) channel redirection or guide structures; or (3) fishways.
    - Rehabilitation, retrofit, or repair of culverts or bridges that involve channel modification will only occur in lieu of total replacement or removal of inadequate facilities in cases where replacement or removal is infeasible or unreasonable. In these cases, Caltrans will provide rationale for finding replacement infeasible or unreasonable early in the project delivery process (prior to development of an environmental document). Caltrans will provide a copy of this rationale in the pre-project notification form.

h. Replacement of Culverts and Bridges

Project Action-22: Remove culverts.
Project Action-23: Clean, retrofit, or install culverts.
Project Action-25: Remove existing bridge structure, including footings, piers, and piles.
Project Action-26: Install bridge structures, excluding impact pile-driving.

All culvert and bridge replacements covered in the Program require a post-project reporting and are beyond the limits of Category 1. Category 2 involves culvert and bridge replacement in non-fish bearing streams. All culvert and bridge replacement in fish bearing streams are in Category 3. Therefore, the limits to these categories are as follows:

Category 1 Limits - Replacement of Culverts and Bridges

- Culvert and bridge replacement is not included include in Category 1.

Category 2 Limits - Replacement of Culverts and Bridges

- Replacement of culverts and bridges in non-fish bearing streams.

Category 3 Limits - Replacement of Culverts and Bridges

- Culvert and bridge replacement activities in fish bearing streams
    - The following culverts or bridge designs will be covered under the Program and, generally, designs should be selected in this order of preference: (1) hydraulically transparent crossing design (*i.e.,* full floodplain spanning bridge); (2) streambed simulation strategies[4] involving a bottomless arch or box culvert; or 3) streambed simulation or active channel strategies involving sufficiently-sized and sloped embedded culvert.
    - Designs that involve major channel modification (defined above) are not included in the Program. Channel modification includes the following design elements or construction methods: (1) grade control; (2) channel redirection or guide structures; or (3) fishways.

Culvert and Bridge Replacement Objectives

For the lifespan of a culvert or bridge, hydraulic sections will have the capacity to transport wood, water and sediment. Thus culverts or bridges constructed in the Program are not expected to cause aggradation or degradation to a level that will adversely affect geomorphic processes and fish passage. With the exception of RSP to protect wingwalls and bridge abutments, structures that influence geomorphic processes are not anticipated in new design proposals.

Culvert and Bridge Replacement Design Targets

Removal and replacement of culverts or bridges will occur in two general channel types - confined or alluvial channels. A confined channel is unable to shift laterally because it is bounded by geologic valley walls, or other non-deformable boundaries. An alluvial channel is formed in material (sand, gravel, cobbles, or small boulders) that moves during floods. Alluvial

[4] Stream simulation strategies such as "Active Channel and Stream Simulation Design Methods" are described in greater detail in the NMFS Southwest Region Guidelines for Salmonid Passage at Stream Crossings, September 2001.

channels convey channel bed and bank materials under present flow conditions and adjust their location, dimensions, shape, and gradient under the present hydrologic regime. For the most part, streamflow, sediment supply, boundary resistance and woody debris control how alluvial channels change over time.

The above objectives can be achieved by meeting the following design targets for the two channel types:

- *Confined channel* – the hydraulic section of the culvert or bridge will have the capacity to transport sediment and not aggrade or degrade up to at least a flood event occurring on a 20 year recurrence interval (Q_{20}). This may be achieved if the crossing does not affect a stage change of more than 0.5 feet above what would occur in a channel with natural grade and no artificial confinements or controls at Q_{20}.

- *Alluvial channel* - the minimum culvert or bridge width will be equal to or greater than the active channel width, defined as the 'channel migration zone' (CMZ) width. Delineation of the CMZ width would include the stream meander belt width, relative to the lifespan of the structure. For example, a bridge designed for a lifetime of 100 years should not be smaller than the previous 100 year CMZ and the projected future 100 year CMZ width (CMZ_{100}).

In some cases, particularly in confined channels, it may be possible to design a culvert crossing that will not cause significant aggradation at the inlet and degradation at the outlet with an alternative to the design target described above. In those cases Caltrans will provide designs and rationale to NMFS early in the project development process (prior to completion of an environmental document) for their review. NMFS will either agree or disagree with the Caltrans finding that the design will be likely to provide sustained capacity to transport wood, water, and sediment and provide passage for anadromous fish. If NMFS does not agree with the Caltrans rationale, the project will either be redesigned or consulted on individually outside of this Program.

C. Oversight and Administration

The Program includes Federally funded and non-Federally funded infrastructure projects that meet Program criteria described above. Caltrans will be the Federal lead on Federally funded projects; and the Corps will be the Federal lead on a small number of projects that lack Federal funding. Under the latter scenario, Caltrans will be the applicant as defined by 50 CFR 402.02. Caltrans, however, is responsible for administering and overseeing all projects in the Program.

All projects in the Program will have a Caltrans point of contact. Caltrans points of contact include maintenance supervisors and environmental leads that have received Program training.

For Category 1 projects the point of contact will typically be the maintenance supervisor that oversees the area where the project is occurring. For Category 2 and 3 projects the point of contact will typically be the maintenance or capital environmental lead, depending on which division is implementing the specific project. One District environmental lead (maintenance environmental support staff or environmental capital project delivery staff) will be designated as the Program administrative environmental lead and ultimately responsible for all District-wide Program coordination and administration (*e.g.*, submitting forms, project inventory, training). All maintenance supervisors and environmental leads involved in the Program will receive training in Program limits, project categorization, minimization measures, and administration. The same point of contact structure will apply to all projects in the Program regardless of whether Caltrans or the Corps is the specific Federal lead. Projects may be implemented by non-Caltrans staff. The Caltrans point of contact, however, is responsible for informing the on-site supervisor of Category limits, overseeing project implementation, and completing applicable reporting forms. Furthermore, applicable Program and Category limits will be clearly described in project contracts or work orders; Caltrans points of contact will notify NMFS within 24 hours of learning a project has exceeded Category or Program limits. The following list describes Caltrans proposed oversight and administration measures:

1. Category 1 Projects

Caltrans will not provide notification forms or reporting forms to NMFS for Category 1 projects.

2. Category 2 Projects

Caltrans will not provide a Notification Form for Category 2 projects. A Category 2 Reporting Form will be provided to NMFS by the Caltrans point of contact (Enclosure 4) when each Category 2 project is complete. Information included in these forms will be kept in an annual inventory list (*i.e.*, spreadsheet), maintained by the Caltrans District environmental lead which will be submitted to NMFS as described below in *Section II.C.5 Reporting and Monitoring*.

3. Category 3 Projects

Caltrans will provide NMFS a Category 3 Notification Form (Enclosure 4) for all anticipated Category 3 projects (described above). Caltrans District leads will provide a Category 3 Notification Form to the NMFS Northern California Office (NCO) and/or North-Central Coast Office (NCCO) staff. To help ensure fish handling and relocation remains below numbers analyzed and covered under this Program, Caltrans will include annual numbers (current and anticipated) of fish capture and mortality by District in the table included in the Category 3 Notification Form. Category 3 Reporting Forms (Enclosure 4) are required for all completed Category 3 projects as described below in *Section II.C.5 Reporting and Monitoring*.

4. Notification Requirements

Caltrans will provide NMFS the Category 3 Notification Form described above at least 28 days (four weeks) prior to project construction. Notification to NMFS by Caltrans can be an electronic mail or fax to specified contacts in NMFS Area Offices based on the location of the proposed project:

- *Northern California Office:* Chuck Glasgow, NMFS, 1655 Heindon Road, Arcata, CA 95521; chuck.glasgow@noaa.gov; fax: (707)-825-4840.

- *North-Central Coast Office*: Joel Casagrande or Joe Heublein, NMFS, 777 Sonoma Ave, Room 325, Santa Rosa, CA 95404; joel.casagrande@noaa.gov, joe.heublein@noaa.gove; fax: (707) 575-6050.

The Category 3 Notification Form does not require a response from NMFS for a project to proceed; however, if NMFS has concerns with the project after receiving the form, NMFS will contact Caltrans within 28 days of receipt of the form with any listed species or critical habitat concerns, including whether the proposed project qualifies for the Program. If the project is not completed in the same calendar year, then Caltrans will provide a new Category 3 Notification Form for the same project in subsequent years. Any projects that NMFS indicates do not fit the Program may be further clarified or developed by Caltrans. New project information would then be provided to NMFS for comment.

5. Reporting and Monitoring

Completed forms and lists will be provided to the specified contacts in the NMFS NCO and/or NCCO listed above. Post-project reporting forms and lists will be submitted as follows:

a. Category 3: Submit electronic reporting forms to NMFS within 10 business days of project completion.
b. Category 2 and 3: Prior to February 15, submit an electronic and hard copy of all notification and reporting forms (Category 3), and an annual inventory reporting list (Category 2) from the previous calendar year to NMFS.

Caltrans has an ongoing monitoring program associated with its statewide stormwater permit (SSWP)[5], issued by the State Water Resources Control Board. Under the SSWP, Caltrans must monitor BMPs associated with Program activities as described in Appendix C of Caltrans' Programmatic BA (Caltrans 2010). Monitoring strategies that involve both self-monitoring and monitoring by consultant auditors are employed to check on the reasoned and appropriate application of BMPs as well as the effectiveness of those BMPs as applied. Both focused and

[5] http://www.swrcb.ca.gov/water_issues/programs/stormwater/caltrans.shtml

random inspections of sites are undertaken to ensure that the stormwater program is being implemented as designed and that new BMPs are developed and implemented when indicated. Additional layers of protection and enhancement, beyond the SSWP-related BMPs, are realized though the State Water Resources Control Board's total maximum daily load (TMDL) process.

In additional to ongoing SSWP monitoring program described above, Caltrans proposes to monitor implementation of a subset of projects per District. At least one Category 3 (if implemented) and one Category 2 project per district will be monitored each year. The total number of projects monitored each year will depend on the number of projects implemented. Project sites will be selected by Caltrans. The intent of this monitoring is to: (1) ensure adherence to all criteria and requirements (*i.e.*, projects were constructed as proposed); (2) monitor BMP and ABMP implementation and effectiveness (see SSWP monitoring above); and (3) identify potential unanticipated effects to listed species and/or critical habitat.

Monitoring will involve field reviews of a subset of projects (described in the preceding paragraph) implemented under the Program annually. Caltrans will invite NMFS staff to participate in project evaluation and field review. The field reviews will be conducted following project completion and may be re-visited after the following winter season. Caltrans will summarize the data from each site visit in a brief narrative that will include: (1) a summary of site review and monitoring data; (2) a discussion of implementation effectiveness; and (3) a discussion of the clarity and effectiveness of the forms and monitoring. Caltrans will submit the results of all monitoring field reviews, including the results of the SSWP monitoring, to NMFS (see contacts above) by April 15 of the following year (this date can be extended if it is mutually agreed to by NMFS and Caltrans).

6. <u>Annual Meeting, Program Evaluation, and Training</u>

Caltrans will meet annually with NMFS (or more frequently if needed), for the following purposes: (1) for annual review of covered Project Actions; (2) to evaluate and discuss the effectiveness of the Program; and (3) to ensure that activities implemented under the Program continue to minimize adverse effects to listed species and critical habitat. During annual meetings, Caltrans and NMFS will evaluate and discuss the procedures for managing large woody material encountered at project sites as outlined above in *Section II.B. Project Categorization, Limits and Minimization Measures*.

To assist Caltrans with achieving consistent administration and implementation of the Program within and between all three Districts, Caltrans proposes to give an annual training to maintenance and environmental staff that describes the activities covered by the Program , the information necessary for submittal of notification forms, reporting forms, reporting lists, and additional monitoring requirements. The goal of this training will be to provide the appropriate level of training to staff to ensure that projects are accurately categorized and implemented as

described. In addition the training will cover reporting and pre-notification responsibilities. A Caltrans environmental senior and District maintenance manager in each District are responsible for coordinating and implementing the annual Program training. NMFS staff will be invited to attend and assist the training.

7. Elevation/Issue Resolution

Caltrans proposes that if an issue cannot be resolved between Caltrans and NMFS staff, the issue will be elevated to the management level. Managers and staff will then meet to document and discuss the issues, and will work together to come to an agreement. Issues should be elevated when consensus cannot be reached regarding project categorization; adequacy of avoidance, minimization, or other mitigation measures; or issues related to Program inclusion. In addition, questions about relevant laws, regulations, or policy may be elevated. If managers and staff cannot resolve an issue, then the issue will be raised to the next higher level of each agency (policy level).

D. Action Area

The California Resources Agency identifies 10 hydrologic regions throughout the state. Those within the proposed action area include the North Coast, San Francisco Bay, and the Central Coast regions. The action area includes all of Caltrans District 4 and the portions of Caltrans districts 1 and 2 that lie within Figure 1. The portions of each region included in the action area are briefly described below.

1. North Coast

The North Coast region includes all streams in California draining to the Pacific Ocean north of San Francisco Bay. North coast streams pass through or drain from the California coastal mountains. These are typically high-gradient streams with small estuaries. Watersheds are often rugged, with steep valley sides. Valleys are often heavily forested with conifer and mixed evergreen forests and include species such as coast redwood (*Sequoia sempervirens*), Douglas-fir (*Pseudotsuga menziesii*), tanoak (*Notholithocarpus densiflorus*), madrone (*Arbutus menziesii*), California bay laurel (*Umbellularia californica*), and golden chinquapin (*Chrysolepis chrysophylla*). Ridge tops often support chaparral and grassland communities, some coastal areas are occupied by maritime chaparral or coastal scrub communities, and inland valleys and foothill regions are often occupied by oak (*Quercus spp.*) woodland and chaparral communities.

All North Coast watersheds have been affected by various human activities including logging, mining, ranching and agriculture. In the North Coast region, urban centers are few, relatively small in size, and primarily occur along the coast. In this region, waterways and wetlands have

been impacted by sedimentation, loss of estuarine habitat, removal of large woody debris, and streamflow diversions.

Major river systems in the North Coast region include (from north to south): Smith River, Klamath River, Eel River, Mattole River, Ten Mile River, Noyo River, Garcia River, Gualala River, and the Russian River.

ESA-listed fish species under NMFS jurisdiction found in watersheds of the North Coast region include SONCC and CCC coho salmon ESUs, CC Chinook salmon ESU, NC and CCC steelhead DPSs, the Southern DPS of North American green sturgeon, and the southern DPS of Pacific eulachon.

2. San Francisco Bay

The San Francisco Bay region consists of San Francisco Bay and its tributaries (excluding the Sacramento and San Joaquin rivers), the western portion of the Sacramento River–San Joaquin River Delta in eastern Solano and Contra Costa counties, and the coastal streams of the San Francisco Peninsula southward to Pescadero Creek (inclusive). Most of the coastal watersheds in southern Marin County and the San Francisco Peninsula drain valleys dominated by mixed coniferous forests in the headwaters and mixed communities of coastal chaparral, grasslands, and oak woodland on the lower marine terraces. Low elevation stream corridors typically support a mixed willow (*Salix spp.*) and red alder (*Alnus rubra*) riparian community.

San Francisco Bay is the largest estuary on the west coast. It has been highly modified by extensive urbanization, diking and drainage of wetlands, and diversion of significant inflow from the Sacramento and San Joaquin Rivers. Despite extensive environmental degradation, San Francisco Bay and the Delta provide important habitat for protected estuarine resident species (*e.g.,* delta smelt) and ESA-listed anadromous species (*e.g.,* Chinook salmon, steelhead, and green sturgeon).

Major tributaries to San Francisco Bay (excluding the Sacramento and San Joaquin rivers) include the Petaluma River, Napa River, Alameda Creek, Coyote Creek, Guadalupe River, San Francisquito Creek and San Mateo Creek. These tributaries drain arid inland valleys dominated by oak woodlands and chaparral. Many of these drainages are heavily urbanized at lower elevations. Major coastal draining streams of the San Francisco Peninsula include Pilarcitos Creek, Tunitas Creek, San Gregorio Creek, and Pescadero Creek. Many of these coastal systems form bar-built estuaries, or lagoons in summer, which provide important rearing habitats for rearing juvenile salmonids. Major tributaries to the Delta in eastern Contra Costa and Solano counties include Kellogg Creek, Marsh Creek (eastern Contra Costa County), Cache Slough (Ulatis and Alamo creeks), and Lindsay Slough (eastern Solano County).

ESA-listed fish species under NMFS jurisdiction found in watersheds of the San Francisco Bay region include the CCC and CV steelhead DPSs, SRWR and CVSR Chinook salmon ESUs, CCC coho salmon, and southern DPS green sturgeon. Anadromous salmonids and sturgeon migrate through San Francisco Bay and the Delta during their outmigration to the ocean and during their upstream migration to spawn in the Sacramento and San Joaquin River systems and tributaries of the bay.

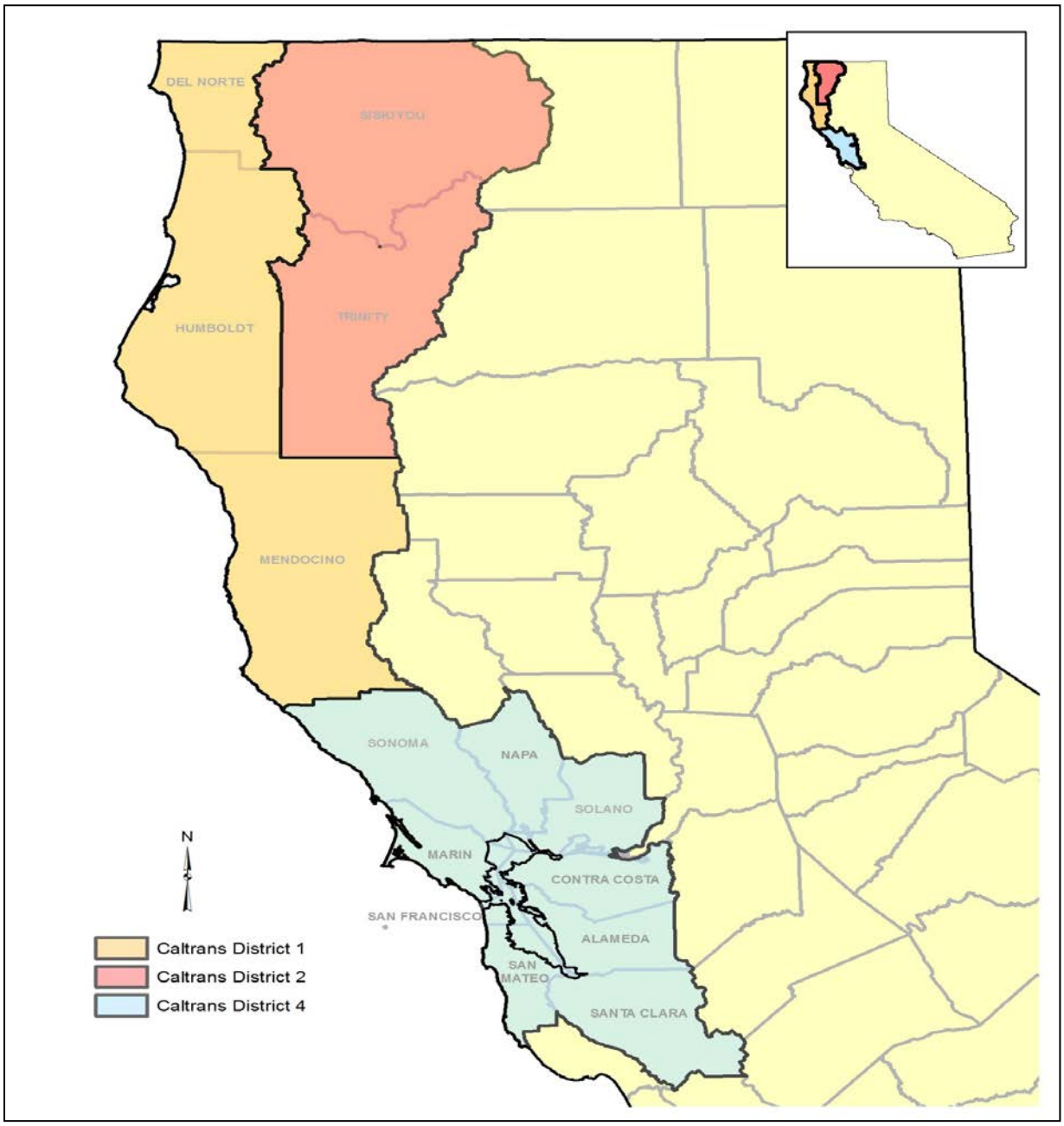

Figure 1. Program action area for the routine maintenance and repair activities in Districts 1, 2, and 4.

3. Central Coast

The Central Coast region encompasses coastal draining watersheds from Pescadero Creek Lagoon (included in the San Francisco Bay region) in San Mateo County south to the Carpinteria salt marsh in Santa Barbara County. However, the action area includes only a portion of this region that overlaps with a portion of Caltrans District 4. Only two small coastal streams from the Central Coast region, Arroyo de los Frijoles and Gazos Creek, are included in the action area. These watersheds drain through valleys on the west slope of the Santa Cruz Mountain Range. The steeper canyons are predominantly occupied by mixed evergreen forests with species such as redwood, Douglas fir, California bay laurel, tanoak, and madrone. Oak woodland, oak-savanna, coastal scrub, maritime chaparral, and grassland communities occupy the foothill and coastal terrace regions. The program also includes streams in the Upper Pajaro River watershed that are within Caltrans District 4 (*i.e.*, those in southern Santa Clara County). These streams drain the east slope of the Santa Cruz Mountains (*e.g.*, Uvas and Llagas creeks) and the west slope of the Diablo Range (*e.g.*, Pacheco Creek). Oak woodland is more common in these drier watersheds and riparian areas are dominated by willow and California sycamore (*Platanus racemosa*). In southern Santa Clara County, agricultural areas are extensive on the valley bottoms. Much of the valley floor and coastal plain habitats in the Central Coast region have been developed for agriculture or urban uses. As a result, many streams and wetlands in this region have been highly degraded due to floodplain encroachment, channelization, removal of riparian vegetation, sedimentation, and impaired water quality and quantity.

ESA-listed fish species under NMFS jurisdiction found in the action area in the Central Coast region include the CCC and SCCC steelhead DPSs and the CCC coho salmon ESU.

III. ANALYTICAL FRAMEWORK

A. Jeopardy Analysis

In accordance with policy and regulation, a jeopardy analysis relies on four components: (1) the Status of the Species, which summarizes 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,[6] which generally analyzes the condition of ESA-listed species in the action area, the factors responsible for that condition, and the relationship of the action area to the likelihood of both the survival and recovery of ESA-listed species; (3) the Effects of the

[6] Specifically, 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 impact of State or private actions which are contemporaneous with the consultation in process (50 CFR §402.02).

Action,[7] which generally includes 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,[8] which generally evaluates the effects of future, non-Federal activities in the action area on ESA-listed species.

The jeopardy determination is made by adding the effects of the proposed Federal action and any Cumulative Effects to the Environmental Baseline and then determining if the resulting changes in species status reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

The jeopardy analysis 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 species in the action area will impact their respective population. If the population will be impacted, we then assess whether this impact is likely to affect the ability of the populations to support the survival and recovery of the ESU/DPS.

B. Destruction or Adverse Modification Determination

In this biological opinion, NMFS 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, in which NMFS evaluates the range-wide condition of critical habitat for the ESA-listed species in terms of primary constituent elements (PCEs, such as sites for spawning, rearing, and migration), the factors responsible for that condition, and the conservation value of the critical habitat overall; (2) the Environmental Baseline, which generally 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

[7] Specifically, Effects of the Action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR § 402.02).

[8] Specifically, Cumulative Effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR § 402.02).

of the Action, which generally includes 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 generally 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 when analyzed in the context described above will negatively affect PCEs of critical habitat in the action area, we then assess whether or not this reduction is likely to cause an appreciable reduction in the conservation value of critical habitat range-wide.

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 numerous 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. A copy of the administrative record for this consultation is on file with the NMFS California Coastal Area Office.

IV. STATUS OF THE SPECIES/CRITICAL HABITAT

In this section of the Biological Opinion, we describe the threatened and endangered species and their designated critical habitat that occur in the action area and that may be exposed to the direct or indirect effects of the proposed action. NMFS has determined that the following species and critical habitat occur within the action area:

Threatened Southern Oregon/Northern California Coast (SONCC) coho salmon ESU
- Listing determination (70 FR 37160, June 28, 2005)
- Critical habitat designation (64 FR 24049, May 5, 1999);

Endangered Central California Coast (CCC) coho salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (64 FR 24049, May 5, 1999);

Threatened California Coastal (CC) Chinook salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (70 FR 52488, September 2, 2005);

Endangered Sacramento River Winter-run (SRWR) Chinook salmon ESU
Listing determination (59 FR 440, January 4, 1994)
Critical habitat designation (58 FR 33212, June 16, 1993);

Threatened Central Valley Spring-run (CVSR) Chinook salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened Northern California (NC) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened Central California Coast (CCC) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened South Central California Coast (SCCC) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened California Central Valley (CV) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened Southern DPS of North American green sturgeon
Listing determination (71 FR 17757, April 7, 2006)
Critical habitat designation (74 FR 52300, October 9, 2009);

Threatened Southern DPS of Pacific eulachon
Listing determination (75 FR 13012, March 18, 2010)
Critical habitat designation (76 FR 65324, October 20, 2011).

In California, designated critical habitat (58 FR 45269, August 27, 1993) for the threatened

Eastern Population Segment of Steller sea lion is limited to Sugarloaf Island near Cape Mendocino and Año Nuevo Island off the southern San Mateo County coast. These islands are not within the action area and the closest Caltrans-owned infrastructure is over one mile away (State Route 1). Therefore, the proposed action will have no effect on designated critical habitat for the threatened Eastern Population Segment of Steller sea lion, and this critical habitat will not be considered further in this biological opinion.

A. Species Description and Life History

1. Coho salmon

The life history of 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, coho salmon fry 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 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). Survival of young coho salmon drops sharply when fine sediment makes up 15 percent or more of the substrate (Quinn 2005).

2. Chinook salmon

Chinook salmon are the largest member of the *Oncorhynchus* genus, with adults weighing more than 120 pounds 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. Juvenile ocean-type Chinook salmon (the life-history type present in the action area) emigrate to estuarine or marine environments shortly after emergence from the redd (Healey 1991). 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. 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.

For the ocean type life-history, 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 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, 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). Juvenile 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.

3. Steelhead

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 flows 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). Smolt out-migration typically occurs from February through June, with peak periods in April and May (Fukushima and Lesh 1998). Outmigration appears to be more closely associated with size than age and a decline in the hydrograph (Shapovalov and Taft 1954). Once in the ocean, the distribution of steelhead is not well known. Coded wire tag recoveries indicate most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986).

For steelhead embryos, survival to emergence is inversely related to the proportion of fine sediment in the spawning gravels. Steelhead are slightly more tolerant of sediment levels 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 steelhead for rearing is much more

extensive. Studies have confirmed estuaries (including seasonal, bar-built lagoons) play an important role in their lifecycle because they are generally more productive than upstream riverine habitats, growth while rearing in the lagoon is often substantial and, therefore, achieving a larger size prior to ocean entry greatly improves 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 determining distribution, survival, and growth. Water temperature affects the metabolic rate of rearing juvenile steelhead which, in turn, influences growth, survival, and habitat selection (Smith and Li 1983, Barnhart 1986, Myrick and Cech 2005, Casagrande 2010). Optimal temperatures for steelhead growth are between 10 and 20°C (Hokanson *et al.* 1977, Wurtsbaugh and Davis 1977, Myrick and Cech 2005). Variability in the diurnal water temperature range is also important for survival and growth (Hokanson *et al.* 1977, Busby *et al.* 1996).

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 result in a decrease in water clarity, or turbidity. This directly impairs visibility for feeding and, depending on the severity and duration, turbidity 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 thereby impacting invertebrate production and community composition (Waters 1995). As noted above for other salmonids, a high concentration of fine sediments will 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.

4. Green sturgeon

The North American green sturgeon ranges from the Bering Sea, Alaska, to Ensenada, Mexico. Presently, spawning has been confirmed to occur in the Klamath and Rogue rivers (Northern DPS) and the Sacramento and Feather rivers[9] (Southern DPS). Adults spawn in large rivers during the spring and early summer and eggs are laid in turbulent areas on the river bottom and settle into the interstitial spaces between cobble and gravel (Adams *et al*. 2007). Green sturgeon require cool water temperatures for egg and larval development, with optimal temperatures ranging from 11 to 17 ˚C (Van Eenennaam *et al*. 2005). Eggs hatch after 6–8 days, and larval feeding begins 10–15 days post-hatch; metamorphosis of larvae into juveniles typically occurs after a minimum of 45 days (post-hatch) when fish have reached 60–80 mm total length (TL) (Beamesderfer *et al*. 2007). After rearing in freshwater or the estuary of their natal river for one to four years, young green sturgeon move into coastal waters (Nakamoto *et al*. 1995, Adams *et*

[9] Spawning was recently confirmed in the Feather River downstream of Oroville Dam (Findings reported in annual report for 2011 4(d) project 16073: Lower Feather River Green Sturgeon Spawning Survey by A. Seesholtz, DWR).

al. 2002). Juvenile green sturgeon captured in the Klamath River estuary ranged from 320 to 660 mm TL (Nakamoto *et al.* 1995). Records of juvenile green sturgeon in San Francisco estuary are limited, but juveniles captured in the Delta are typically greater than 200 mm TL (Adams *et al.* 2002), suggesting Southern DPS green sturgeon also spend several months rearing in freshwater before entering the estuary. Laboratory studies, conducted by Allen and Cech, Jr. (2007), indicated juveniles approximately 6 months old (approximately 34 cm TL) were tolerant of saltwater, but approximately 1.5 year old (approximately 75 cm TL) green sturgeon appeared more capable of successful osmoregulation in salt water. Furthermore, green sturgeon observed from coastal marine waters in limited entry groundfish bottom trawl and California halibut commercial fisheries between 2007 and December 2010 (n=88) were greater than 60 cm fork length (or greater than approximately 65 cm TL) (WCGOP 2011, unpublished data). Green sturgeon are one of the most marine-oriented and widely distributed of the sturgeons; sexually immature fish that have entered coastal marine waters ("subadults ") spend several years at sea before reaching reproductive maturity and returning to freshwater to spawn for the first time (Nakamoto *et al*. 1995).

The length at first reproductive maturity is estimated to be 152 cm TL (14-16 years) for males and 162 cm TL (16-20 years) for females in the Klamath River (Van Eenennaam *et al*. 2006), and 145 cm TL for males and 166 cm TL for females in the Rogue River (Erickson and Webb 2007). Adult green sturgeon are iteroparous and believed to spawn every 2-4 years (Moyle 2002, Erickson and Webb 2007). Although males are capable of spawning annually, female sturgeon typically require two years to complete vitellogenesis (*i.e.,* process of yolk formation necessary prior to spawning).

Mature green sturgeon enter their natal river in the spring and, in the Northern DPS, typically leave the river during the subsequent autumn when water temperatures drop below 10 °C and flows increase (Erickson and Webb 2007). Telemetry studies by Heublein *et al.* (2009) revealed adults typically enter San Francisco Bay and begin their upstream spawning migrations between late February and early May. Based on egg capture and upstream migration of tagged fish, peak spawning is estimated to occur in deep turbulent sections of the Sacramento River between April and mid-June (Poytress *et al*. 2011, Heublein *et al.* 2009). In the Southern DPS, tagged adult green sturgeon displayed two outmigration strategies; presumably after spawning, green sturgeon emigrated from Sacramento River during summer months, or remained in the river until the onset of winter flows (Heublein *et al.* 2009).

Subadult and adult green sturgeon move between coastal waters and various estuaries along the U.S. West Coast between San Francisco Bay, California, and Grays Harbor, Washington (Lindley *et al*. 2008, Lindley *et al*. 2011). Multiple rivers and estuaries are visited by dense aggregations of green sturgeon in summer months (Moser and Lindley 2007, Lindley *et al*. 2011). Notably, capture of green sturgeon in San Pablo Bay and detections of tagged green

sturgeon indicated adult and subadult green sturgeon can be present in the Bay during all months of the year (Kelly *et al*. 2007, Heublein *et al.* 2009, Lindley *et al.* 2011). Relatively little is known about how green sturgeon use habitats in the coastal ocean and in estuaries, or the purpose of their episodic aggregations there at certain times (Lindley *et al*. 2008, Lindley *et al*. 2011). Genetic studies examining the stock composition of estuarine aggregations (Israel *et al*. 2009) indicate that almost all green sturgeon in the San Francisco Bay system belong to the Southern DPS. This is corroborated by tagging and tracking studies which found that no green sturgeon tagged in the Klamath or Rogue rivers (*i.e.,* Northern DPS spawning rivers) were detected in San Francisco Bay (Lindley *et al*. 2011). However, green sturgeon in coastal waters adjacent to San Francisco Bay may include Northern DPS green sturgeon. Genetic analysis of tissue samples collected from observed green sturgeon bycatch in coastal waters adjacent to San Francisco Bay indicated that approximately 17 percent (*i.e.,* 3 out of 18) of the green sturgeon encountered and sampled belonged to the Northern DPS and approximately 83 percent (*i.e.,* 15 out of 18) belonged to the Southern DPS (Israel 2010).

Green sturgeon feed on benthic invertebrates and fish (Adams *et al.* 2002). Radtke (1966) analysed stomach contents of juvenile green sturgeon captured in the Delta and found the majority of their diet was benthic invertebrates such as mysid shrimp and amphipods (*Corophium spp*). Manual tracking of acoustically-tagged green sturgeon in the San Francisco Bay estuary indicates they are generally demersal but make occasional forays to surface waters, perhaps to assist their migration (Kelly *et al*. 2007). Recent telemetry data in coastal ocean habitats suggest that green sturgeon spent a longer duration in areas with high seafloor complexity, especially where a greater proportion of the substrate consists of boulders (Huff *et al*. 2011). However, while presumably feeding on benthic invertebrates in estuaries green sturgeon do not appear to utilize hard substrates (Dumbauld *et al*. 2008). Preliminary data from mapping surveys conducted in Willapa Bay, Washington, showed densities of “feeding pits” (depressions in the substrate believed to be formed when green sturgeon feed) were highest over shallow intertidal mud flats, while harder substrates (*e.g.,* gravel) had no pits (M. Moser, unpublished data). In their natal rivers, telemetry data indicates mature green sturgeon prefer deep pools, presumably for the purposes of spawning and conserving/restoring energy (Erickson and Webb 2007, Heublein *et al*. 2009). Similar tracking studies involving juvenile green sturgeon have not been conducted, and their behavior and habitat preferences in rivers and estuaries are largely unknown.

5. <u>Pacific Eulachon</u>

Eulachon are a smelt native to eastern North Pacific waters. Historically, Pacific eulachon ranged from the Bering Sea to Monterey Bay, California (Hart and McHugh 1944, Eschmeyer *et al.* 1983a, Minckley *et al.* 1986, Hay and McCarter 2000). However, over the past several decades the southern extent of their distribution has receded northward to the Mad River in

northern California. The Southern DPS of Pacific eulachon extends from the Nass River of British Columbia to the Mad River of California.

Eulachon are semelparous and anadromous, spending most of their lives in marine environments before returning to freshwater to spawn once and die. Because larvae exit the freshwater system almost immediately, they likely retain homing only to the estuarine system that their natal streams drain (Hay and McCarter 2000, Beacham *et al.* 2005). Specific spawning rivers within the natal system are likely selected based upon environmental conditions at the time of return (Hay and Beacham 2005).

Adult eulachon have been observed in California's Humboldt Bay, Klamath, Mad, Russian, and Sacramento Rivers as well as Redwood Creek, the Umpqua and Rogue Rivers in Oregon, and Washington's Puget Sound, Hood Canal, Bear, Naselle, Nemah, Wynoochee, Quinault, Queets, and Nooksack Rivers (Odemar 1964, Moyle 2002, Minckley *et al.* 1986, Emmett *et al.* 1991, Jennings 1996, Wright 1999, Larson and Belchik 1998, Musick *et al.* 2000, WDFW and ODFW 2001). Spawning has been documented in the Elwha River and the Strait of Juan de Fuca, but sightings or spawning in these Oregon and Washington rivers is very limited or unknown (Wright 1999, Shaffer *et al.* 2007). For southern DPS eulachon, most spawning is believed to occur in the Columbia River and its tributaries (Grays, Skamokawa, Elochoman, Kalama, Lewis, and Sandy rivers), with less production from the Mad and Klamath Rivers, as well as sporadic production in the other Oregon and Washington rivers (Emmett *et al.* 1991, Musick *et al.* 2000, WDFW and ODFW 2001). Eulachon from southern rivers generally spawn at a younger age than eulachon from more northern rivers (Clarke *et al.* 2007).

Spawn timing depends upon the river system involved (Willson *et al.* 2006). In the Columbia River and farther south, spawning occurs from late January to May, although river entry occurs as early as December (Hay and McCarter 2000). The peak of eulachon runs in Washington State is from February through March. Fraser River spawning is significantly later, in April and May (Hay and McCarter 2000). The populations in the Klamath River, Mad River, Redwood Creek, and Sacramento River are thought to be extirpated or nearly so[10].

The timing of eulachon entry into spawning rivers is likely tied to water temperature and tidal cycles (Ricker *et al.* 1954, WDFW and ODFW 2001, Lewis *et al.* 2002, Spangler 2002). Spawning normally occurs when water temperature is between 39° and 50° Fahrenheit. Adults may migrate up to 100 miles upstream to reach spawning grounds (Hart and McHugh 1944). Males tend to arrive on spawning grounds earlier than females and tend to stay longer, making them more susceptible to commercial and recreational fisheries (Hart and McHugh 1944). However, males outnumber females by a roughly 2:1 margin. Eulachon sperm is viable for only minutes and a key factor of eulachon spawning may be male grouping en mass to broadcast their

[10] http://www.nmfs.noaa.gov/pr/species/fish/pacificeulachon.htm (last visited on September 26, 2013)

sperm. Once milt reaches downstream females, each female releases 7,000 to 31,000 eggs (in the Columbia River) at which time fertilization occurs (WDFW and ODFW 2001). Females lay eggs over sand, course gravel, or detrital substrate. This reproductive strategy requires high eulachon density to ensure fertilization. Eggs attach to gravel or sand and incubate for 30 to 40 days after which larvae drift to estuaries and coastal marine waters (Wydoski and Whitney 1979) and after three to five years, adults migrate back to natal basins to spawn.

Eulachon generally die following spawning (Scott and Crossman 1973, Clarke *et al.*2007). Maximum known lifespan is 9 years of age, but 20 to 30 percent of individuals live to 4 years and most individuals survive to 3 years of age, although spawning has been noted as early as 2 years of age (Wydoski and Whitney 1979, Barrett *et al.*1984, Hugg 1996, Hay and McCarter 2000, WDFW and ODFW 2001). The age distribution of spawners varies between river and from year-to-year (Willson *et al.*2006).

Adult eulachon are found in coastal and offshore marine habitats possibly to 2,000 feet deep, but more frequently between 50 and 600 feet deep (Allen and Smith 1988, Hay and McCarter 2000, Willson *et al.*2006). Following hatching in freshwater, larvae and juveniles become thoroughly mixed in coastal waters generally less than 50 feet deep and move deeper as they grow (Barraclough 1964, Hay and McCarter 2000). Larval and post larval eulachon prey upon phytoplankton, copepods, copepods eggs, mysids, barnacle larvae, worm larvae, and other eulachon larvae until they reach adult size (WDFW and ODFW 2001). During this time, the primary prey of eulachon are copepods and euphausiids, including Thysanoessa *spp*., unidentified malacostracans, and cumaceans (Smith and Saalfeld 1955, Barraclough 1964, Wydoski and Whitney 1979, Drake and Wilson 1991, Studevant *et al.*1999, Hay and McCarter 2000).

B. Status of Species

1. 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, the SONCC coho salmon ESU has 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 likely to become endangered within the foreseeable future (NMFS 2001, Good *et al.* 2005). In 2005 NMFS evaluated the listing status of the SONCC coho salmon ESU and concluded that the SONCC coho salmon ESU continues to warrant listing under the ESA as a threatened species (70 FR 37160, June 28, 2005). 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). 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. In its most recent five-year review, NMFS recommended that the SONCC coho salmon ESU remain listed as a threatened species (NMFS 2011a, 76 FR 50477, August 15, 2011).

2. Status of the CCC coho salmon ESU

Historically, the CCC coho salmon ESU was comprised of approximately 76 coho salmon populations.[11] Most of these were dependent populations that needed immigration from other nearby populations to ensure their long term survival, as described above. Historically, there were 11 functionally independent populations and one potentially independent population of CCC coho salmon (Spence *et al.* 2008). Most of the populations in the CCC coho salmon ESU are currently doing poorly. Low abundance is common, and some populations have been extirpated, as described below. A comprehensive review of estimates of historic abundance, decline, and present abundance of coho salmon in California is provided by Brown *et al*. (1994). They estimated that annual spawning numbers of coho salmon in California ranged between 200,000 and 500,000 fish in the 1940's, which declined to about 100,000 fish by the 1960's, followed by a further decline to about 31,000 fish by 1991. Brown *et al.* (1994) concluded that the abundance of California coho salmon had declined more than 94 percent since the 1940's, with the greatest decline occurring since the 1960's. More recent abundance estimates vary from approximately 600 to 5,500 adults (Good *et al.* 2005). Recent NMFS status reviews (NMFS 2001, NMFS 2003, Good *et al.* 2005, Spence *et al.* 2008) indicate that the CCC coho salmon are likely continuing to decline in number.

CCC coho salmon have also experienced acute range restriction and fragmentation (Brown and Moyle 1991). Adams *et al.* (1999) found that in the mid 1990's coho salmon were present in 51

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

percent (98 of 191) of the streams where they were historically present, and documented an additional 23 streams within the CCC coho salmon ESU in which coho salmon were found for which there were no historical records.

Recent genetic research in progress by both the NMFS Southwest Fisheries Science Center and the Bodega Marine Laboratory has documented a reduction in genetic diversity within subpopulations of the CCC coho salmon ESU (Bjorkstedt *et al.* 2005). The influence of hatchery fish on wild stocks has also contributed to the lack of diversity through outbreeding depression and disease. Available information suggests that CCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative). The CCC coho salmon ESU has experienced range constriction, fragmentation, and a loss genetic diversity.

Many dependent populations that supported the species overall numbers and geographic distributions have been extirpated. This suggests that populations that historically provided support to dependent populations via immigration have not been able to provide enough immigrants for many dependent populations for several decades. The near-term (10 - 20 years) viability of many of the extant independent CCC coho salmon populations (Garcia River, Gualala River, Russian River, and San Lorenzo River) is of serious concern.

Recent information clearly documents CCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative). Many subpopulations that may have acted to support the species' overall numbers and geographic distribution have been lost. The extant subpopulations of CCC coho salmon may not have enough fish to survive additional natural and human caused environmental change. Recent status reviews for CCC coho salmon conclude that this ESU is presently in danger of extinction (NMFS 2001, NMFS 2003, Good *et al.* 2005, Spence and Williams 2011). On June 28, 2005, NMFS issued a final listing determination for the CCC coho salmon ESU, changing their status from threatened to endangered (70 FR 37160). The most recent status review (Spence and Williams 2011) documents conditions for CCC coho salmon have worsened since the last status review in 2005 (Good *et al.* 2005). Poor returns from 2006 to 2010 indicate that adult abundance for the CCC coho salmon ESU has continued to decline to the extent risk of extinction has increased since Good *et al*. concluded CCC coho were in danger of extinction in 2005. In its most recent five-year review, NMFS recommended that the CCC coho salmon ESU remain listed as an endangered species (NMFS 2011c, 76 FR 50477, August 15, 2011).

3. <u>Status of the SRWR Chinook salmon ESU</u>

The Sacramento River winter-run Chinook salmon ESU has been completely displaced from its historical spawning habitat by the construction of Shasta and Keswick dams. Approximately 300 miles of tributary spawning habitat in the upper Sacramento River is now inaccessible to the

ESU. Most components of the Sacramento River winter-run Chinook salmon life history (*e.g.*, spawning, incubation, freshwater rearing) have been compromised by the habitat blockage in the upper Sacramento River. The remaining spawning habitat in the upper Sacramento River is artificially maintained by cool water releases from Shasta and Keswick dams, and the spatial distribution of spawners is largely governed by the water year type and the ability of the Central Valley Project to manage water temperatures in the upper Sacramento River.

Between the time Shasta Dam was built and the Sacramento River winter-run Chinook salmon were listed as endangered, major impacts to the population occurred from warm water releases from Shasta Dam, juvenile and adult passage constraints at the Red Bluff Diversion Dam (RBDD), water exports in the southern Delta, and entrainment at a large number of unscreened or poorly-screened water diversions. The naturally spawning component of this ESU has exhibited marked improvements in abundance and productivity in the 2000s (CDFG 2008a). These increases in abundance are encouraging, relative to the years of critically low abundance of the 1980s and early 1990s; however, returns of several West Coast Chinook salmon and coho salmon stocks were lower than expected in 2007 (MacFarlane *et al.* 2008), and stocks remained low through 2009.

A captive broodstock artificial propagation program for Sacramento River winter-run Chinook salmon has operated since the early 1990s as part of recovery actions for this ESU. As many as 150,000 juvenile salmon have been released by this program, but in most cases the number of fish released was in the tens of thousands (Good *et al.* 2005). NMFS reviewed this hatchery program in 2004 and concluded that as much as 10 percent of the natural spawners may be attributable to the program's support of the population (69 FR 33102, June 14, 2004). The artificial propagation program has contributed to maintaining diversity through careful use of methods that ensure genetic diversity. If improvements in natural production continue, the artificial propagation program may be discontinued (69 FR 33102).

Several actions have been taken to improve habitat conditions and population abundance for Sacramento River winter-run Chinook salmon including changes in ocean and inland fishing harvest that increase ocean survival and adult escapement, and implementation of habitat restoration efforts throughout the Central Valley. However, this population remains below established recovery goals and the naturally-spawned component of the ESU is dependent on one extant population in the Sacramento River. There is particular concern about risks to the ESU's genetic diversity (genetic diversity is probably limited because there is only one remaining population) life-history variability, local adaptation, and spatial structure (Good *et al.* 2005, 70 FR 37160, June 28, 2005). The status of the Sacramento River winter-run Chinook salmon ESU is little changed since the last status review, and new information available since Good *et al.* (2005) does not appear to suggest a change in extinction risk (Williams *et al.* 2011). In its most recent five-year review, NMFS recommended that the Sacramento River winter-run Chinook

salmon ESU remain listed as an endangered species (NMFS 2011e, 76 FR 50447, August 15, 2011).

4. Status of the CVSR Chinook salmon ESU

Although protective measures likely have contributed to recent increases in Central Valley spring-run Chinook salmon abundance, the ESU is still below levels observed from the 1960s through 1990. Threats from hatchery production (*i.e.*, competition for food between naturally-spawned and hatchery fish, run hybridization and genomic homogenization), climatic variation, high water temperatures, predation, and water diversions still persist.

Wild runs of CVSR Chinook salmon persist in a fraction of the streams where they historically occurred (NMFS 2009). These include, the upper reaches of the Sacramento River, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Feather River, Mill Creek, and Yuba River (CDFG 1998). Only the Deer, Mill, and Butte creek populations are considered to be independent populations and these three populations are all within the same diversity strata (NMFS 2009). Because wild CVSR Chinook salmon ESU populations are confined to relatively few remaining watersheds and continue to display broad fluctuations in abundance, the Biological Review Team (BRT) (Good *et al.* 2005) concluded that the ESU is likely to become endangered within the foreseeable future. According to Population Viability Assessment (PVA) models and other population viability criteria, Lindley *et al.* (2007) concluded that the CVSR Chinook salmon populations in Butte and Deer creeks were at a low risk of extinction. The Mill Creek population was classified as being at a moderate risk of extinction based on the PVA model, however, it met the criteria for a low risk of extinction for all other viability criteria.

Data from the 2009 and 2010 adult CVSR Chinook salmon return counts indicate a decline in returning adults across the range of CVSR Chinook salmon within the Central Valley of California. Poor ocean conditions are suspected as the principal short term cause because of the wide geographic range of declines (MacFarlane *et al.* 2008, Lindley *et al.* 2009). Preliminary data from the 2011 adult returns indicate an increase in returning adults across their range (Jeffrey Jahn, personal communication 2012).

Williams *et al.* (2011) conclude that the status of CVSR Chinook salmon ESU has probably deteriorated since the 2005 status review. Improvements, evident in the status of two populations, are certainly not enough to warrant downgrading of the ESU extinction risk. The degradation in status of the three formerly low- or moderate- risk independent populations is cause for concern. New information available since Good *et al.* (2005) indicates an increased extinction risk. In its most recent five-year review, NMFS recommended that this ESU remain listed as a threatened species while also recommending monitoring and reassessment within 2-3

years if a positive trend does not become evident (NMFS 2011b, 76 FR 50447, August 15, 2011).

5. 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). The most recent estimate of ESU-wide CC Chinook salmon abundance is 73,000 fish, predominantly in the Eel River (55,500) with smaller populations in Redwood Creek, Mad River, Mattole River (5,000 each), Russian River (500), and several small streams in Del Norte and Humboldt Counties (Myers *et al*. 1998).

Data available to assess trends in abundance are limited. Nehlsen *et al*. (1991) identified seven CC Chinook salmon stocks at high extinction risk and seven stocks at moderate extinction risk. Higgins *et al*. (1992) provided a more detailed analysis of some of these stocks, and identified nine CC Chinook salmon stocks at risk or of concern. Four of these stock assessments agreed with Nehlsen *et al*. (1991) designations, while five fall-run Chinook salmon stocks were either reassessed from a moderate risk of extinction to stocks of concern (Redwood Creek, Mad River, and Eel River) or were additions to the Nehlsen *et al*. (1991) list as stocks of special concern (Little River and Bear River).

As with previous reviews, the 2005 BRT review concluded the CC Chinook salmon ESU is likely to become endangered in the foreseeable future (Good *et al*. 2005). Widespread declines in abundance and the present distribution of small populations with sometimes sporadic occurrences contribute to the risks faced by the CC Chinook salmon ESU. The BRT was concerned about the paucity of information and resultant uncertainty associated with estimates of abundance, natural productivity, and distribution of Chinook salmon in this ESU (Good *et al*. 2005). As a result, NMFS confirmed the listing of CC Chinook salmon as threatened under the ESA on June 28, 2005 (70 FR 37160).

Data from counts in 2007/08 and 2008/09 show a severe decline in returning adult Chinook salmon along the coast of California and Oregon compared to the same cohort in 2004/05. Ocean conditions are suspected as the principal short term cause because of the wide geographic range of declines (MacFarlane *et al.* 2008; Lindley *et al.* 2009). However, the number of adult CC Chinook salmon returns in watersheds near the study area (*i.e.*, Russian River Watershed) increased substantially in 2010/2011 and 2011/12 compared to 2008/09 and 2009/10 returns.[12]

[12] http://www.scwa.ca.gov/chinook/ (last visited on September 26, 2013)

In the Eel River Watershed, adult CC Chinook salmon returns during the fall-winter of 2012/2013 were the highest observed in since the 1930s. Increases in adult Chinook salmon returns during 2010/2011 have been observed in the Central Valley populations as well.

Williams *et al.* (2011) concluded it is difficult to characterize the status of the CC Chinook salmon ESU based on available data. However, Williams *et al.* (2011) reported the loss of representation from one diversity stratum, the loss of the spring-run history type in two diversity substrata, and the diminished connectivity between populations in the northern and southern half of the ESU poses a concern regarding viability criteria for this ESU. Williams *et al*. (2011) did not find evidence of a substantial change in conditions since the last status review (Good 2005). Based on a consideration of this updated information, Williams *et al.* (2011) concluded the extinction risk of the CC Chinook salmon ESU has not changed since the last status review. In its most recent five-year review, NMFS recommended that the CC Chinook salmon ESU remain listed as a threatened species (NMFS 2011c, 76 FR 50447, August 15, 2011).

6. <u>Status of the NC Steelhead DPS</u>

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, Bjorkstedt *et al.* 2005). Based on the limited data available (*i.e.*, dam counts of portions of stocks in several rivers, limited spawner surveys), 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. DPS-wide 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, June 7, 2000).

Updated status reviews reached the same conclusion, and noted the poor amount of data available, especially for winter run steelhead (NMFS 1997a, Adams 2000, Good *et al*. 2005). Comprehensive geographic distribution information is not available for this DPS, but NC steelhead remain widely distributed (Williams *et al.* 2011). 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, the proportion of hatchery returns compared to wild stocks in recent returns to the Mad and Eel river basins have exposed their respective wild population to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead (Williams *et al.* 2011). 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, June 7, 2000). 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.

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 of most populations 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). In its most recent five-year review, NMFS recommended that the NC steelhead DPS remain listed as a threatened species (76 FR 76386, December 7, 2011).

7. Status of the CCC steelhead DPS

Historically, approximately 70 populations of steelhead existed in the CCC steelhead DPS (Spence *et al.* 2008, Spence *et al.* 2012). Many of these populations (about 37) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (Bjorkstedt *et al.* 2005). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhany *et al*. 2000; Bjorkstedt *et al*. 2005).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960s, including 50,000 fish in the Russian River – the largest population within the DPS (Busby *et al.* 1996). Near the end of the 20th Century, McEwan (2001) estimated the wild run population in the Russian River Watershed was between 1,700-7,000 fish. Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Soquel, and Aptos creeks) of individual run sizes of 500 fish or less (62 FR 43937, August 18, 1997). For more detailed information on trends in CCC steelhead abundance, see: Busby *et al*. 1996, NMFS 1997a, Good *et al.* 2005, and Williams *et al.* 2011.

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

The CCC steelhead DPS has experienced a serious decline in abundance and long-term population trends suggest a negative growth rate. This indicates the DPS may not be viable in the long term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, placing dependent populations at

increased risk of extirpation. However, because CCC steelhead remain present in most streams throughout the DPS, roughly approximating the known historical range, CCC steelhead likely possess a resilience that could slow their decline relative to other salmonid DPSs in worse condition. The 2005 status review concluded that steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Good *et al*. 2005). On January 5, 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834, January 5, 2006).

A more recent viability assessment of CCC steelhead concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and that the limited information available did not indicate that any other CCC steelhead populations could be demonstrated to be viable (Spence *et al.* 2008). Data from the 2008/09 through 2010/2011 adult CCC steelhead returns indicate a decline in returning adults across their range compared to other recent returns (*e.g.*, 2006/2007, 2007/2008) (Jeffrey Jahn, NMFS, personal communication, August 2011). The most recent status update concludes that steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Williams *et al.* 2011), as new and additional information available since the previous status review (Good *et al.* 2005) does not appear to suggest a change in extinction risk. In its most recent five-year review, NMFS recommended that the CCC steelhead DPS remain listed as a threatened species (76 FR 76386, December 7, 2011).

8. <u>Status of the SCCC steelhead DPS</u>

Boughton *et al.* (2007) determined the SCCC steelhead DPS consists of 12 discrete sub-populations which represent localized groups of interbreeding individuals. Steelhead populations are present in most streams in the SCCC DPS, however, these populations are fragmented and unstable (Good *et al.* 2005). Severe habitat degradation and compromised genetic integrity of some populations pose a serious risk to the survival and recovery of the SCCC steelhead DPS (Good *et al.* 2005). None of these sub-populations currently meet the definition of viable and most can be characterized by low population abundance, variable or negative population growth rates, and reduced spatial structure and diversity. The sub-populations in the Pajaro River and Salinas River watersheds are in particularly poor condition (relative to watershed size) and exhibit a greater lack of viability than many of the coastal subpopulations.

Populations of SCCC steelhead throughout the DPS have exhibited a long-term negative trend since the mid-1960s. In the mid-1960s, total spawning populations were estimated at 17,750 individuals (Good *et al.* 2005). Available information shows the SCCC steelhead population continued to decline from the 1970s to the 1990s (Busby *et al.* 1996) and more recent data indicate this trend continues (Good *et al.* 2005). Current SCCC steelhead run-sizes in the five largest systems in the DPS (Pajaro River, Salinas River, Carmel River, Little Sur River, and Big

Sur River) are likely greatly reduced from 4,750 adults in 1965 (CDFG 1965) to less than 500 returning adult fish in 1996. More recent estimates for total run-size do not exist for the SCCC steelhead DPS (Good *et al.* 2005).

In the winters of 2008/09 and 2009/10, adult returns in many streams within the DPS were considerably reduced relative to higher returns at the beginning of the decade. This has been attributed largely to poor ocean conditions along the eastern Pacific Ocean (Lindley *et al.* 2009). During the winter of 2010/11, the number of returning adult steelhead in some populations within the DPS rebounded, including the Carmel River where the total number of returning adults at the San Clemente Dam[13] was similar to recent high returns observed at the beginning of the decade.

On January 5, 2006, NMFS confirmed the listing of SCCC steelhead as threatened under the ESA (71 FR 834). In the most recent status update (Williams *et al.* 2011) NMFS concluded there was no evidence to suggest the status of the SCCC steelhead DPS has changed appreciably since the publication of the previous status review (Good *et al.* 2005) and therefore NMFS recommended in its most recent five-year review that the SCCC steelhead DPS remain listed as a threatened species (76 FR 76386, December 7, 2011).

9. <u>Status of the CV steelhead DPS</u>

Population trend data remain extremely limited for CV steelhead (Williams *et al.* 2011). Historic CV steelhead run sizes are difficult to estimate given the paucity of data, but may have approached one to two million adults annually (McEwan 2001). By the early 1960s the steelhead run size had declined to about 40,000 adults (McEwan 2001). Over the past 30 years, the naturally-spawned steelhead populations in the upper Sacramento River have declined substantially. Hallock *et al.* (1961) estimated an average of 20,540 adult steelhead through the 1960s in the Sacramento River, upstream of the Feather River. Steelhead counts at Red Bluff Diversion Dam (RBDD) declined from an average of 11,187 for the period of 1967 to 1977, to an average of approximately 2,000 through the early 1990s, with an estimated total annual run size for the entire Sacramento-San Joaquin system, based on RBDD counts, to be no more than 10,000 adults (McEwan and Jackson 1996, McEwan 2001). Steelhead escapement surveys at RBDD ended in 1993 due to changes in dam operations.

The best best poplation-level data come from Battle Creek where Coleman National Fish Hatchery (NFH) operates a weir that blocks upstream movement of fish (Williams *et al*. 2011). However, changes in hatchery policies and transfer of fish over the years complicate the interpretation of these data. For example, starting in 2005, Coleman NFH stopped transferring all adipose fin clipped (hatchery-origin) steelhead above the weir resulting in a large decrease in

[13] http://www.mpwmd.dst.ca.us/fishcounter/fishcounter.htm (last visited on September 26, 2013)

the overall numbers of fish passing the weir in subsequent years. As a result, the only unbiased time series for Battle Creek is the number of unclipped (wild) steelhead returning since 2001. These data show a slight decline over the last ten years mostly because of the high returns observed in 2002 and 2003. Williams *et al.* (2011) indicate the Battle Creek population declined significantly since the early 2000s, but their analysis did not take into account the fact that hatchery fish were not transferred above the barrier weir after 2005. Prior to halting the transfer of adipose fin-clipped steelhead above the weir in 2005, the majority of fish transferred were of hatchery origin in the early 2000s.

Steelhead returns to Coleman NFH have varied considerably over the past five years. Since 2003, adults returning to the hatchery have been classified as wild (unclipped) or hatchery produced (adipose fin-clipped). Wild adults counted at the hatchery each year represent a small fraction of overall returns, but their numbers have remained relatively stable in the range of 200-300 fish each year. Numbers of hatchery-origin fish have fluctuated much more however, ranging from 624 to 2,968 fish.

Steelhead redd counts are made in Clear Creek and the American River, but the data are currently insufficient to compute population metrics (Williams *et al.* 2011). An average of 151 steelhead redds have been counted annually in Clear Creek from 2001 to 2010 and the total number of observed redds has steadily increased since Saeltzer Dam was removed in 2000. The vast majority of steelhead in Clear Creek are likely of natural origin since hatchery fish are not stocked there and no hatchery origin fish were found during monitoring through at least 2008.

In the American River an average of 154 redds were counted annually between 2002-2010 and the available data suggest a declining trend (Hannon and Deason 2008). The East Bay Municipal Utilities District (EBMUD) has included steelhead in their redd surveys on the lower Mokelumne River since the 1999-2000 spawning season. Based on data from these surveys, the overall trend suggests that redd numbers have slightly increased over the years. According to Satterthwaite *et al.* (2010), it is likely that most of the *O. mykiss* spawning in the Mokelumne River are non-anadromous (or resident) fish rather than steelhead.

Steelhead returns to the Feather River Hatchery have decreased substantially in the last several years with only 679 in 2008, 312 in 2009 and 86 in 2010. Because almost all of the returning fish are of hatchery origin and stocking levels have remained fairly constant over the years, the data suggest that adverse freshwater and/or ocean survival conditions have caused or at least contributed to these declining hatchery returns. The Central Valley experienced three consecutive years of drought (2007-2009) which would likely have impacted parr and smolt growth and survival. Poor conditions are known to have occurred in at least 2005 and 2006 which impacted Chinook populations in the Central Valley and may well have also impacted steelhead populations. Preliminary return data for 2011 from CDFW suggest a strong rebound in

return numbers for 2011, with 712 adults returning to the hatchery through April 5. Based on steelhead returns to the hatcheries and the redd counts on Clear Creek, the American River, and the Mokelumne River, it appears wild fish may not have been impacted by poor freshwater and marine rearing conditions as much as hatchery-origin fish over the last several years. This may reflect greater fitness of naturally-produced steelhead relative to hatchery fish, and certainly merits further study.

The Chipps Island midwater trawl dataset from the United States Fish and Wildlife Service (USFWS) provides information on the trend in the overall abundance of the CV steelhead DPS (Williams *et al.* 2011). Updated through 2010, the trawl data indicate that the apparent decline in natural production of steelhead has continued since the 2005 status review. Catch per-unit-effort has fluctuated over the past decade, but the proportion of the catch that is adipose-clipped (100 percent of all hatchery produced steelhead have been adipose fin clipped since 1998) has steadily increased, exceeding 90 percent in recent years and reaching 95 percent in 2010 (Williams *et al.* 2011). Because hatchery releases have been fairly constant over the years, these data suggest that natural production of steelhead has been declining. Steelhead salvage counts from fish collection facilities at the Federal and State pumping plants in the southern Delta have fluctuated dramatically since 1993. In most years since 1998 (the year 100 percent mark of all hatchery steelhead began), the majority of salvaged steelhead have been of hatchery origin (USBOR 2008).

Until recently, CV steelhead were thought to be extirpated from the San Joaquin River system. Recent monitoring has detected small self-sustaining populations of steelhead in the Stanislaus, Mokelumne, and Calaveras rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001). On the Stanislaus river, steelhead smolts have been captured in rotary screw traps at Caswell State Park and Oakdale each year since 1995 (Demko *et al.* 2000, Demko *et al.* 2001, Watry et al. 2008). It is possible that naturally-spawning populations exist in many other streams but are undetected due to lack of monitoring programs (IEP Steelhead Project Work Team 1999). Incidental catches and observations of steelhead juveniles also have occurred on the Tuolumne and Merced rivers during fall-run Chinook salmon monitoring activities, indicating that steelhead are widespread throughout accessible streams and rivers in the CV (Good *et al.* 2005). CDFW staff has prepared juvenile migrant CV steelhead catch summaries from the San Joaquin River near Mossdale representing migrants from the Stanislaus, Tuolumne, and Merced rivers. Based on trawl recoveries at Mossdale between 1988 and 2002, as well as rotary screw trap efforts in all three tributaries, CDFW staff stated that it is “clear from this data that rainbow trout do occur in all the tributaries as migrants and that the vast majority of them occur on the Stanislaus River” (Letter from Dean Marston, CDFW, to Madelyn Martinez, NMFS, January 9, 2003). The documented returns on the order of single fish in these tributaries suggest that existing populations of CV steelhead on the Tuolumne, Merced, and lower San Joaquin rivers are severely depressed.

Williams *et al.* 2011 have concluded the status of the CV steelhead DPS has worsened since the 2005 status review (Good *et al.* 2005), when the BRT concluded the DPS was in danger of extinction. In its most recent five-year review, NMFS recommended that this DPS remain listed as a threatened species while also recommending monitoring and reassessment within 2-3 years if a positive trend does not become evident (NMFS 2011d, 76 FR 50447, August 15, 2011).

10. Status of the southern DPS of North American green sturgeon

To date, little population-level data have been collected for green sturgeon. In particular, there are no published abundance estimates for either Northern DPS or Southern DPS green sturgeon in any of the natal rivers based on survey data (Israel *et al*. in prep). As a result, efforts to estimate green sturgeon population size have had to rely on sub-optimal data with known potential biases, including monitoring designed for white sturgeon (*Acipenser transmontanus*) populations, harvest time series, or entrainment from water diversion and export facilities (Adams *et al*. 2007). Of these sources, only the water diversion data indicate a possible trend, suggesting Southern DPS green sturgeon abundance or recruitment has declined since 1986 in the Sacramento River (Adams *et al*. 2007).

More recent genetic techniques and monitoring surveys are beginning to clarify questions about green sturgeon population size. Genetic data collected from incidental captured larval green sturgeon in salmon out-migrant traps suggest that the number of adult green sturgeon in the upper Sacramento River (Southern DPS green sturgeon) remained roughly constant between 2002 and 2006 in river reaches above Red Bluff (Israel and May 2010). Recently developed surveys using dual-frequency identification sonar (DIDSON) have estimated 175 to 250 sturgeon (±50) in the mainstem Sacramento River during the spawning season in 2010 and 2011 (personal communication with Ethan Mora, UC Davis, on January 10, 2012). However, this estimate includes considerable uncertainty; all sturgeon detections were assumed to be green sturgeon and a small number of white sturgeon were potentially misidentified as green sturgeon. Furthermore, spawning population estimates assumed individual fish did not move in and out of survey areas throughout the season (*i.e.*, observations of multiple individuals moving in and out of an area could be recorded as one individual). Given these uncertainties, caution must be taken in using these estimates to infer the spawning run size for the Sacramento River, until further analyses are completed.

Recruitment data for Southern DPS green sturgeon are essentially nonexistent. Incidental catches of larval green sturgeon in the mainstem Sacramento River and of juvenile green sturgeon at the state and Federal pumping facilities in the South Delta suggest that green sturgeon are successful at spawning, but that annual year class strength may be highly variable (Beamesderfer *et al*. 2007, Adams *et al*. 2007). Successful recruitment into the population is unclear. Because green sturgeon are long-lived and spawn multiple times throughout their lifetime, spawning failure in one year can be made up for in another spawning year. In general,

sturgeon year class strength appears to be episodic with overall abundance dependent on a few successful spawning events (NMFS 2010).

Recently, Erickson *et al*. (unpublished) estimated spawning run sizes for Northern DPS rivers ranging from 426 to 734 adult green sturgeon using mark-recapture methods (Israel *et al*. in prep). These estimates appear to be inconsistent with harvest data indicating that 200 to 450 Northern DPS green sturgeon were harvested each year in the Klamath River tribal fishery from 1985 to 2003, with no evidence of declining catches (Adams *et al*. 2007). The inconsistencies may be due to error in the population estimates and/or because the recent population estimates were based on data collected from a different time period compared to the tribal harvest data. Adams *et al*. (2007) concluded the abundance of mature green sturgeon in the Southern DPS is much smaller than in the Northern DPS (Adams *et al*. 2007), but the absolute and relative abundance of the two DPSs remain highly uncertain. Carefully designed studies remain needed to provide absolute estimates of abundance for the species.

Recently enacted fishing regulations and conservation measures have reduced current fishery impacts to green sturgeon throughout its range.[14] For example, commercial and sport fisheries in California, Oregon, Washington (United States), and British Columbia (Canada) now ban retention of green sturgeon.

Green sturgeon face a variety of threats in the freshwater, estuarine, and marine environments within which they move throughout their life history. Threats to this species include: reduction/loss of spawning areas, insufficient freshwater flow rates in spawning areas, contaminants (*e.g.*, pesticides), harvest bycatch, poaching, entrainment by water projects, influence of exotic species, small population size, impassable barriers, and elevated water temperatures (Adams *et al*. 2007). The most recent status review update concluded the Southern DPS green sturgeon is likely to become endangered in the foreseeable future (NMFS 2005a). A principal factor in NMFS' conclusion was the reduction of potential spawning habitat to a single area in the Sacramento River due to migration barriers (*e.g.*, dams). Historical spawning habitat may have extended up into the three major branches of the upper Sacramento River above the current location of Shasta Dam; however, those habitats have been made inaccessible or altered by dams (Mora *et al*. 2009, Adams *et al*. 2007). The reduction of spawning habitat to a single system increases the vulnerability of the spawning population to catastrophic events and of early life stages to variable environmental conditions within the system. Severe threats to the single remaining spawning population, coupled with the inability to alleviate those threats using current conservation measures, led to the decision to list the species as threatened on April 7, 2006 (71 FR 17757).

[14] http://www.nmfs.noaa.gov/pr/species/fish/greensturgeon.htm (last visited on September 26, 2013)

11. Status of the Southern DPS of Pacific eulachon

The Southern DPS of Pacific eulachon was listed as threatened on March 18, 2010 (75 FR 13012). This species is threatened by decreased abundance, natural predation, commercial and recreational fishing pressure (directed and bycatch), and loss of habitat (NMFS 2008, Gustafson *et al.* 2010). Population decline is anticipated as a result of climate change and bycatch in commercial shrimp fisheries. However, eulachon are highly fecund and have the ability to rebound quickly if given the opportunity, a feature that is likely necessary to withstand significant predation pressure and high mortality likely experienced by pelagic larvae (Bailey and Houde 1989, NMFS 2008, Gustafson *et al.* 2010).

Eulachon formerly experienced widespread, abundant runs and have been a staple of Native American diets for centuries along the northwest coast. However, such runs that were formerly present in several California rivers as late as the 1960s and 1970s (*i.e.*, Klamath River, Mad River, and Redwood Creek) are thought to no longer occur (Larson and Belchik 1998, Moyle 2002, Gustafson *et al.* 2010). Eulachon have not been observed in the Mad River or Redwood Creek since the mid-1990s, although the sampling efforts within these watersheds have been low or non-existent (Moyle 2002).

C. Status of Critical Habitat

In designating critical habitat, NMFS considers, among other things, the following requirements of the species: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing offspring; and, generally; and (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on PCEs, principal biological or physical constituent elements within the defined area that are essential to the conservation of the species.

1. Status of Critical Habitat for ESA-listed Salmonids

Designated critical habitat for Chinook salmon and steelhead overlap the action area including both freshwater and estuarine habitats. In designating critical habitat for Chinook salmon and steelhead, NMFS focused on areas that are important for the species' overall conservation by protecting quality growth, reproduction, and feeding. The critical habitat designation for these species identifies the known primary constituent elements (PCEs) that are necessary to support one or more steelhead or Chinook salmon life stages, including: (1) freshwater spawning, (2) freshwater rearing, (3) freshwater migration, (4) estuarine areas, (5) nearshore marine areas, and (6) offshore marine areas. Within the PCEs, essential elements of SRWR and CC Chinook salmon ESU and NC, CCC, and SCCC steelhead DPS critical habitats include adequate (1)

substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, (10) safe passage conditions, and (11) salinity conditions (70 FR 52488, September 2, 2005).

Designated critical habitat for coho salmon overlap the action area including both freshwater and estuarine habitats. In designating critical habitat for coho salmon, NMFS focused on the known physical and biological features within the designated area that are essential to the conservation of the species. These essential features may include, but are not limited to, spawning sites, food resources, water quality and quantity, and riparian vegetation. Within the essential habitat types (spawning, rearing, migration corridors), essential features of coho salmon critical habitat include adequate (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions (64 FR 24049, May 5, 1999).

The essential habitat types of designated critical habitat for coho salmon and PCEs of designated critical habitat for steelhead and Chinook salmon are those accessible freshwater habitat areas that support spawning, incubation and rearing, migratory corridors free of obstruction or excessive predation, and estuarine areas with good water quality and that are free of excessive predation. Timber harvest and associated activities, road construction, urbanization and increased impervious surfaces, migration barriers, water diversions, and large dams throughout a large portion of the freshwater range of the ESUs and DPSs continue to result in habitat degradation, reduction of spawning and rearing habitats, and reduction of stream flows. The result of these continuing land management practices in many locations has limited reproductive success, reduced rearing habitat quality and quantity, and caused migration barriers to both juveniles and adults. These factors limit the conservation value (*i.e.*, limiting the numbers of salmonids that can be supported) of designated critical habitat within freshwater habitats at the ESU or DPS scale.

The condition of critical habitat for ESA-listed salmonids, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable populations. NMFS has determined that present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat[15]: logging, agricultural and mining activities, urbanization, stream/river channelization, dams, hydroelectric power generation, wetland loss, and water withdrawals, including unscreened diversions for irrigation. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels, loss of large woody debris, degradation of water quality,

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

removal of riparian vegetation resulting in increased stream bank erosion, increases in erosion and sedimentation in streams from upland areas, loss of shade (higher water temperatures) and loss of nutrient inputs (Busby *et al.* 1996, Adams *et al.* 2002, Good *et al.* 2005, Spence *et al.* 2008, Williams *et al.* 2011, 70 FR 52488). Water development has drastically altered natural hydrologic cycles in many of the streams and rivers within the covered ESUs and DPSs. Alteration of flows results in migration delays, loss of suitable habitat due to dewatering and blockage; stranding of fish from rapid flow fluctuations; entrainment of juveniles into poorly screened or unscreened diversions, and increased water temperatures harmful to salmonids.

2. Status of Critical Habitat for the southern DPS of green sturgeon

Designated critical habitat for the southern DPS of green sturgeon overlaps the action area including estuarine habitats found in Humboldt, San Francisco, San Pablo Bay, and Suisun bays, and the tidally influenced portions of streams draining to these bays. In designating critical habitat for the southern DPS of green sturgeon, NMFS focused on the known physical and biological features within the designated area that are essential to the conservation of the species. PCEs for green sturgeon have been designated for freshwater riverine systems, estuarine habitats, and nearshore coastal areas (not included in the action area). The specific PCEs essential for the conservation of the Southern DPS of green sturgeon in freshwater riverine habitats include: (1) food resources, (2) substrate type and size, (3) water flow, (4) water quality, (5) migratory corridor, (6) water depth, and (7) sediment quality. The specific PCEs essential for the conservation of the Southern DPS in estuarine habitats include: (1) food resources, (2) water flow, (3) water quality, (4) migratory corridor, (5) water depth, and (6) sediment quality (74 FR 52300, October 9, 2009).

The condition of critical habitat for the southern DPS of green sturgeon, specifically its ability to provide for its conservation, has been degraded from conditions known to support viable populations. NMFS has determined that present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat: stream flow management, dams and diversions, agricultural, timber, and mining activities (both past and present), urbanization, river channelization, and the loss or alteration of wetland habitats. Impacts of concern include alteration of river bank and channel morphology, alteration of water temperatures, loss of historic spawning and rearing habitat, fragmentation of freshwater and estuarine habitats, loss of downstream recruitment of spawning gravels, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, and increases in erosion and sedimentation in streams from upland areas (Adams *et al.* 2002, NMFS 2005a, 71 FR 17757, 74 FR 52300). In particular, substantial water resource development throughout California's Central Valley has altered the natural hydrologic cycles of these rivers, which in turn, has had profound ecological consequences on the health and productivity of the Sacramento-San Joaquin River Delta, San Francisco Bay, and the species that rely on these habitats, including the southern DPS of green sturgeon.

3. Status of Critical Habitat for the southern DPS Pacific eulachon

Designated critical habitat for southern DPS of Pacific eulachon overlaps the action area including freshwater and estuarine habitats specifically in the Klamath River, Redwood Creek, and the Mad River of northern California. The physical or biological features essential to the conservation of the southern DPS of Pacific eulachon fall into three major categories reflecting key life history phases: (1) freshwater spawning and incubation sites, (2) freshwater and estuarine migration corridors, and (3) nearshore and offshore marine foraging habitat (not included in the action area). The components of the freshwater spawning and incubation sites include: (1) flow regime, (2) water quality, (3) water temperature, and (4) substrate. The components of the freshwater and estuarine migration corridor essential feature include: (1) migratory corridor, (2) flow regime, (3) water quality, (4) water temperature, and (5) food resources (76 FR 65324).

The condition of critical habitat for the southern DPS of Pacific eulachon, specifically its conservation value for the DPS, has been degraded from conditions known to support viable populations. NMFS has determined that present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat: stream flow management, dams and diversions, and both past and present dredging activities (Larson and Belchik 1998, Moody 2008, NMFS 2008, Gustafson *et al.* 2010, 75 FR 13012, 76 FR 65324).

Although restoration activities have improved critical habitat conditions in some areas, particularly in upstream freshwater, reduced habitat complexity, poor water quality, and reduced habitat availability continues to persist in many locations due to past and present land use and management practices, and therefore the current condition of critical habitat for the ESA-listed fish species described above remains degraded, and currently does not provide the full extent of conservation value necessary for their recovery.

D. Factors Responsible for Stock Declines

NMFS has identified many reasons (primarily anthropogenic) for the decline of the above listed species (Busby *et al.* 1996, Adams *et al.* 2002, Good *et al.* 2005, NMFS 2005a, Moody 2008, NMFS 2008, Spence and Williams 2011, Williams *et al.* 2011, 75 FR 13012, 76 FR 65324). The foremost reason for the decline in these anadromous populations is the degradation and/or destruction of freshwater and estuarine habitat, including critical habitat, caused by (as described briefly above) anthropogenic disturbances such as urban development, agriculture, logging, water resource development, dams, and the past and ongoing dredging of coastal marine habitats, estuaries, and rivers they inhabit. Additional factors contributing to the decline of salmonid, green sturgeon and Pacific eulachon populations are: poor estuary/lagoon management (Smith 1990), commercial and recreational harvest (Gustafson *et al.* 2010, NMFS 2012c), artificial propagation (Waples 1991, NMFS 2005a, Williams *et al.* 2011), natural stochastic events,

marine mammal predation (NMFS 1997b, Wright *et al.* 2007), reduced marine-derived nutrient transport (Bilby *et al.* 1996, Bilby *et al.* 1998, Gresh *et al.* 2000, Moore *et al.* 2011), and more recently poor ocean conditions (Lindley *et al.* 2009, Gustafson *et al.* 2010).

E. Additional Threats to Species and Critical Habitat

Global climate change presents an additional potential threat to coastal salmonid ESUs/DPSs, green sturgeon, and Pacific eulachon and their critical habitats. Modeling of projected climate change impacts in California suggests that 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 may 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 forests and increases in grasslands and mixed evergreen forests. The likely change in amount of rainfall in Northern and Central Coastal streams under various warming scenarios is less certain, although as noted above, total rainfall across the state is expected to decline. For the California North Coast, some models show large increases (75 to 200 percent) in rainfall amounts while other models show decreases of 15 to 30 percent (Hayhoe *et al*. 2004). Many of these changes are likely to further degrade habitat of these listed species by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids, green sturgeon, and Pacific eulachon. 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, green sturgeon, and Pacific eulachon 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). The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007, Smith *et al.* 2007).

V. ENVIRONMENTAL BASELINE

This environmental baseline section provides an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat (including designated critical habitat), and ecosystem in the action area. 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 includes all coastal anadromous California streams from the Oregon/California border south to the San Mateo/Santa Cruz County boundary, all tributaries draining into San Francisco and San Pablo bays, tributaries to the Sacramento-San Joaquin Delta in eastern Contra Costa, Alameda, and Solano Counites, and a small portion of the upper Pajaro River watershed located in southern Santa Clara County (Figure 1). The action area encompasses a range of environmental conditions, and includes all or part of two endangered salmon ESUs, three threatened salmon ESUs, four threatened steelhead DPSs, one threatened green sturgeon DPS, and one threatened Pacific eulachon DPS. Only a small portion of the SCCC steelhead DPS overlaps with the action area (*i.e.,* Upper Pajaro River tributaries).

The climate in the action area generally falls into two types: coastal and valley climates. The action area in the central and northern California Coast has a Mediterranean climate characterized by cool wet winters with typically high runoff, and dry warm summers characterized by greatly reduced instream flows. Fog is a dominant climatic feature along the coast, generally occurring daily in the summer and not infrequently throughout the rest of the year. Higher elevations and inland areas tend to be relatively fog free. Most precipitation falls during the winter and early spring as rain, with occasional snow above 1,600 feet. This portion of the action area receives one of the highest annual amounts of rainfall in California, with a few areas averaging over 85 inches a year. Mean rainfall amounts range from 9 to 125 inches, and in general, precipitation totals are typically less farther south. Extreme rain events do occur, with over 240 inches being recorded over parts of the action area during 1982-83. Along the coast, average air temperatures range from 46 to 56 °F. Further inland and in the southern part of the action area, annual air temperatures are much more varied, ranging from below freezing in winter to over 100 °F during the summer months.

High seasonal rainfall on bedrock and other geologic units with relatively low permeability, erodible soils, and steep slopes contribute to the flashy nature (stream flows rise and fall quickly) of the watersheds within the action area in the northern and central California coast. In addition, these high natural runoff rates have been increased by extensive road systems and other land uses. High seasonal rainfall combined with rapid runoff rates on unstable soils delivers large amounts of sediment to river systems. As a result, many river systems within this portion of the action area contain a relatively large sediment load, typically deposited throughout the lower gradient reaches of these systems. In the southern half of the action area, it is not uncommon for many streams without augmented stream flow to go intermittent during summer, particularly in dry years.

Native vegetation varies from redwood (*Sequoia sempervirens*) forest along the lower drainages to Douglas fir (*Pseudotsuga menziesii*) intermixed with hardwoods and chaparral, to ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus jefferyi*) stands along the upper elevations. Areas of grasslands are also found along the main ridge tops and south facing slopes of the watersheds.

In the North Coast region, forestry is the dominant land-use throughout the area with smaller amounts of agriculture, mining, and urban developments. Urban development within the North Coast region is found primarily on the estuaries of the larger streams, though there are some small towns and rural residences scattered throughout the area. Dams in the Klamath, Shasta, Trinity, Eel, and Russian rivers regulate stream flow and block access to considerable amounts of historic spawning and rearing habitat.

Urban development and agriculture are the dominant land uses in the San Francisco Bay region. Extensive areas of freshwater and estuarine habitat have been coverted or highly degraded due to these developments. Numerous smaller dams and reservoirs are found throughout the region that impact remaining habitats and also block historic spawning and rearing habitat for salmonid species.

In the Central Coast region, agriculture and urban development are the dominant land uses. Similar to the San Francisco Bay region, extensive areas of historic spawning and rearing habitat have been lost or highly degraded due to these land uses or practices and small dams and water diversions continue to impact the remaining available habitats.

A. Status of the Species and Critical Habitat in the Action Area

The action area includes all or portions of the ESUs and DPSs identified above. Because of the large action area and the overlap with all or portions of the ESUs and DPSs identified above, the status of each individual ESU or DPS within the action area is provided above in section *IV.B. Status of the Species* and will not be repeated in this section, and the status of critical habitat in the action area is provided above in section *IV.C. Status of Critical Habitat* and will not be repeated in this section. Factors affecting the status of the species and critical habitat in the action area are provided above in *IV.D. Factors Responsible for Stock Declines* and will not be repeated in this section as those factors relate to the Environmental Baseline.

A more detailed description of status and trends can be found in the following documents: Weitkamp *et al*. (1995), Busby *et al*. (1996), NMFS (1996), Myers *et al*. (1998), NMFS (1998), Adams *et al.* (2002), CDFG (2002), Good *et al.* (2005), NMFS (2005a), Moody (2008), NMFS (2008), Gustafson *et al.* (2010), Spence and Williams (2011), Williams *et al.* (2011), and 75 FR 13012.

B. Previous Section 7 Consultations in the Action Area

Since the first listing by NMFS of a species under the ESA within the Program action area (SRWR Chinook salmon ESU in 1989 - 54 FR 32085, August 4, 1989), NMFS has conducted more than 1,500 individual section 7 consultations throughout the action area. Of these consultations, a vast majority (likely more than 80 percent) resulted in NMFS' concurrence that the proposed project was not likely to adversely affect ESA-listed species or their designated critical habitats and would instead result in discountable and insignificant impacts to species and critical habitats.

For those consultations where the proposed actions were likely to adversely affect ESA-listed fish species or their designated critical habitat, NMFS produced biological opinions which contained reasonable and prudent measures to minimize the impacts of incidental take of listed species. Many of these projects resulted in improved habitat conditions and improved our understanding of the species status, trends and behaviors (*i.e.,* projects involving habitat restoration, fish passage enhancement or scientific research). A few consultations on proposed actions (less than five) resulted in a jeopardy determination by NMFS. Proposed actions receiving a jeopardy determination are implementing reasonable and prudent alternatives to ensure the continued conservation of listed species and their designated critical habitats.

VI. EFFECTS OF THE PROPOSED ACTION

The purpose of this section is to identify the direct and indirect effects of the proposed action, and the effects of any interrelated or interdependent activities, on endangered and threatened ESA-listed fish species. Our approach was based on knowledge and review of the ecological literature and other relevant materials. We used this information 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 ESA-listed fish species to these stressors in terms of changes to 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. Where data to quantitatively determine the effects of the proposed action on ESA-listed fish species and their critical habitat were limited or not available our assessment of effects focused mostly on qualitative identification of likely stressors and responses.

As described above, Category 1 and Category 2 projects are aligned with projects included in NMFS’ concurrence letter issued to Caltrans and the Corps for Caltrans’ Routine Maintenance,

Small Project, and Repair Program in August 2012 (NMFS 2012a). In this letter, NMFS concurred with Caltrans and the Corps' determination that these projects were not likely to adversely affect listed species or critical habitat. This biological opinion incorporates the analysis of effects and conclusions of NMFS' concurrence letter by reference, and the concurrence letter is included as an attachment to this biological opinion. Therefore, the following section analyzes the effects of Category 3 projects on listed species and critical habitat. The total number of projects and the location of individual projects within each Caltrans District area included in the Program annually will vary from year to year depending on various factors including, but not limited to, funding and scheduling. Based on the types of projects proposed under the Program and NMFS' familiarity with the implementation and outcomes of these types of projects and or activities, NMFS anticipates impacts to ESA-listed species and their designated critical habitat may result from the following: 1) fish capture and relocation, 2) dewatering, 3) increased mobilization of sediment, 4) vegetation removal, and 5) exposure to toxic chemicals. The specific timing and duration of each individual activity will vary depending on the project type, specific project methods, and site conditions. However, the duration and magnitude of direct effects to listed species and to critical habitat associated with implementation of actions will be significantly minimized due to the multiple minimization measures and BMPs that will be utilized during implementation as described above in the *Description of the Proposed Action* section and below. For the activities listed above, if impacts are likely to adversely affect listed species they will be relocated or excluded from the area of impact. Therefore, NMFS has determined that fish capture and relocation is the only Program activity likely to adversely affect listed species (described in detail below).

In the *Compendium of Pile Driving Sound Data* (Illingworth & Rodkin 2012), the most recent pile driving case studies are compiled in order to provide information regarding the underwater sound pressure levels generated by various installation methods and pile types. NMFS, along with the Fisheries Hydroacoustic Working Group (FHWG), uses a dual metric threshold criteria to correlate physical injury to fish exposed to underwater sound produced during pile driving with impact hammers. Specifically, this includes a single strike peak sound pressure level (SPL) of 206 dB (re: 1μPa) and a cumulative sound exposure level (cSEL) of 187 dB (re: 1 $\mu Pa^2 sec$) for fish 2 grams or greater, or 183 dB (re: 1 $\mu Pa^2 sec$) for fish less than 2 grams. If either threshold is exceeded, then physical injury is assumed to occur. All pile driving case studies which exceeded NMFS dual metric threshold criteria for physical injury to fish involved substantially larger piles and installation equipment than what will be necessary for geotechnical drilling in the Program (Illingworth & Rodkin 2012). Therefore, underwater noise generated by geotechnical drilling activities (*i.e.,* driving drill casings and samplers) is expected to be well below levels that are considered harmful to listed fish.

The species (SONCC and CCC coho salmon ESUs; CC, SRWR, and CVSR Chinook salmon ESUs; NC, CCC, SCCC and CV steelhead DPSs; the Southern DPS of North American green

sturgeon; and the Southern DPS of Pacific Eulachon), and designated critical habitat that may be present and/or affected will vary depending on the location of each individual activity. For example, some sites may occur in rivers and streams that have multiple species of salmonids (*e.g.,* Chinook salmon, coho salmon, and steelhead), while other sites may be located in streams where only steelhead are present. Only a small number of streams within the SCCC steelhead DPS (*i.e.,* Upper Pajaro River tributaries within Santa Clara County) are included in the action area, and therefore, a majority of the steelhead within the SCCC DPS and their designated critical habitat will not be affected by the proposed activities.

Within the action area, listed Central Valley salmonids, green sturgeon, and Pacific eulachon are rarely if ever encountered during routine infrastructure projects that involve dewatering and fish relocation. Dewatering and fish relocation activities will primarily occur in freshwater habitats. The extent of freshwater habitat for CV steelhead present in the Program action area is limited to a small number of streams in eastern Solano and Contra Costa counties. In recent years, the presence of CV steelhead in these streams is unknown, but considered unlikely due to substantial habitat modifications. The freshwater habitats in these areas are not within the known distribution of SRWR or CVSR Chinook salmon or green sturgeon. Considering the Program work window (June 15 to October 15, as described in the *Description of the Proposed Action* section) and the poor quality of available freshwater rearing habitat during this period (*i.e.,* dry or unsuitable water quality conditions) at Caltrans maintained infrastructure on these streams, NMFS does not anticipate Central Valley salmonids or green sturgeon will be present during dewatering and fish relocation activities, and therefore these species are not likely to be adversely affected. Furthermore, none of the freshwater habitats in the region described above are designated critical habitat for Central Valley salmonids or green sturgeon.

Dewatering and fish relocation activities in open, tidal habitats of San Francisco Bay and the Delta are rare and primarily involve dewatering of small areas (such as the area around a bridge pier) for bridge or culvert replacement or repair. NMFS is not aware of any recent encounter of listed Central Valley species occurring during dewatering associated with these small-scale infrastructure related projects. Furthermore, dewatering along the shoreline for actions such as bank stabilization can be implemented using methods that would preclude the need for fish capture and relocation (*i.e.,* gradual placement of gravel pads and exclusionary screens). Therefore, potential affects to ESA-listed Central Valley salmonid species and green sturgeon from Program actions occurring in the tidal habitats of San Francisco Bay and the Delta will be limited to the temporary and localized impacts associated with elevated turbidity and vegetation removal along the shoreline. The effects of these activities are described below.

Based on the above information, impacts of dewatering and fish relocation projects during the summer low-flow period will be limited to rearing juvenile SONCC and CCC coho salmon, CC Chinook salmon, and NC, CCC, and SCCC steelhead. We anticipate that a relatively small

number of juvenile salmon and/or steelhead may be present at each individual project work site (described in detail below), and, as described above in Section II.B.1.f, no more than 30 projects involving relocation of ESA-listed fish will be authorized each year under this Program (*i.e.*, 10 projects per Caltrans District annually).

A. Dewatering, Fish Capture and Relocation

1. Fish Capture and Relocation

Maintenance projects in stream channels with perennial flows, or stream channels with water present during project implementation, will include fish relocation activities prior to dewatering the project work site. Depending on the scope of the project, the following Site-Specific Projects could require fish relocation activities (PA-28: Capture, handle, exclude, salvage, and relocate listed species):

- Site-Specific Project-1.3: Stabilization of stream banks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts;
- Site-Specific Project-3.1: Cleaning of drainage channels and ditches to maintain function and avoid damage to adjacent roads;
- Site-Specific Project-3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions;
- Site-Specific Project-3.3: Rehabilitation of culverts to maintain function;
- Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where practicable, improve flow conditions to support fish passage and sediment transport;
- Site-Specific Project-4.1: Repair of bridges to maintain function;
- Site-Specific Project-4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (*e.g.*, earthquake standards); and
- Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where practicable, improve flow conditions for fish passage and sediment transport.

As described above, up to 10 projects involving PA-28 (capture, handle, exclude, salvage, and relocate listed species) will occur annually per District for a maximum of 30 projects per year.

Qualified biologists will capture fish (and amphibians) and relocate them outside of the project work site to avoid direct mortality and minimize the exposure of listed species to construction impacts. Fish in the immediate project area will be captured by seine, dip net and/or by electrofishing, and will then be transported and released to a suitable instream location. Effects associated with fish relocation activities will be minimized due to the multiple minimization

measures that will be utilized because Caltrans will use the measures described in the *California Salmonid Stream Habitat and Restoration Manual Part IX: Measures to Minimize Injury and Mortality of Fish and Amphibian Species During Dewatering* (Flosi *et al.* 2004) and *NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act, June 2000* (NMFS 2000).

2. Dewatering

Depending on site conditions and the scope of the project, the following Site-Specific Projects could require dewatering (PA-17: Install temporary cofferdams and diversion cofferdams; and PA-18: Temporarily redirect stream flow):

- Site-Specific Project-1.3: Stabilization of stream banks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts;
- Site-Specific Project-3.1: Cleaning of drainage channels and ditches to maintain function and avoid damage to adjacent roads;
- Site-Specific Project-3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions;
- Site-Specific Project-3.3: Rehabilitation of culverts to maintain function;
- Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where practicable, improve flow conditions to support fish passage and sediment transport;
- Site-Specific Project-4.1: Repair of bridges to maintain function;
- Site-Specific Project-4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (*e.g.*, earthquake standards); and
- Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where practicable, improve flow conditions for fish passage and sediment transport.

Dewatering of an area will be accomplished within a few days or less and, if present, flow will be maintained downstream of dewatered areas. Therefore, changes in flow are not anticipated to occur downstream of project sites during dewatering activities. Stream flow in the vicinity of each project site should be the same as free-flowing conditions except at the dewatered reach where stream flow is bypassed.

Stream flow diversion and dewatering are expected to cause temporary loss, alteration, and reduction of aquatic habitat. Caltrans anticipates that only a small reach of stream at each project site will be dewatered for in-channel construction activities (typically less than 100 meters in length). Stream flow diversions could concentrate or strand individual rearing juvenile coho

salmon, Chinook salmon, and steelhead in residual wetted areas (Cushman 1985) before they are relocated, or cause them to move to adjacent areas of poor habitat (Clothier 1953, Clothier 1954, Kraft 1972, Campbell and Scott 1984). Rearing juvenile salmon, steelhead, or both could be killed or injured if crushed during diversion activities, though direct mortality is expected to be minimal due to relocation prior to installation of the diversion.

3. Fish Handling Estimates

In District 1, CCC and NC steelhead, CCC and SONCC coho salmon, and CC Chinook salmon occur. In District 2, NC steelhead, SONCC coho salmon, and CC Chinook salmon occur. In District 4, CCC, SCCC and NC steelhead, CCC coho salmon, and CC Chinook salmon occur. Dewatering and fish relocation activities will occur during the summer or early fall low-flow period, after emigrating smolts have left and before adults have immigrated to project sites. Juvenile steelhead and coho salmon (to a much lesser extent) will make up the majority of salmonids present during dewatering and relocation activities. Few CC Chinook salmon are expected since the majority of Chinook salmon juveniles emigrate in spring and early summer as smolts.

Caltrans worked closely with NMFS to complete a thorough review of the available scientific literature to estimate the density of federally protected juvenile fish species under NMFS jurisdiction (*i.e.* Chinook salmon, coho salmon and steelhead) where present within the coverage area. The density data were provided for various streams and rivers within the action area (Caltrans 2010). Based on these data, Caltrans (2010) presented multiple values of fish densities for each species (*i.e.*, average, highest, lowest, and 90th percentile). Caltrans applied these densities to the typical project length that requires fish relocation (approximately 100 meters of stream channel) to generate estimated fish handling numbers by species per project. Caltrans (2010) estimated the following frequency of projects requiring fish relocation per District per year: District 1: 2 projects, District 2: 1 project, District 4: 2 projects (5 total projects). Caltrans (2010) used these estimates to expand fish handling numbers by species to an annual District level.

NMFS used the 90th percentile densities (0.53 coho salmon per meter and 0.72 steelhead per meter), typical project length (100 meters), and estimated annual number of projects requiring fish relocation to estimate District and Program-level take for each species. Due to seasonal restrictions on dewatering and fish relocation and the quality of habitat surrounding Caltrans infrastructure, projects are likely to occur in areas where the densities of juvenile salmonids are extremely low. Therefore, the majority of projects will result in very few, if any, capture and relocation of ESA-listed species. Based on this information, Caltrans and NMFS have agreed to limit the total number of projects that involve relocation of ESA-listed species to 10 projects per district, per year, rather than limit the number of projects to the values used to estimate fish

relocation numbers (1 to 2 projects per district). The annual maximum numbers for each species, however, may not exceed the estimates presented below.

Depending upon where fish relocation projects for each District occur within the District boundaries, and which ESU or DPS occurs at that project site, each District's annual total for fish relocation could include varying numbers of each ESU/DPS. Therefore, to calculate the amount of fish relocated by each District per year, the total number of coho (SONCC, CCC combined), Chinook (only CC Chinook), and steelhead (NC, CCC, SCCC combined) were used.

NMFS conservatively estimates that no more than 362 juvenile steelhead, 260 juvenile coho salmon, and 75 juvenile Chinook salmon per year (*i.e.*, 3,620 juvenile steelhead, 2,600 juvenile coho salmon, and 750 juvenile Chinook salmon over the 10 year Program) will be captured and relocated. By Caltrans District, the following numbers of juvenile salmonids may be captured and relocated in a given calendar year:

- District 1: 145 steelhead, 108 coho salmon, and 25 Chinook salmon;
- District 2: 72 steelhead, 54 coho salmon, and 25 Chinook salmon;
- District 4: 145 steelhead, 108 coho salmon, and 25 Chinook salmon;
- Combined Districts: 362 juvenile steelhead, 260 juvenile coho salmon, and 75 juvenile Chinook salmon; and
- Program total (over 10 years): 3,620 juvenile steelhead, 2,600 juvenile coho salmon, and 750 juvenile Chinook salmon.

In the worst case scenarios, annual numbers in each District could come from only one ESU or DPS. The following list describes these worst case scenarios.

CC Chinook salmon- Only CC Chinook salmon will be encountered under the Program and, therefore, a maximum of 75 CC Chinook salmon could be captured and relocated annually (25 CC Chinook in District 1; 25 CC Chinook in District 2; 25 CC Chinook in District 4).

CCC steelhead- If all steelhead encountered in District 1 and 4 are CCC steelhead, a maximum of 290 CCC steelhead could be captured and relocated annually (145 CCC steelhead in District 1; 145 CCC steelhead in District 4).

SCCC steelhead- If all steelhead encountered in District 4 are SCCC steelhead, a maximum of 145 SCCC steelhead could be captured and relocated annually (145 SCCC steelhead in District 4).

NC steelhead- If all steelhead encountered in District 1, 2, and 4 are NC steelhead, a maximum of 362 NC steelhead could be captured and relocated annually (145 NC steelhead in District 1; 72 NC steelhead in District 2; 145 NC steelhead in District 4).

CCC coho salmon- If all coho salmon encountered in District 1 and 4 are CCC coho salmon, a maximum of 216 CCC coho salmon could be captured and relocated annually (108 CCC coho salmon in District 1; 108 CCC coho salmon in District 4).

SONCC coho salmon- If all coho salmon encountered in District 1 and 2 are SONCC coho salmon, a maximum of 162 SONCC coho salmon could be captured and relocated annually (108 SONCC coho salmon in District 1; 54 SONCC coho salmon in District 2).

4. Fish Mortality and Injury Estimates

Fish relocation activities do pose risk of injury or mortality to rearing juvenile coho salmon, Chinook salmon, and steelhead. Any 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 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. The effects of seining and dip-netting on juvenile salmonids include stress, scale loss, physical damage, suffocation, and desiccation. Electrofishing can kill juvenile salmonids, and researchers have found serious sublethal effects including spinal injuries (Reynolds 1983, Habera *et al.* 1996, Habera *et al.* 1999, Nielsen 1998, and Nordwall 1999). The long-term effects of electrofishing on salmonids are not well understood. Although chronic effects may occur, NMFS assumes that most impacts from electrofishing occur at the time of sampling. Since fish relocation activities will be conducted by a designated qualified fisheries biologist following NMFS' electrofishing guidelines (NMFS 2000), injury and mortality of listed juvenile salmonids during capture will be minimized.

Although sites selected for relocating fish should have similar water temperature as the capture site and 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 salmonids causing increased competition for available resources such as food and habitat (Keeley 2003). Some of the fish at the relocation sites may choose not to remain in these areas and may move either upstream or downstream to areas that have more habitat and less density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. 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, most fish relocation activities will involve a small number of fish that will be released into habitats that have similar conditions (*i.e.*, habitat quantity and quality) to the areas where fish were removed. In cases where this is not possible, fish will be released in multiple

sites to facilitate fish dispersion and limit competition. Once the project is complete and the diversion facilities are removed, juvenile salmonid rearing space will return to the dewatered area.

Fish relocation activities are expected to minimize individual project impacts to juvenile salmon and steelhead by removing them from project sites where they may have experienced high rates of injury and mortality. Due to the number and timing of proposed fish relocation activities and the small areas and typically low densities of salmonids where fish relocation activities are proposed, fish relocation is only anticipated to affect a small number of rearing juvenile salmon (primarily coho) and/or steelhead (these numbers are described in greater detail below). Rearing juvenile coho salmon and/or steelhead present in the immediate project work area will be subject to disturbance, capture, relocation, and related short-term effects. Most of the adverse effects associated with fish relocation activities are anticipated to be non-lethal, however, a very low number of rearing juvenile (mostly young of year) coho salmon and/or steelhead captured may be injured or killed. Data on fish relocation efforts since 2004 shows most mortality rates are below three percent for steelhead (Collins 2004; CDFG 2005, 2006, 2007, 2008b, 2009, 2010). Fish that avoid capture during relocation would be exposed to risks associated with dewatering (described below).

During dewatering, a fisheries biologist will remain at the project work site to net and rescue any fish that become stranded. Juvenile salmon and steelhead that avoid capture in the project work area will die during dewatering activities. Due to the limited number of projects allowed which would require dewatering (30 annually), the spatial distribution of those projects, the small area affected during dewatering at each site, and the low numbers of juvenile salmonids expected to be present within each project site due to relocation activities and degraded habitat, NMFS anticipates the number of juvenile salmon and/or steelhead that will be killed as a result of stranding during site dewatering activities is low (*i.e.*, less than 1 percent of the total present during dewatering).

Abundance of benthic (bottom dwelling) aquatic macroinvertebrates may be temporarily reduced when stream habitat is dewatered (Cushman 1985). Effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities will be relatively short-lived, and rapid recolonization (about one to two months) of disturbed areas by macroinvertebrates (Cushman 1985, Thomas 1985, Harvey 1986) is expected following rewatering. In addition, the effect of macroinvertebrate loss on juvenile salmon, steelhead, or both is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flows will be maintained around the project work site. Based on the foregoing, the reduction of aquatic macroinvertebrates as a result of dewatering is not expected to reduce growth rates of listed species in the action area.

Except on rare occasions, fish relocation activities will also involve dewatering. Therefore, for purposes of these estimates, NMFS assumes all fish relocation activities will also involve dewatering. NMFS estimates mortality will be less than 4 percent total (*i.e.*, 3 percent capture and relocation plus 1 percent dewatering) of those steelhead, coho salmon, and Chinook salmon that are encountered during fish relocation and dewatering. Based on the estimated maximum number of listed salmonids captured or relocated annually (described above), the maximum annual mortality by District are expected to be:

- District 1: 5 steelhead, 4 coho salmon, and 1 Chinook salmon;
- District 2: 2 steelhead, 2 coho salmon, and 1 Chinook salmon;
- District 4: 5 steelhead, 4 coho salmon, and 1 Chinook salmon.

In the worst case scenarios, annual mortality in each District could come from only one ESU or DPS. The following list describes these worst case scenarios:

CC Chinook salmon- Only CC Chinook salmon will be encountered under the Program, and therefore a maximum of 3 CC Chinook salmon are expected to be injured or killed annually during capture, relocation, and dewatering activities (1 CC Chinook in District 1; 1 CC Chinook in District 2; 1 CC Chinook in District 4).

CCC steelhead- If all steelhead encountered in Districts 1 and 4 are CCC steelhead, a maximum of 10 CCC steelhead could be injured or killed annually (5 CCC steelhead in District 1; 5 CCC steelhead in District 4).

SCCC steelhead- If all steelhead encountered in District 4 are SCCC steelhead, a maximum of 5 SCCC steelhead could be injured or killed annually (5 SCCC steelhead in District 4).

NC steelhead- If all steelhead encountered in Districts 1, 2, and 4 are NC steelhead, a maximum of 12 NC steelhead could be injured or killed annually (5 NC steelhead in District 1; 2 NC steelhead in District 2; 5 NC steelhead in District 4).

CCC coho salmon- If all coho salmon encountered in Districts 1 and 4 are CCC coho salmon, a maximum of 8 CCC coho salmon could be injured or killed annually (4 CCC coho salmon in District 1; 4 CCC coho salmon in District 4).

SONCC coho salmon- If all coho salmon encountered in Districts 1 and 2 are SONCC coho salmon, a maximum of 6 SONCC coho salmon could be injured or killed annually (4 SONCC coho salmon in District 1; 2 SONCC coho salmon in District 2).

B. Increased Mobilization of Sediment

Implementation of all Site-Specific Projects authorized in the proposed Program have the potential to temporarily increase suspended sediment levels within the project work site and downstream areas which may cause temporary increases in turbidity. The anticipated increases in suspended sediment concentrations and turbidity levels resulting from individual maintenance activities (*i.e.*, Project Actions) authorized under this Program, including but not limited to construction and removal of dewatering facilities, cleaning of accumulated sediments from culverts or bridge structures, access road construction, and geotechnical drilling, are expected to be minor and temporary due to the small work footprint of most projects and the time of year (dry season, low flow conditions), which makes the mobilization of large volumes of sediment unlikely. Furthermore, Caltrans will minimize impacts related to increases in suspended sediment and turbidity by implementing multiple erosion control, water quality protection, and sediment containment minimization measures and BMPs described in Caltrans (2010).

High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelly 1961, Berg and Northcote 1985), reduce growth rates (Sigler *et al.* 1984, Sigler 1988, Swetka and Hartman 2001), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also cause fish mortality (Sigler *et al.* 1984; Berg and Northcote 1985; Gregory and Northcote 1993; Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing chances of survival. With regard to physical habitat condition, increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles. Alexander and Hansen (1986) measured a 50 percent reduction in brook trout (*Salvelinus fontinalis*) density in a Michigan stream after manually increasing the sand sediment load by a factor of four. In a similar study, Bjornn *et al.* (1977) observed that salmonid density in an Idaho stream declined faster than available pool volume after the addition of 34.5 cubic meters of fine sediment into a 165 meter study section. Both studies attributed reduced fish densities to a loss of rearing habitat caused by increased sediment deposition. However, streams subject to infrequent episodes adding small volumes of sediment to the channel may not experience dramatic morphological changes (Rogers 2000).

Much of the research discussed above focused on turbidity levels higher than those expected to occur during implementation of the proposed activities. NMFS anticipates the resulting elevated turbidity levels will be minor and only occur for a short time, well below levels and durations shown in scientific studies as causing injury or harm to salmonids (see for example Newcombe and Jensen 1996). Most of the possible project-related sediment will likely mobilize during the initial high flow event the following winter season. These temporary increases in turbidity will be negligible when compared with the elevated background levels generated during the initial

high flow event. Therefore, minor and short-term sediment input resulting from maintenance activities is not anticipated to appreciably affect the survival, reproduction, or distribution of listed salmonids, green sturgeon, or Pacific eulachon within an individual project area.

The small temporal and spatial scale effects of sediment input associated with the Program will likely preclude significant additive effects at the watershed or population scale. Hence, NMFS expects sediment effects generated by each individual project will likely impact only the PCEs for water quality in the immediate footprint of the project location and a short distance of channel downstream of the site, with effects diminishing farther downstream of the project. Furthermore, many of the activities outlined for inclusion under this Program are, for the most part, intended to repair deficient infrastructure or reduce sedimentation from eroding banks and culverts that are presently, and will likely continue, degrading critical habitat or fish passage conditions. As described above, effects on freshwater PCEs from individual projects are expected to be short-term and minor. NMFS anticipates the PCEs for water quality in estuarine habitats for salmonids, green sturgeon and Pacific eulachon may also experience temporary yet insignificant increases in turbidity at individual project sites. Estuaries (*e.g.*, San Francisco Bay and Delta) are typically more turbid than upstream freshwater riverine habitats and they are large enough that fish to can relocate to other unaffected areas.

C. Vegetation Removal

All Site-Specific Projects could include some level of vegetation management actions including the removal or trimming of riparian, aquatic, and upland vegetation as part of their proposed routine maintenance activities. This will include vegetation management activities that will occur below the OHWL, in designated critical habitat for the SONCC and CCC coho salmon ESUs, SRWR, CVSR, and CC Chinook salmon ESUs, NC, CCC, CV, and SCCC steelhead DPSs, and the southern DPSs of green sturgeon and Pacific eulachon. Listed salmonids (juvenile SONCC and CCC coho salmon, CC Chinook salmon, and NC, CCC, and SCCC steelhead) will be relocated or excluded from areas where vegetation removal activities are likely to adversely affect listed species (*i.e.*, removal of aquatic vegetation with heavy equipment). Covered activities likely to have larger impacts to vegetation will be associated with culvert repair and replacement, bridge repair and replacement, and access roads associated with these and other activities. The removal of vegetation as a result of implementing these activities will only occur when it is necessary for the protection of existing infrastructure (such as bridges, bridge abutments, wingwalls, piers, culverts, or road embankments) threatened by flow-related erosion or debris collection, or to prepare or access a worksite. Typically, the area of vegetation removed in association with the proposed maintenance activities is relatively small. NMFS will be notified of proposals to remove mature trees or vegetation greater than 20 feet from infrastructure and, if necessary, provide guidance on avoidance of sensitive areas. Furthermore, projects will not remove more than 5,000 square feet (0.11 acres) of riparian or wetland/aquatic

vegetation below the OHWL or within 150 linear feet of the OHWL (see section *II. B. Project Categorization, Limits, and Minimization Measures*).

Streamside and wetland/aquatic vegetation is expected to be altered (*i.e.*, trimmed), and in some situations, lost (*i.e.*, felled or grubbed). Alteration or loss of streamside and wetland/aquatic vegetation is of concern due to the benefits it provides to aquatic ecosystems and populations of rearing fish. Riparian zones and wetland/aquatic vegetation serve important functions in stream ecosystems such as providing shade (Poole and Berman 2001), sediment storage and filtering (Cooper *et al*. 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and stream bank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisle 1986, Shirvell 1990), and both cover and shelter for fish (Bustard and Narver 1975, Wesche *et al*. 1987, Murphy and Meehan 1991). Small perennial streams are especially sensitive to loss of riparian habitat and shade, which moderates stream temperatures by insulating the stream from solar radiation and reducing heat exchange with the surrounding air. The reduction of vegetation and debris also affects aquatic insects in the channel by limiting their food source or substrate in which they live. However, with the application of BMPs and other minimization measures described below, NMFS expects the effects of vegetation removal and management on salmonids, green sturgeon, and Pacific eulachon and their habitat will be minor and short-term for a variety reasons, as described below.

Caltrans has proposed several measures to minimize impacts associated with vegetation removal as part of implemented activities under the Program. As noted above, the amount of vegetation typically removed in association with the proposed activities is small, and is usually restricted to localized areas at existing infrastructure (*e.g.*, culvert inlets/outlets, bridge piers or wingwalls). Wherever possible, vegetation will be trimmed leaving their root systems intact; willows and emergent vegetation resprout and grow rapidly (Conroy and Svejcar 1991). Caltrans will select access routes where vegetation clearing and removal will occur in areas with the least amount of riparian or wetland/aquatic vegetation disturbance and/or are dominated by non-native plant species. Caltrans has proposed to revegetate all disturbed areas with native species at required ratios as determined by CDFW[16], except where revegetation will interfere with Caltrans' infrastructures, create fish passage problems, limit visual access to culvert inlets and outlets, or require continued and sustained maintenance. The replacement of non-native vegetation with native vegetation is expected to benefit habitat for listed species, particularly juvenile salmonids, over the long term. In most cases, adjacent instream and riparian vegetation, not targeted for removal, would continue to provide a source of shade, allochthonous material, and instream cover.

[16] Revegetation ratios are based on the size of the trees to be removed, specifically their diameter at breast height. Larger trees generally require larger ratios.

Vegetation removal will only occur on an as-needed basis and therefore it is difficult to accurately anticipate the number, scope and frequency of projects in a particular watershed or stream. Potential impacts to PCEs of designated critical habitat from vegetation clearing may include an increase in water temperatures by reducing shade, a localized reduction of allochthonous inputs, and a loss of cover in the channel. Based on the proposed BMPs and minimization measured described above, NMFS concludes the impacts associated with vegetation removal associated with their maintenance activities are unlikely to appreciably diminish the value of PCE's for spawning, rearing, or migration for ESA-listed salmonids, southern DPS of green sturgeon, or similar physical and biological features essential for the conservation of the southern DPS of Pacific eulachon. Furthermore, based on the factors described above, NMFS does not anticipate the removal of vegetation will result in taking of ESA-listed salmonids.

D. Toxic Chemicals

All Site-Specific Projects could involve the use of equipment and equipment refueling, fluid leakage, and maintenance activities (*i.e.,* herbicides for vegetation management along roadsides or in drainage ditches) within and near the stream channel that pose some risk of contamination and potential harm to ESA-listed fish or their habitats. However, equipment fueling will occur at least 50 feet from the OHWL, and all equipment will be washed and inspected for leaks prior to entering waterways and periodically during the day. In addition to toxic chemicals associated with construction equipment, water that comes into contact with wet cement during construction of a maintenance project can also adversely affect water quality and could potentially adversely affect ESA-listed salmonids. However, cement will be installed and cure in dewatered or dry areas and, therefore, water quality will not be adversely affected. For instream construction activities, NMFS does not anticipate any localized water quality degradation from toxic chemicals; therefore, a reduction in the fitness of individual listed fish residing within the action area is not anticipated. NMFS anticipates that proposed minimization measures and responses by Caltrans to any accidental spill of toxic materials would be sufficient to restrict the effects to the immediate area and not enter the waterway; therefore, NMFS expects that the function of critical habitat (particularly the PCEs associated with water quality) for ESA-listed salmonid ESUs/DPSs within the action area, as well as the southern DPSs of green sturgeon and Pacific eulachon, will not be impaired.

E. Beneficial Effects

The following Site-Specific Projects could include some beneficial effects on listed species and designated critical habitat:

- Site-Specific Project-3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions;
- Site-Specific Project-3.3: Rehabilitation of culverts to maintain function;
- Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where applicable, improve flow conditions to support fish passage and sediment transport; and
- Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where applicable, improve flow conditions for fish passage and sediment transport.

Examples of these benefits include removal of debris from a culvert that is blocking the conveyance of water and sediment, and impairing fish passage; or retrofit of a dysfunctional or inadequate fishway. Bridges and culverts replaced under this Program are all expected to improve both upstream and downstream habitat (and habitat accessibility) through enhancement of geomorphic function, water conveyance, and fish passage through crossings and will decrease the likelihood of infrastructure failure, thus preventing potential occurrences of significant bank erosion and stream habitat impairment. The extent of these beneficial effects could be substantial. Replacement of one bridge or culvert that blocks fish passage or habitat continuity could restore spawning and/or rearing to a potentially large area. This in turn could have a population level effect on salmonid abundance and distribution. A more common activity, such as cleaning, could have an immediate benefit to fish passage and habitat through restoring flow and by preventing catastrophic failure of banks or Caltrans infrastructure. Therefore, cleaning, which may occur multiple times across the large action area, could also have population or species level beneficial effects.

VII. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions, not involving Federal activities that are reasonably certain to occur in the action area considered in this 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.

Because of the relatively large action area, it is difficult to identify specific numbers of future state, tribal, local, or private actions that are reasonably certain to occur within the action area. However, geographic trends in land use, climate change, and population growth do provide some indication of what can be expected in the future. The effects of climate change in the action area are described above in *IV.E. Additional Threats to Species and Critical Habitat* and will not be repeated in this section as those effects relate to Cumulative Effects. However, the effects of climate change in the action area during the period of the proposed action have not been

specifically determined and will likely be within the approximate range of those currently occurring. State, tribal, local, or private actions that may affect listed species within the action area include timber management, suppression of wildfires, industrial activities, population growth resulting in residential and commercial development. These actions, while broad in scale, are likely to continue into the future at a rate similar to that experienced in the past.

A. Timber Management

Timber management is prevalent within the action area and includes, for example, the harvest, yarding, loading, and hauling of timber; site preparation, such as identifying areas of harvest; and road building. Timber management also includes the replanting of harvest areas, vegetation management, and thinning.

Future timber harvest levels in the action area cannot be predicted; however, it is assumed that, for the foreseeable future, levels will be within the approximate range of those occurring since the listing of the northern spotted owl in 1992. Between 1992 and 2011 for the counties within the action area, the average annual harvest volume was 894 million board feet (MMBF), with most of the harvest occurring in Humboldt, Mendocino, and Siskiyou Counties[17]. It is assumed similar trends in harvest will continue.

Facilities are expected to operate within applicable laws. Where wastewater discharge may affect habitat for listed species, it is expected that the ESA and CESA will be enforced. Most sawmills processing logs from timber harvest activities in the action area are expected to remain in operation for the foreseeable future, based on a relatively steady supply of timber, as discussed above. The reduction in available old-growth logs will probably result in closure or retooling of those mills designed to process large logs.

Implementation of timber harvest plans (THPs) under the California Forest Practice Rules (CFPRs) has not consistently provided protection against unauthorized take of Pacific salmon. An independent scientific review panel found in 1999 that the CFPRs and their implementation did not adequately achieve functioning habitat conditions necessary to protect listed salmonids (Ligon *et al*. 1999). Following that finding, the California Department of Forestry and Fire Protection adopted interim rules to attempt to strengthen the CFPRs. Overall, NMFS continues to find the implementation of these interim rules still does not "ensure the achievement of properly functioning habitat for conservation of anadromous salmonids throughout their range in California" (Simpson Resource Company 2002, as cited in Caltrans 2010). Until these issues are resolved, unauthorized take from direct and indirect effects on covered salmonids from timber harvest and its associated activities may occur. The extent and amount of any unauthorized take of salmonids are unknown.

[17] http://frap.cdf.ca.gov/projects/BOE/BOETimberTax.html (last visited on September 26, 2013)

Reasonably foreseeable effects of timber management activities may also affect designated critical habitat for covered species within the action area. Direct and indirect effects of timber management has the potential to degrade all PCEs in freshwater habitats of Pacific salmon and steelhead designated critical habitat that are present within the action area. This is particularly true for coastal populations where timber harvest is a predominant land use.

B. Suppression and Control of Wildfires

Based on current practice, the California Department of Forestry and Fire Protection in conjunction with other state and federal agencies will likely be involved in the suppression or control of wildfires in the action area during the term of the proposed action. Future levels of suppression or control of wildfires in the action area cannot be predicted; however, it is assumed that, for the foreseeable future, levels will be within the approximate range of those currently occurring.

Suppression or control measures may include thinning and removal of fuels (*e.g.*, trees, downed branches, and litter), conducting prescribed burns before a wildfire incident, constructing fire breaks, setting backfires, and cooling the fire edge with water. Equipment such as helicopters, aircraft, fire engines, bulldozers, and hand crews operate at various times of the year. These activities may result in the disturbance of covered species. An undetermined number of individuals may be affected by this activity annually during each year of the proposed action.

In addition, suppression or control of wildfires may include the removal or modification of vegetation as a result of the construction of firebreaks or the setting of backfires to control the spread of fire. An undetermined amount of suitable habitat for covered species may be removed or modified by this activity.

C. Industrial Activities

Currently, quarrying, gravel mining, and associated processing operations are located within the action area, and will likely continue to be operated by non-federal parties. Current operations fall under the jurisdiction of the California Coastal Commission (for those activities conducted within the state's coastal zone), the Corps, and any local governments, and will likely continue to do so in the future. Future demand cannot be estimated, but it may increase as private timber and agricultural landowners look for ways to increase revenue generated from their lands. The effects on listed species from quarries and rock mines depend on the type of mining, size of the quarry or mine, and distance from surface waters and groundwater features. Rock mining near surface waters can cause increased sedimentation, accelerated erosion, incised stream banks, streambed instability, and changes to substrate. Surface mining may compact soils, remove vegetative cover and the humic layer, and increase surface runoff. Mining may also cause the loss of riparian vegetation and cause the transportation of toxic chemicals to surface waters. Because the effects

of quarries and rock mines depend on several variables, the extent of effects of the operations on covered species within the action area are unknown.

D. Population Growth

The U.S. Census Bureau estimates California's population at approximately 38 million in 2012, up from 37.25 million in 2010. The state population is projected to increase to about 40.1 million by 2015. Between 1990 (29.76 million) and 2000 (33.87 million), the state experienced a 13.82 percent growth in population. California had the 18th-highest population growth by percentage among all states in that time period. However, most of this population growth was concentrated outside the northern coastal areas in the action area, with only three of the counties within the action area experiencing growth rates above the state average (Sonoma at 18.13 percent, Del Norte at 17.25 percent, and Contra Costa at 18.05 percent). Trinity County experienced a negative growth rate for that time period (loss of 0.31 percent). The areas with the highest population densities are in the coastal areas surrounding the major cities of Los Angeles, San Diego, and the San Francisco Bay Area, as well as within the interior valleys such as the Sacramento Valley. Future growth patterns are expected to continue to follow historical patterns.

Population growth results in increasing residential and commercial development. Primary effects of land development include direct habitat loss, decreased water quality, contamination of natural resources (*e.g.*, groundwater, surface waters, and land), changes to runoff patterns, habitat fragmentation, isolation of wildlife populations, and decreased habitat diversity. As development increases, the general quantity and quality of habitat suitable for threatened and endangered species will most likely decrease.

The amount of build-out associated with the projected population growth will likely lead to further habitat degradation, focused primarily in current metropolitan areas. Actions taken to mitigate for the potential impacts of development, such as avoidance of habitat critical to species survival and conservation, as well as strong urban/rural boundaries, can help minimize and slow the rate of habitat degradation, in some instances avoiding degradation entirely.

VIII. INTEGRATION AND SYNTHESIS OF EFFECTS

Coho salmon populations throughout the action area have shown a dramatic decrease in both numbers and distribution (Spence *et al.* 2008, Spence and Williams 2011, and Williams *et al.* 2011); SONCC coho salmon and CCC coho salmon do not occupy many of the streams where they were found historically. Although SONCC coho salmon are relatively more abundant and better distributed than CCC coho salmon, both the presence-absence and trend data available suggest that the SONCC coho salmon numbers continue to decline, and the ESU remains likely to become endangered in the foreseeable future (Williams *et al.* 2011).

For CCC coho salmon, the available information suggests their abundance is very low, the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative), and populations have experienced range constriction, fragmentation, and a loss of genetic diversity (Spence and Williams 2011). Many subpopulations that may have acted to support the species' overall numbers and geographic distribution have likely been extirpated or reduced to critically low numbers supported largely by conservation hatchery plantings (*i.e.*, Russian, San Francisco Bay Area, and Napa HUCs). The poor condition of their habitat in many areas and the compromised genetic integrity of some stocks pose a serious risk to the survival and recovery of CCC coho salmon (NMFS 2012b). Spence and Williams (2011) concluded the available population trends since the last status review indicate conditions have worsened for populations in the CCC coho salmon ESU, and that the risk of extinction appears to have increased since 2005, when Good *et al.* (2005) concluded the ESU was in danger of extinction.

Information on the current abundance and distribution of CC Chinook salmon throughout the ESU is sparse. Previous status reviews (Myers *et al.* 1998, Good *et al.* 2005) concluded that CC Chinook salmon were likely to become endangered in the foreseeable future. Contributing factors for this determination were the apparent loss of the spring-run life history type throughout the entire ESU as well as the apparent loss of several populations in the southern portion of the ESU including the Ten Mile, Noyo, Big, Little, Navarro, Gualala, and Garcia rivers (Good *et al.* 2005, Williams *et al.* 2011). Williams *et al.* (2011) concluded there was not sufficient evidence to suggest a significant improvement in the ESU, nor did new and additional information available since Good *et al.* (2005) warrant a change in extinction risk (*i.e.*, likely to become endangered). However, in the Eel River[18], adult CC Chinook salmon returns during the fall-winter of 2012/2013 were the highest observed in since the 1930s and in the Russian River, the number of adults counted in the lower river was the highest total since counting began by the Sonoma County Water Agency in 2000.[19]

Steelhead populations throughout NC, CCC, and SCCC DPSs have decreased in abundance, but are still widely distributed (Good *et al.* 2005, Williams *et al.* 2011). Although each of these DPSs have experienced significant declines in abundance, and long-term population trends suggest a negative growth rate, they have maintained a better distribution overall when compared to coho salmon ESUs. This suggests that, while there are significant threats to the population, they possess a resilience (based in part, on a more flexible life history) that likely slows their decline. However, the poor condition of their habitat in many areas and the compromised genetic integrity of some stocks pose a risk to the survival and recovery of these steelhead DPSs. Based on the above information, recent status reviews (Williams *et al.* 2011) and available

[18] http://www.eelriverrecovery.org/ (last visited on September 26, 2013)
[19] http://www.scwa.ca.gov/chinook/ (last visited on September 26, 2013)

information all indicate NC, CCC, and SCCC steelhead are likely to become endangered in the foreseeable future.

Some of the currently accessible listed salmonid, green sturgeon, and eulachon habitat throughout the action area has been severely degraded, and the condition of designated critical habitats, specifically its ability to provide for the conservation of listed salmonid, green sturgeon, and eulachon analyzed in this biological opinion, has also been degraded from conditions known to support viable populations. A number of anthropogenic factors have been identified as causes contributing to the modification and curtailment of listed fish habitat in central and northern California. These include: logging, agricultural, urban development, mining, stream channelization, dams and diversions, and wetland/riparian habitat loss. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large wood in channels, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, increases in erosion entry to streams from upland areas, loss of shade (higher water temperatures), and loss of nutrient inputs (61 FR 56138, October 31, 1996).

As described in section *VII. Cumulative Effects* above, it is difficult to identify specific number of actions included under the cumulative effects that are reasonably certain to occur within the action area. These actions, while broad in scale, are likely to continue into the future at a rate similar to that experienced in the past.

Although projects proposed under Caltrans' Program will be for the purpose of maintaining and providing structurally sound transportation infrastructure while in some cases generally improving accessibility to and quality of habitat, adverse effects to listed salmonids and salmonid, green sturgeon, and eulachon critical habitats are expected. Adverse effects to listed salmonids at project sites are primarily expected to be in the form of short-term behavioral effects with a minimal amount of mortality. Salmonids present during the implementation of any of these projects may be disturbed, displaced, injured or killed by project activities, and salmonids present in some project work areas will be subjected to capture, relocation, dewatering and related stressors.

Based on several factors including the lack of recent confirmed spawning of SRWR Chinook salmon, CVSR Chinook salmon, CV steelhead, and the Southern DPSs of green sturgeon and Pacific eulachon in watersheds within the action area, the time of year project activities will be implemented, the life histories and migration timing of these species, and the infrequency and small scale of dewatering and fish relocation projects, NMFS does not anticipate take of these species.

The number of fish injured or killed during relocation, dewatering or construction is not expected to have a detectable effect on the overall individual stream populations of salmonids. This is because only a small portion of an ESU/DPS's entire juvenile population will be exposed to electrofishing over the Program's ten year period and only a very small portion of those salmonids electrofished will be injured or killed (*i.e.*, no more than three percent). An even smaller portion of an ESU/DPS's juvenile population will be injured or killed during dewatering and construction activities *(i.e.*, one percent). In addition, much of the SCCC steelhead DPS will not be impacted because of the geographic limits of the action area. It is unlikely that the loss of a few juveniles from each watershed each year will reduce future adult returns. Due to the relatively large number of juveniles produced by each spawning pair, salmon and steelhead spawning in these watersheds in future years are likely to produce enough juveniles to replace the ones that may be lost during relocation and dewatering.

Caltrans' routine maintenance activities authorized through this consultation will be designed and implemented consistent with techniques and minimization measures outlined in the project description, including NMFS/CDFW's guidelines for salmonid passage at stream crossings, NMFS' electrofishing guidelines, and NMFS' screening guidelines in order to minimize adverse effects to salmonids. Although there will be short-term impacts to salmonid habitat, including critical habitats, associated with a small percentage of projects implemented annually, NMFS anticipates most projects will either have temporary impacts (*i.e.*, adverse), or will provide long-term improvements (*i.e.*, beneficial) to salmonid, green sturgeon, and Pacific eulachon habitat. NMFS does not anticipate any of the implemented activities, individually or in combination, performed as described and intended, will have a significant adverse impact to critical habitat or the populations themselves.

Based on the above information, NMFS concludes that the effects of Caltrans' proposed Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4 are not likely to reduce the reproduction, numbers, or distribution of the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, southern DPS of green sturgeon or southern DPS of Pacific Eulachon; and are not likely to diminish the conservation value of designated critical habitat for the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, Southern DPS of North American green sturgeon, or Southern DPS of Pacific Eulachon.

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

action, as proposed, and the cumulative effects, it is NMFS' biological opinion that implementation of Caltrans' proposed Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4 is not likely to jeopardize the continued existence of the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, southern DPS of green sturgeon, and southern DPS of Pacific Eulachon.

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 action, as proposed, and the cumulative effects, it is NMFS' biological opinion that Caltrans' proposed Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4 is not likely to destroy or adversely modify designated critical habitat for the SONCC coho salmon ESU, CCC coho salmon EUS, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, Southern DPS of North American green sturgeon, or the Southern DPS of Pacific Eulachon.

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 and the Corps, for the exemption in section 7(o)(2) to apply. Caltrans and the Corps have a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans, or its contractors, or the Corps (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, as lead Federal action agency, the Corps or the Corps' applicant, 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

NMFS estimates that no more than 362 juvenile steelhead, 260 juvenile coho salmon, and 75 juvenile Chinook salmon may be present during dewatering activities in a given calendar year (*i.e.* 3,620 juvenile steelhead, 2,600 juvenile coho salmon, and 750 juvenile Chinook salmon over the 10-year Program). For certain activities (described above) any fish present during the construction window will need to be captured and relocated. Based on the low mortality rates associated with typical relocation efforts, NMFS anticipates no more than four percent of the juvenile salmonids present in the areas to be dewatered will be killed or injured during capture, relocation and dewatering.

Incidental take is limited on an annual basis per Caltrans District. Take will be exceeded if any of the following annual District specific measures are exceeded:

District 1

- Annually, if more than 10 projects involving capture or relocation of listed salmonids occur, OR
- Annually, if more than a total of 145 steelhead, 108 coho salmon, or 25 Chinook salmon are present during dewatering, fish capture, and relocation, OR
- Annually, if more than a total of 5 steelhead, 4 coho salmon, and 1 Chinook salmon are injured or killed during dewatering, fish capture, and relocation.

District 2

- Annually, if more than 10 projects involving capture or relocation of listed salmonids occur, OR
- Annually, if more than a total of 72 steelhead, 54 coho salmon, and 25 Chinook salmon are present during dewatering or fish capture and relocation, OR
- Annually, if more than a total of 2 steelhead, 1 coho salmon, and 1 Chinook salmon are injured or killed during dewatering, fish capture, and relocation.

District 4

- Annually, if more than 10 projects involving capture or relocation of listed salmonids occur, OR
- Annually, if more than a total of 145 steelhead, 108 coho salmon, or 25 Chinook salmon are present during dewatering or fish capture and relocation, OR
- Annually, if more than a total of 5 steelhead, 4 coho salmon, and 1 Chinook salmon are injured or killed during dewatering, fish capture, and relocation.

B. Effect of the Take

In the accompanying opinion, NMFS determined this level of anticipated take is not likely to jeopardize the continued existence of the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, or SCCC steelhead DPS.

C. Reasonable and Prudent Measures

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of SONCC coho salmon, CCC coho salmon, CC Chinook salmon, NC steelhead, CCC steelhead, and SCCC steelhead:

1. Measures shall be taken to minimize the amount or extent of incidental take of listed salmonids resulting from Program activities

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Caltrans, and their contractors or designees, and the Corps, 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, which states that measures shall be taken to minimize the amount or extent of incidental take of listed salmonids resulting from Program activities:

    a. The Caltrans or Corps biologist (or their designee) shall notify NMFS biologists Joe Heublein at (707) 575-1251 or joe.heublein@noaa.gov, or Joel Casagrande at (707) 575-6016 or joel.casagrande@noaa.gov, or Chuck Glasgow at (707) or chuck.glasgow@noaa.gov one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities.

    b. Captured fish shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age-classes and other potential aquatic predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat conditions are present to allow for survival of transported fish and fish already present.

c. If any salmonids are found dead or injured, the biologist shall contact the following NMFS biologists by phone immediately: Joe Heublein (707) 575-1251, Joel Casagrande (707) 575-6016, in the NMFS North-Central Coast Office, or Chuck Glasgow (707) 825-5170 in the NMFS Northern California Office. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location of collection, fork length measured, and will be frozen as soon as possible. Frozen samples shall be retained until specific instructions are provided by NMFS. The Caltrans or Corps biologist may not transfer biological samples to anyone other than the NMFS North-Central Coast Office without obtaining prior written approval from NMFS. Any such transfer will be subject to such conditions as NMFS deems appropriate.

d. All cofferdams, pumps, pipes and sheet plastic will be removed from the stream upon Project completion; any clean native gravel used for the cofferdams will be left in the channel to augment available spawning habitat but will be graded to ensure the gravel does not impede or prevent fish passage for adult or juvenile salmonids.

e. All pumps used to divert live stream flow, outside the dewatered work area, will be screened and maintained throughout the construction period to comply with NMFS' Juvenile Fish Screening Criteria. See: http://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish_screen_criteria_for_pumped_water_intakes.pdf

f. An electronic copy of reporting forms will be provided to NMFS within 10 business days of Category 3 project completion.

g. Caltrans will identify fish passage barriers in the Program and propose passage improvements for NMFS approval.

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.

- NMFS encourages Caltrans to prioritize and expedite the improvement of (or provide funding for the improvement of) fish passage at existing barriers located within or

associated with Caltrans maintained facilities per the requirements of California State Senate Bill 857.

- To offset unavoidable temporary and permanent impacts to riparian habitats (including designated critical habitats) and the potential take of ESA-listed salmonids associated with implementation of the proposed activities, NMFS recommends and strongly encourages Caltrans purchase compensatory mitigation credits at established conservation banks located within the Programmatic action area.

- Caltrans, with assistance from NMFS and other state, federal, and local resource agencies, should continue with the development and implementation of a large woody material inventory tracking system for materials stored at agency facilities. The inventory system will track the quantity, size, and quality of large woody material at each storage facility, which could then serve as a resource for restoration planners that may need large wood for local habitat enhancement projects.

XII. REINITIATION NOTICE

This concludes formal consultation for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans Districts 1, 2, and 4, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by Caltrans or the Corps, where discretionary Federal involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of taking specified in the incidental take statement 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; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

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XIV. FEDERAL REGISTER NOTICES CITED

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Enclosure 2

ESSENTIAL FISH HABITAT CONSULTATION

ACTION AGENCIES: California Department of Transportation (Caltrans) and U.S. Army Corps of Engineers (Corps)

ACTION: Caltrans' Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4, and individual Corps permits for these activities

CONSULTATION CONDUCTED BY: National Marine Fisheries Service, Southwest Region

TRACKING NUMBER: 2013-9731

DATE ISSUED: **September 30, 2013**

I. STATUTORY AND REGULATORY INFORMATION

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, establishes a national program to manage and conserve the fisheries of the United States through the development of federal Fishery Management Plans (FMPs), and federal regulation of domestic fisheries under those FMPs, within the 200-mile U.S. Exclusive Economic Zone ("EEZ"). 16 U.S.C. § 1801 *et seq*. To ensure habitat considerations receive increased attention for the conservation and management of fishery resources, the amended MSA required each existing, and any new, FMP to "describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 1855(b)(1)(A) of this title, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat." 16 U.S.C. § 1853(a)(7). Essential Fish Habitat (EFH) is defined in the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" 16 U.S.C. § 1802(10). The components of this definition are interpreted at 50 C.F.R. § 600.10 as follows: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a

sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Pursuant to the MSA, each federal agency is mandated to consult with NOAA's National marine Fisheries Service (NMFS) (as delegated by the Secretary of Commerce) with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH under this Act. 16 U.S.C. § 1855(b)(2). The MSA further mandates that where NMFS receives information from a Fishery Management Council or federal or state agency or determines from other sources that an action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by any federal or state agency would adversely affect any EFH identified under this Act, NMFS has an obligation to recommend to such agency measures that can be taken by such agency to conserve EFH. 16 U.S.C. § 1855(4)(A). The term "adverse effect" is interpreted at 50 C.F.R. § 600.810(a) as any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce quantity and/or quality of EFH. In addition, adverse effects to EFH may result from actions occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

If NMFS determines that an action would adversely affect EFH and subsequently recommends measures to conserve such habitat, the MSA proscribes that the Federal action agency that receives the conservation recommendation must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations. 16 U.S.C. § 1855(b)(4)(B).

II. ACTION AREA

The action area includes all coastal anadromous California streams from the Oregon/California border south to the San Mateo/Santa Cruz County boundary, San Francisco and San Pablo bays (including tributaries), the Sacramento-San Joaquin Delta (including tributaries) in eastern Contra Costa, Alameda, and Solano Counites, and a small portion of the upper Pajaro River watershed located in southern Santa Clara County (see Figure 1 of the Biological Opinion). The covered action area lies within Caltrans District 4 and portions of Caltrans districts 1 and 2 (Figure 1).

The action area occurs within EFH for coho salmon (*Oncorhynchus kisutch*) and Chinook salmon which are managed within the Pacific Salmon Fishery Management Plan (FMP). However, only activities proposed in freshwater habitats for Pacific salmonids will be authorized under this consultation. In freshwater, Pacific Salmon EFH overlaps with designated critical habitat for listed salmonids. Therefore, the proposed action contains measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. Proposed activities in tidal habitats (*i.e.*, brackish or marine waters) could occur in EFH associated with non-salmonid FMPs (*e.g.*, groundfish) and require specific EFH conservation recommendations not included in the preceding biological opinion. Therefore, proposed activities in tidal habitats require a separate EFH consultation with NMFS.

III. PROPOSED ACTION

California Department of Transportation (Caltrans) proposes to use Federal Highway Administration (FHWA) funds to implement routine maintenance and repair activities at existing Caltrans owned infrastructure located in Caltrans District 4 and coastal draining portions of Districts 1 and 2 from 2013 to 2023. Where FHWA money is not used, the Corps proposes to permit these Covered Activities and Caltrans will be the applicant as defined by 50 CFR 402.02. The five general Covered Activities are as follows:

- Covered Activity-1: Slide Abatement and Repair;
- Covered Activity-2: Safety Improvement;
- Covered Activity-3: Drainage System Maintenance and Repair;
- Covered Activity-4: Bridge Repair, Retrofit, Replacement and Maintenance; and
- Covered Activity-5: Maintenance Planning.

Under the Covered Activities are associated Site-Specific Projects and Project Actions, including various best management practices. These are each described in the preceding Biological Opinion.

IV. EFFECTS OF THE PROJECT PROPOSED ACTION

NMFS has evaluated the proposed project action for potential adverse effects to EFH pursuant to Section 305(b) of the MSA. Based on information developed during consultation, potential adverse effects to Pacific salmon EFH from de-watering and in-channel construction activities include: (1) temporary increase in turbidity, and (2) disturbance to benthic invertebrate community. These effects are described in the preceding biological opinion.

V. EFH CONSERVATION RECOMMENDATIONS

As described in the above effects analysis, NMFS has determined that the proposed action would adversely affect Pacific Salmon EFH. 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.

VI. SUPPLEMENTAL CONSULTATION

Pursuant to 50 CFR 600.920(l), Caltrans or the Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations

UNITED STATES DEPARTMENT OF COMMERCE
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NATIONAL MARINE FISHERIES SERVICE
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In response refer to:
2011/05415

AUG 2 7 2012

Mr. Gregg Erickson, Chief
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Dear Mr. Erickson:

On October 10, 2011, NOAA's National Marine Fisheries Service (NMFS) received your letter and biological assessment (BA) requesting informal consultation on the following activities that are part of the Caltrans' Routine Maintenance, Small Project, and Repair Program in districts 1, 2, and 4 (program), pursuant to section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.*) and its implementing regulations (50 CFR Part 402). The activities described in this consultation, are part of Caltrans' larger maintenance program, and include the following categories: 1) cleaning activities, (2) slide and slipout abatement and repair, (3) bridge maintenance and repair, (4) vegetation management, (5) grading and establishment of staging and storage areas, (6) grading of existing permanent and establishment of new temporary access roads and traffic detours, (7) drilling of geotechnical test holes, (8) construction of settling basins, (9) installation of rock slope protection (RSP)/erosion control materials and, (9) implementation of best management practices (BMPs). The remaining activities will be included in a related, but separate biological opinion, which will include activities that involve take of listed species, water drafting and dewatering, and infrastructure removal and replacement. In addition, the U.S. Army Corps of Engineers (Corps) proposes to permit these activities and is acting as a co-applicant. Caltrans is the designated non-Federal representative for the Federal Highway Administration (FHWA), which is funding activities contained within the program. Effective July 1, 2007, FHWA assigned, and Caltrans assumed the authority to approve most highway projects in California and the responsibility to conduct any environmental consultations required as a condition of such approval. Pursuant to FHWA's designation of Caltrans as a non-federal representative for the purposes of ESA Section 7 consultation with NMFS, Caltrans is acting as a Federal action agency for this consultation. The Corps is acting as a co-applicant and will be the permitting authority for this program under Section 10 of the Rivers and Harbors Act of 1899, and section 404 of the Clean Water Act.

Caltrans also requested consultation on essential fish habitat (EFH) for species managed under Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagics Fishery

Management Plans, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), 16 U.S.C. § 1855(b). This letter also serves as consultation under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) of 1934, as amended.

I. COVERED SPECIES

This consultation applies to the following species and designated critical habitat:

Chinook Salmon *(Oncorhynchus tshawytscha)*

California Coastal Chinook salmon ESU
Threatened (70 FR 37160, June 28, 2005)
Critical habitat (70 FR 52488, September 2, 2005)

Sacramento River Winter-Run Chinook salmon ESU
Endangered (70 FR 37160, June 28, 2005)
Critical habitat (58 FR 33212, June 16, 1993)

Central Valley Spring-Run Chinook salmon ESU
Threatened (70 FR 37160, June 28, 2005)
Critical habitat (70 FR 52488, September 2, 2005)

Coho Salmon *(Oncorhynchus kisutch)*

Southern Oregon/Northern California Coast coho salmon ESU
Threatened (76 FR 50447, August 15, 2011)
Critical habitat (64 FR 24049, May 5, 1999)

Central California Coast coho salmon ESU
Endangered (70 FR 37160, June 28, 2005)
Critical habitat (64 FR 24049, May 5, 1999)

Steelhead *(Oncorhynchus mykiss)*

Northern California steelhead DPS
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005)

Central California Coast steelhead DPS
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005)

California Central Valley steelhead DPS
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005)

Green Sturgeon (*Acipenser medirostris*)

Southern DPS of North American Green Sturgeon
Threatened (70 FR 17386, April 7, 2006)
Critical habitat (74 FR 52300, October 9, 2009)

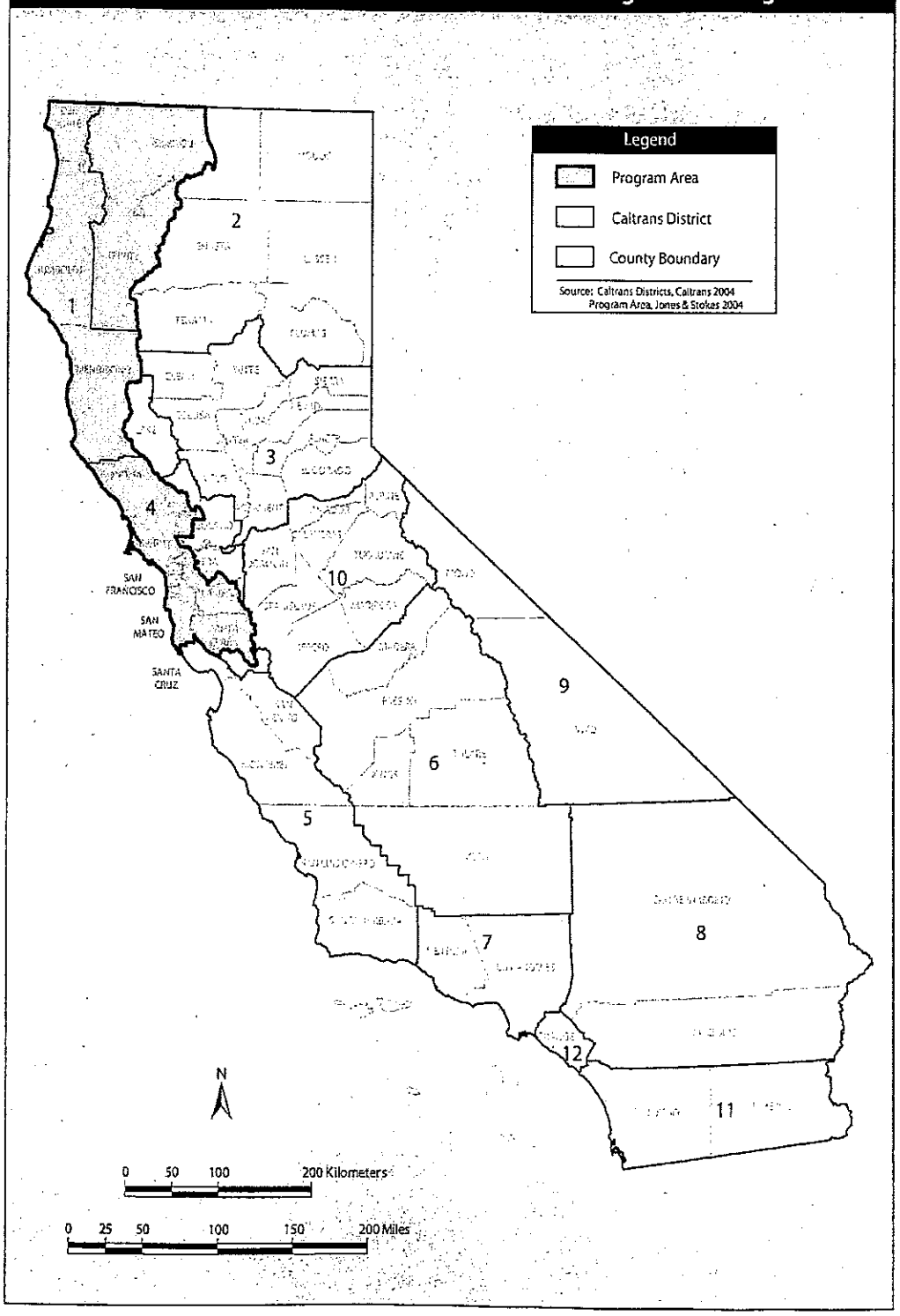
Eulachon *(Thaleichthys pacificus)*

Eulachon – Southern DPS
Threatened (75 FR 13012, March 18, 2010)
Critical habitat (76 FR 65324, October 20, 2011)

II. ACTION AREA

The action area is defined in 50 CFR 402 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area for this program encompasses parts or all of drainages within Caltrans districts 1, 2, and 4 that are within the range of salmon and steelhead. The action area begins at the Oregon border, extends down the California coast to near Santa Cruz, extends inland, and includes San Francisco Bay up to the Carquinez Strait. The Sacramento River basin and areas draining to the Delta in or above the Carquinez Strait are excluded and only coastal streams and streams that directly discharge to San Francisco Bay are covered, including the Petaluma, Napa and Guadalupe Rivers. See Figure 1-1 for further information.

Figure 1-1: Program Area



III. DESCRIPTION OF THE PROPOSED ACTION

Caltrans proposes to administer portions of their maintenance program by implementing the following routine maintenance, small project, and repair activities over the next 10 years: (1) cleaning activities, (2) slide and slipout abatement and repair, (3) bridge maintenance and repair, (4) vegetation management, (5) grading and establishment of staging and storage areas, (6) grading of existing permanent and establishment of new temporary access roads and traffic detours, (7) drilling of geotechnical test holes, (8) construction of settling basins, (9) installation of rock slope protection (RSP)/erosion control materials and, (9) implementation of best management practices (BMPs). Activities may be executed on and around all state and federal highway infrastructures, including but not limited to roads, bridges, culverts, right-of-ways, and other Caltrans owned areas adjacent to existing facilities. Activities occurring in both designated critical habitat areas or non-designated stream and upland locations are covered if they follow all applicable criteria and guidelines

Proposed project design criteria are listed by project category. These criteria include project timing, methods and materials approved for use, and any special reporting requirements. Larger, complex actions (*e.g.,* building of new infrastructure, projects needing engineering review or approval, replacement of infrastructure) cannot be separated into component elements in order to be covered by this consultation, and therefore will be consulted on individually.

A. Maintenance Activities

1. Cleaning Activities

Caltrans proposes to clean water conveyance structures of sediment and debris in order to assure proper functioning, accommodate passage of aquatic organisms, and avert failure. Types of infrastructure that may require regular cleaning include: culverts, drainage ditches, bridge abutments, and piers. Cleaning may require the use of a shovel, rake, other hand tools, a vactor, or heavy equipment such as a backhoe or excavator, and may require minutes to several hours or days to complete. For a complete list of potential cleaning activities see the 2006 Caltrans Maintenance Manual Volume 1 (Caltrans 2006).

Caltrans proposes to perform the following cleaning and maintenance activities, and adhere to project specific criteria as needed:

a. Cleaning of sediment and debris in a wetted channel, from culverts, stream channels, ditches, drainage channels, bridge abutments, and other infrastructure using only hand tools. A maximum of 2 cubic yards can be moved per site when listed species are present.

b. Cleaning of sediment and debris with heavy equipment from any infrastructure, including culverts, drainage channels, and bridge abutments. Heavy equipment includes the use of vactoring power heads, and winches. A maximum of 2 cubic yards per site can be moved when listed species are present.

c. Cleaning of sediment and debris with heavy equipment from any infrastructure, including culverts, drainage channels, and bridge abutments using heavy equipment. Heavy equipment includes the use of vactoring power heads, and winches. A maximum of 10 cubic yards per site can be removed if listed species are not present.

Specific Criteria

a. Heavy equipment must be operated outside of the wetted channel and above the Ordinary High Water Line (OHWL) unless the channel is dry or if all life stages of listed species are absent.
b. Applicable BMPs and Additional Best Management Practices (ABMPs) must be implemented before, during, and after each project.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Removal of more than 2 cubic yards of sediment and debris from culverts, drainage channels, ditches, bridge abutments and other infrastructure in a wetted channel when using heavy equipment, when listed species are not present.

2. Slide and Slipout Abatement and Repair

Caltrans proposes to implement slide abatement and repair activities that involve the repair of damaged infrastructure, and the clean-up and removal of sediment and debris from roadsides, right-of-ways, stream banks, bridges, piers and abutments. Clean up may include, but is not limited to the use of the following equipment: shovels, excavators, bulldozers, backhoes, and hand tools.

Repair activities will occur once all debris has been removed. Caltrans will perform the following slide abatement and repair activities as needed and adhere to project criteria:

a. Paving
b. Asphalt overlay
c. Placement of cement or fill material
d. Striping
e. Road improvement activities necessary to refurbish damaged roadways.
f. Excavation
g. Culvert repair and replacement
h. Drainage pipe installation
i. Temporary road building
j. Drilling
k. Backfilling
l. Installation of guard rails
m. Stabilization of road cuts and upslope areas
n. Weed abatement
o. Construction of retaining walls and other slope stabilization structures that are above the OHWL and do not create a change in hydrology.

p. Slide abatement and repair activities using hand tools. A maximum of 10 cubic yards of sediment and debris can be removed per site.
q. Slide abatement and repair activities using heavy equipment. A maximum of 10 cubic yards of sediment and debris can be removed per site.
r. All other abatement and repair activities related to landslides and infrastructure failure, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs, and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. Heavy equipment must be operated outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent. Work below the OHWL must adhere to these guidelines or be done using hand tools only.
b. Heavy equipment must remain on the road prism.
c. Heavy equipment guidelines including the channel being dry or Caltrans demonstrating (through surveys, historical and current data, existence of known barriers, etc.) no listed species are present must be followed.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Any removal of sediment, soil and debris below OHWL using heavy equipment.

3. Bridge Maintenance and Repair

Caltrans proposes to implement the following bridge maintenance and repair activities as needed and adhere to project specific criteria as described below:

a. Repairing damage or deterioration in various bridge components
b. Removing debris and drift from bridge piers
c. Fixing bearing seats
d. Cleaning abutments
e. Cleaning drains
f. Repairing expansion joints
g. Cleaning and painting structural steel
h. Sealing concrete surfaces
i. Maintenance and repair of electrical and mechanical equipment on moveable span bridges
j. Widening and replacement of railings
k. Maintenance and repair activities associated with the operation of the moveable spans.
l. Cleaning activities associated with bridge maintenance and repair.
m. All other non-construction related activities that are required to complete bridge maintenance and repair activities, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs, and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. Bridge repair and maintenance activities must follow reporting requirements as discussed above.
b. Heavy equipment must be operated outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent.

There are no post-project reporting requirements for bridge maintenance activities that do not have a cleaning component.

4. Vegetation Management Projects

Caltrans proposes to employ appropriate management (*i.e.*, maintenance) of vegetation on roadsides using an Integrated Vegetation Management (IVM) program. This program consists of using permanent vegetation control techniques that reduce the need for ongoing vegetation management. These techniques can include, but are not limited to, the following treatments: (1) concrete or asphalt application, (2) fiber or rubber weed control mat application, (3) stamped asphalt application, (4) irrigation, (5) mulch application, (6) rock blanket or rock slope protection installation in upland areas, (7) plant removal and replacement, (8) fertilization, weed and pest control, (9) growth retardant application, (10) pruning, (11) washing, (12) planting, and, (13) herbicidal fabric application . Vegetation that cannot be controlled using these techniques will be managed and removed by cutting, mowing, bulldozing, or burning, using equipment such as backhoes, front-end loaders, torches, and/or chainsaws. For a complete list of potential maintenance activities relating to vegetation management see Caltrans (2006). Heavy equipment must operate outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent.

Caltrans proposes to perform the following vegetation management activities as needed and will adhere to the project specific criteria described below:

a. Removal of riparian (of, on, or relating to the banks of a natural watercourse) and aquatic (rooted submerged) vegetation when not associated with other project types, when listed species are not present, and when no critical habitat has been designated.
b. Removal of upland vegetation when watercourse, including hydrologically connected drainage channels, are absent.
c. All other activities required for the management, maintenance and control of vegetation, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs, and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. A maximum of 10,000 cubic feet of vegetation can be removed per site.
b. Work below the OHWL must be accomplished using hand tools only or adhere to the heavy equipment guidelines below.
c. Heavy equipment must operate outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Removal of riparian and aquatic vegetation with heavy equipment.

5. Grading and establishment of Staging and Storage areas

A staging area is a designated area where vehicles, supplies, and construction equipment are positioned for access and use at a construction site. Storage areas are used to store materials, construction wastes, water, wood, soil, or rock by the roadside, and are often necessary for highway maintenance and construction activities. Staging and storage areas may be temporary (life of the project) or permanent.

Caltrans proposes to implement the following activities as needed and adhere to project specific criteria described below:

a. Installation of new staging or storage areas more than 150 feet from any watercourse
b. Grading and leveling of existing staging and storage areas that are more than 150 feet from any watercourse.
c. vegetation removal
d. ground leveling and grading
e. storage of vehicles and equipment
f. fueling of vehicles
g. Installation of artificial lighting sources.
h. Any other activities required for the maintenance or establishment of staging and storage areas, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs.

Specific Criteria

a. Areas cannot be constructed within 150 feet of a stream channel or be hydrologically connected to any watercourse.

b. When practicable, staging areas will be placed in previously disturbed areas or on the road prism to minimize ground disturbance.

c. Following use, all temporary staging areas will be re-vegetated and returned to their natural condition within 2 years of cessation of their use.

There are no post-project reporting requirements for any staging/storage area projects.

6. Drilling Geotechnical Test Holes

Caltrans proposes to utilize Geotechnical drilling as often as necessary for a variety of projects including, but not limited to: (1) building of retaining walls, (2) geotechnical investigations for bridge placements, and (3) installation of piles and other support structures. Geotechnical drilling typically consists of using a crane-deployed-platform to drill holes. To avoid chemical

contamination of watercourses, a completely enclosed mud drilling system, consisting of a Bentonite clay or water slurry mixture is pumped and circulated inside the casing during drilling so none of the drilling products escape. The drill rig typically accesses the area using existing roads or barge. Where access roads need to be developed, the road will be restored to the original topography and re-vegetated upon completion of geotechnical investigations. See below for further information regarding grading and establishment of temporary access roads. Geotechnical drilling projects may require: (1) drilling with or without a platform, (2) craning in equipment, (3) construction of access roads and drilling pads, (4) removal of trees, shrubs, and other vegetation, (5) and intermittent lane closures with traffic control. There is usually no water drafting required and no drilling is permitted in the wetted channel.

Caltrans proposes to implement the following activities as needed and adhere to project specific criteria described below:

a. Drilling performed within 200 feet of any watercourse, channel or drainage ditch when water is present.
b. All other non-drilling activities related to and necessary to complete these types of projects, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. Heavy equipment must operate outside of the wetted channel and above the OHWL unless the channel is dry or if listed species are absent.
b. No drilling is permitted in the wetted channel.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Drilling performed within 200 feet of any watercourse, channel or drainage ditch when water is present.
b. All other non-drilling activities related to and necessary to complete these types of projects, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

<u>7. Grading of existing permanent, and establishment of new temporary access roads and traffic detours</u>

Caltrans proposes to establish new temporary roads, traffic detours and the grading of existing roads where construction activities necessitate the closure of an existing road or when access to infrastructure is required but cannot be achieved using existing roads. Typical grading and road construction activities include: (1) the disturbance of existing soil and debris using a shovel, dozer or grader, (2) the movement of gravel and debris from the areas, and (3) leveling, reshaping, and smoothing of the road surface. These activities are typically accomplished using heavy equipment with an attached bucket or blade. Temporary roads are typically comprised of

crushed rock or concrete and are outsloped for maximum water drainage. Crushed rock or concrete is typically used as an overlay as well to provide a smooth road surface and minimize dust. Road construction may also involve the building of water bars, ditches, deflectors and drainage dips to assist in drainage and maintain road integrity. When temporary roads are no longer needed, they are typically seeded with a mix of native plants and returned to their pre-project contour wherever possible.

The following activities will be performed as needed and adhere to specific project criteria listed below:

a. Grading of permanent access roads and construction of temporary access roads and traffic detours.
b. All other activities related to establishment and maintenance of temporary access roads and traffic detours, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. New access roads must be above the OHWL, must not enter a wetted channel or watercourse, and cannot cross a wetted channel.
b. Heavy equipment must operate outside of the wetted channel and OHWL unless the channel is dry or listed species are absent.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Grading or ground disturbance, associated with construction of temporary access roads, within 150 feet of any watercourse.

8. Construction of Settling Basins

Caltrans proposes to construct settling basins, where necessary, to provide on-site water and pollution management during and after construction activities. A settling basin is a temporary or permanent basin formed by excavating and/or constructing an embankment so that sediment-laden runoff is temporarily detained, allowing sediment to settle out before the runoff is discharged into adjacent areas. Typically, settling basins are considered for use on projects: (1) with disturbed areas during the rainy season, (2) where sediment-laden water may enter the drainage system or watercourses, (3) where post construction detention basins are required, (4) associated with dikes, temporary channels, and pipes to convey runoff from disturbed areas; or (5) at outlets of disturbed soil areas. A typical temporary settling basin has a design life of 12 to 28 months and will be maintained until the site is permanently protected against erosion or a permanent detention basin is constructed.

The following activities will be performed as needed and adhere to specific project criteria listed below:

a. Construction of settling basins that adhere to specific criteria detailed below.

b. All other activities related to the construction of settling basins, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. All settling basins will be constructed in conjunction with erosion control BMPs to minimize the amount of sediment flowing into the basin.
b. The length of the basin must be more than twice the width of the basin, and the depth must be no less than 3 feet.
c. Settling basins will also require features to accommodate overflow or bypass flows that exceed the storm event that the basin was designed to withstand. See Caltrans 2003 for a complete list of design requirements for temporary settling basins.

No post-project reporting is required for this type of activity.

9. Installation of Rock Slope Protection/erosion control materials

The following activities will be performed as needed:

a. Installation of RSP at the outlet or wing walls of existing culverts, in non-fish bearing streams, where there is no evidence of historic or current presence, and critical habitat has not been designated.

Caltrans proposes to perform post project reporting on all types of these projects.B. Best Management Practices

Caltrans proposes to implement appropriate BMPs at all sites. BMPs are effective, practical, structural or nonstructural methods that prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or that otherwise protect water quality and beneficial uses from potential degradation. BMPs will be applied to projects involving: (1) erosion control, (2) waste, water or material management; (3) water conveyance, (4) hydroseeding and handseeding, (5) material delivery, storage, and use; (6) paving operations, (7) vegetation management and preservation, (8) spill prevention and control, (9) stockpile management, (10) streambank stabilization, (11) structure demolition, (12) vehicle and equipment cleaning, maintenance, and refueling, and (13) water conservation practices. A complete list of potential BMPs are listed in Appendix C of the 2010 Programmatic Biological Assessment (Caltrans 2010), the Caltrans Storm Water Quality Handbook Maintenance Staff Guide (Caltrans 2003), and the Caltrans Storm Water Quality Handbook Construction Site Best Management Practices Manual (Caltrans 2003a). Caltrans has the flexibility to choose the most appropriate BMP for each site and will maintain all BMPs to function in their intended manner. ABMPs as described in the Programmatic Biological Assessment (Caltrans 2010) will be implemented where necessary, as determined by Caltrans staff. A complete list of these ABMPs can be found in the Appendix C of the Programmatic Biological Assessment (Caltrans 2010).

C. General Design Criteria common to all activities

Caltrans proposes to adhere to the following general design criteria, where applicable, for all projects that are part of this program:

a. Downed trees and logs suitable for restoration activities will be retained on site for future use in restoration projects. If they cannot be retained on site, Caltrans will stockpile usable trees at an appropriate facility for future use. If the storage area becomes full or if Caltrans has no location available for storage, then the removed trees can be given to the contractor or disposed of in other appropriate ways. Efforts will be made to make the wood available for restoration activities whenever feasible.

b. Dry season work windows for activities not involving cleaning or debris removal:

June 15 to October 15

c. The general in-water construction season can be extended to November 15 pending appropriate dry weather conditions and stream flows. Extensions will be initiated on an as needed basis. To grant an extension, Caltrans must contact NMFS and provide information regarding the purpose and need of the extension, and a proposed schedule for activities to be performed during this time.

d. Where available, Caltrans will use existing ingress and egress points, or perform work from the top of the stream banks.

e. Any vegetated area which is temporarily disturbed during construction within designated critical habitat will be replanted with native plants. Areas along stream banks will be restored and maintained with native riparian vegetation. All areas left bare as a result of construction activities will be restored to a natural state through replanting, or other means with native trees, shrubs, sterile plants, grasses, or some combination thereof. No exotic plants will be used.

f. Any disturbed ground must receive appropriate erosion control treatment (*e.g.*, mulching, seeding, planting) prior to the end of the construction season, prior to a cessation of operations due to forecasted wet weather, within seven days of project completion, or during the appropriate planting season. Maintenance will use all practicable techniques to prevent sediment from entering any water body.

g. Erosion control measures will be in place at all times during construction activities, particularly in areas where rainfall is expected or predicted during the construction season. Erosion control structures will be maintained throughout, and after construction activities. Sediment will be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 0.5 feet. Settling basins will be maintained so that no more than 0.25 feet of sediment depth accumulates within traps or sumps.

h. Adequate erosion control supplies and tools (*e.g.*, gravel, straw bales, shovels) will be kept onsite during all activities to ensure that supplies are available at all times to prevent materials from entering water bodies.

i. Equipment must be checked daily, prior to use, for leaks. Equipment cannot be used until leak is fixed. Prior to use, all equipment must be cleaned to remove external oil, grease, dirt or mud. Wash sites must be located at least 100 feet from any wetted channel and not be hydrologically connected.

j. Refueling must be done outside of the active channel and 50 feet above the OHWL at all sites.

k. A spill prevention plan must be developed before covered activities can begin, and must be kept on site during all times.

l. Placement of concrete and concrete slurry must be done in a dry area, within a cofferdam.

m. Application of materials such as asphalt, concrete and other construction materials must be done during the appropriate work windows. Petroleum products, chemicals, fresh cement, or water contaminated by the aforementioned will not be allowed to enter flowing water. Caltrans must have a spill prevention and management plan on site for all projects where material management is necessary.

n. Caltrans will supply NMFS with a copy of the culvert evaluation summary that is generated by the maintenance crews each fall.

IV. PROGRAM ADMINISTRATION

A. Reporting

Caltrans proposes to comply with the following reporting requirements set forth under this consultation: (1) identify projects with post project reporting requirements, (2) complete a post-project reporting form (PPRF) for each project that has a reporting requirement, (3) compile all PPRFs, and (4) prior to October 1 submit an electronic and hard copy report to NMFS with the following information, where appropriate:

1. Name of employee/project manager for the project
2. Project location – County, road number, closest road mile marker, and stream name.
3. Activity category
4. Listed Species Present (Y or N), what species.
5. Date of initiation and date of completion
6. List of BMPs applied
7. Estimated amount of vegetation removed
8. Estimated amount of sediment and debris removed from channel
9. Type of Heavy equipment used
10. Heavy Equipment guidelines followed? Problems?

11. Location of cleaning activities (in the channel, out of the channel below OHWL, above OHWL)
12. Quantity of Trees Removed
13. Number of geotechnical test holes
14. Length of newly established temporary road
15. Width of newly established road
16. Length of grading for existing roads

For each district, Caltrans proposes to have the Caltrans field maintenance supervisor or a delegated crew member be responsible for completing the PPRF and provide the completed form to the Caltrans area superintendent. Caltrans will ensure that the forms will then be compiled by the Caltrans district maintenance manager and submitted to NMFS. It is the responsibility of all Caltrans staff using this consultation to obtain and maintain competence in interpreting and implementing the Program. Corrections to the program activities or reinitiation can be implemented at any time, and do not need to wait for the annual monitoring and evaluation meeting to be discussed.

B. Monitoring

Objectives

Caltrans proposes to monitor project implementation of project activities in order to ensure: (1) adherence to all criteria and requirements, (2) to monitor what is or is not being successfully implemented, (3) monitor BMP implementation, and (4) to identify areas of concern. The objectives of the monitoring are to answer the following questions:

1. Is Caltrans following the required criteria for each activity type as described in the consultation? Are they following all guidelines and criteria for size, quantity, and location of allowed activities?
2. Is Caltrans implementing the appropriate BMPs at each project site? Are BMPs being appropriately maintained in order to continue to adequately function?
3. Are BMPs having the intended effect and minimizing impacts?
4. Are there unanticipated effects to listed species and/or critical habitat that were not identified at the time of the consultation? If so, is reinitiation warranted?
5. Is Caltrans experiencing internal confusion or problems interpreting the criteria set forth?
6. Is it necessary to update the consultation to clarify criteria?
7. Is Caltrans working collaboratively with NMFS and other resource agencies to ensure that the consultation is implemented correctly?

Data Collection

Caltrans will collect all the data for this monitoring plan. Data collection will involve a field review/site visit on a selected number of projects involving the following measures:

1. A subset of the projects reported on in the annual report will be selected for site visit and field review. NMFS staff may assist in project selection and field review if time allows,

however, it is Caltrans responsibility to annually conduct all monitoring and reporting activities.

2. At least one project from each category will be visited during the field review. Multiple projects of the same type may be visited to adequately gauge implementation success. Caltrans will determine the number of projects necessary to achieve data collection objectives.

3. Caltrans proposes to invite NMFS to attend all monitoring meetings and give NMFS the opportunity to assist with field review and site selection. Caltrans will organize and lead the field review and is responsible for making sure that all necessary staff and personnel attend site reviews to ensure a complete review of the project is accomplished.

Results

At the end of the field reviews, Caltrans will compile the data and submit to NMFS a brief narrative documenting the results of the field review. This narrative will include: (1) a discussion of implementation successes, (2) identified problems and proposed solutions, and (3) proposed improvement to required criteria compliance. Project monitoring may be conducted concurrently or after the fact. Monitoring frequency will be reconsidered annually as part of the monitoring program.

C. General Administration

Caltrans proposes to implement the following general administration procedures for the program. NMFS and Caltrans will meet annually and more as needed, for the following purposes: (1) for annual review of covered projects; (2) to evaluate and discuss the effectiveness of the program in order to continue providing a streamlined process; (3) to ensure that activities authorized by the program continue to minimize adverse effects to listed species and critical habitat; and (4) to update procedures, BMPs, and project criteria, if necessary. Modifications to the program will be discussed and developed during these meetings. At any time, NMFS or Caltrans may revoke or revise this program if it is determined that it is not being implemented as intended, or if re-initiation of consultation is required.

D. Training

To assist Caltrans with achieving consistent administration and implementation of the program through all three districts, Caltrans proposes to give an annual training to maintenance and environmental staff that describes the activities covered by the consultation, information necessary for submittal of pre-project notification packages, and reporting and monitoring requirements. The Caltrans environmental senior and district maintenance manager in each district are responsible for coordinating and implementing the annual training about implementation of the program. The training will be presented by Caltrans staff, with NMFS staff in attendance to provide support if time and workload allow.

E. Elevation/Issue Resolution

Caltrans proposes that if an issue cannot be resolved between Caltrans and NMFS staff, the issue will be elevated to the management level. Managers and staff will then meet to document and discuss the issues, and will work together to come to an agreement. Issues should be elevated when consensus cannot be reached regarding the determination of effect severity; adequacy of avoidance, minimization, or mitigation measures; or issues related to the applicability of the LOC. In addition, questions about relevant laws, regulations, or policy may be elevated. If managers and staff cannot resolve the issue, then it will be raised to the next higher level (policy level).

V. ESA CONSULTATION

NMFS used the best available information, including project specific design criteria, and past consultations on similar activities when preparing this letter of concurrence. Potential effects from similar activities to the proposed action on critical habitat include: (1) increases in suspended sediment inputs and stream temperature; (2) sedimentation of redds and spawning gravels; (3) chemical contamination; (4) decreases in available riparian vegetation; (5) decreases in prey availability; (6) decreases in streambank stability; (7) loss of rearing, migratory, and spawning habitat; (8) decreases in habitat access; and (9) exposure to noise pollution. These impacts could in turn result in effects to individuals including: (1) decreased foraging ability; (2) internal injuries; (3) increases in disease transmission rates; (4) decreased fitness and viability; (5) mortality; and (6) decreased spawning success.

However, the proposed project design criteria include measures to avoid, minimize or reduce effects to insignificant or discountable levels. In addition, project review and monitoring is expected to provide information regarding adherence to project criteria implemented to avoid or minimize adverse effects. Annual reviews of the program will allow for an overall assessment of the program where applied across Caltrans Districts 1, 2 and 4.

a. Water Quality

Proposed maintenance activities all have the potential to cause sediment mobilization. Sediment transported to a stream channel may alter water quality by increasing turbidity and suspended sediment levels. Exposure to increased turbidity and suspended sediment are expected to be insignificant for adults because they occupy freshwater habitats in fall and winter months when ambient turbidity levels are already elevated and the small amount of mobilized sediment from project activities will not result in measurable increases. Juveniles exposed to the anticipated small increase in suspended sediments will likely use avoidance behavior to find habitat that contains suitable water quality.

To minimize the potential for sediment disturbance and delivery to a waterbody, erosion control BMPs will be utilized for each project, at each site, and may consist of silt fences, fiber rolls, straw wattles, or catchment basins that will prevent mobilized sediment from entering a stream channel. See Caltrans (2012) for a complete list of potential erosion control BMPs. Additionally, where feasible, Caltrans will revegetate sites to pre-project or better conditions,

thereby decreasing the potential for sediment mobilization. All BMPs will be maintained to ensure proper functioning. Any sediment delivered to the stream channel will likely be a small quantity and will be flushed downstream immediately, where it will be diluted. Turbidity from these events will likely be delivered to the wetted channel during the first few precipitation events, and turbidity levels will return to background levels within hours to days. Indirect effects include the potential for sediment to become mobilized during future precipitation events. However, the use of erosion control BMPs will reduce potential effects from these events to insignificant levels. Exposure to sediment mobilization and subsequent changes in water quality will be short term and are anticipated to be insignificant to both individual listed fishes and their critical habitat.

Riparian and upland vegetation may be removed during all implementation of the proposed action. Removal of vegetation may cause changes in water quality, changes in vegetation characteristics, and changes in quantities of allocthonous materials. There may also be a temporary decrease in food/prey availability while vegetation regrows. The surrounding areas that contain vegetation will continue to provide shade, food and prey resources and allochthonous materials while other vegetation grows back. Due to the relatively small amount of vegetation proposed for removal at each site, quick regeneration of removed material, and the existence of additional plants and trees to provide shade, the removal of vegetation will be minimal and therefore have an insignificant effect on essential features of critical habitat. Potential effects to individuals are described above. Changes in water quality and associated effects will be short term and last through one growing season, and juveniles will likely find other suitable areas for rearing during this time. Adults are not expected to be exposed to these impacts when occupying freshwater habitat during the fall and winter when water temperatures are lower, dissolved oxygen concentrations are suitable, and water flows are suitable for spawning activities.

b. Noise, Motion, and Vibration Disturbance

All maintenance and repair activities may require the use of heavy equipment. Noise, motion, and vibration disturbance produced by heavy equipment operation may occur at all sites where heavy equipment is operating. Potential effects to individuals include those listed above. Responses to these effects range from no change in behavior to movements that might displace fish from their normal locations (Slotte *et al.* 2004). Proposed maintenance activities are typically short term and may last no more than one day at each site. Where possible, Caltrans will use hand tools and other non-motorized equipment to perform activities, decreasing the potential for individuals to be exposed to noise disturbance. Exposure to individuals will be temporary, or individuals will be able to avoid exposure by temporarily relocating either upstream or downstream into adjacent suitable habitat. Once these activities cease, individuals will have the opportunity to recolonize the areas and environmental conditions relating to noise will return to pre-project conditions. Effects to critical habitat are expected to be insignificant.

c. Vegetation Removal

Vegetation removal may occur in association with all maintenance activities. A maximum of 10,000 sq. feet of vegetation per site can be removed at one time, and additional criteria for how

vegetation is removed will minimize exposure to potential effects. Covered activities involving vegetation removal may occur in the riparian zone, along stream banks vertically up to the OHWL, or in upland locations. Potential effects to critical habitat include decreased streambank stabilization, decreased cover and allocthonous material input, decreases in the input of food or prey, decreased shade, increased water temperature, and increased sediment mobilization. Effects to individuals may include decreased fitness, increased disease transmission rates from decreased water quality, and exposure to increased water temperatures that can cause stress and decreased viability. The closer to the wetted channel the vegetation is removed, the higher likelihood that individuals will be exposed to effects, however, most activities will be designed to avoid vegetation removal and will include the implementation of BMPs.

The potential for exposure will be insignificant given the utilization of BMPs and work will be performed mainly in the dry season. Juvenile over-wintering habitat, such as that associated with woody debris and rootwads may be reduced until riparian vegetation grows back, however, this effect will be insignificant because adjacent rearing habitat will exist in all areas and be available for use. Juveniles will likely use avoidance behavior to find suitable habitat that is not been impacted and contains adequate refuge from high velocities. In the event that streamside riparian vegetation needs to be removed, the loss of riparian vegetation is expected to be small, and limited to mostly shrubs and willows which are generally faster to recover or reestablish than hardwoods or conifers. Willows and other riparian vegetation regenerate quickly, and will provide soil stabilization and begin to intercept runoff within one growing season. Effects to over-wintering habitat will be insignificant because most velocity refuge areas and long term large woody debris jams are comprised of larger, coniferous tree species.

Caltrans will implement a re-vegetation plan at all sites, and this is expected to further minimize the temporary loss of vegetation. Projects involving vegetation disturbance will have an insignificant effect from the cutting of trees and vegetation as no vegetation will be permanently removed. Where possible, only limbs and other overhanging parts will be removed, leaving behind additional shrubs and vegetation. These materials will continue to provide ground cover and future recruitment for large woody debris jams and over-wintering habitat features. Limbs and branches will likely be left on site and will continue to provide sediment and runoff interception, and provide ground cover. Therefore, NMFS does not anticipate adverse effects to listed species from the removal of riparian and upland vegetation associated with project implementation.

d. Chemical Contamination

Equipment refueling, fluid leaks and maintenance activities within and near the stream channel pose some risk of exposure to contamination. These activities will likely take place as part of larger projects described in category A. In addition to toxic chemicals associated with construction equipment, water that comes into contact with wet cement during construction can also adversely affect water quality and cause potential take of listed salmonids. Potential effects to listed species include: decreased fitness, increased occurrence of mortality, decreased water quality, and inability to use the area due to contamination. All projects will include the BMP measures outlined in the 2010 Programmatic Biological Assessment (Caltrans 2010), the Caltrans Storm Water Quality Handbook Maintenance Staff Guide (Caltrans 2003), and the

Caltrans Storm Water Quality Handbook Construction Site Best Management Practices Manual (Caltrans 2003a). Utilization of the BMPs will prevent contaminated sediment and water from entering adjacent watercourses. Therefore, water quality degradation from toxic chemicals associated with maintenance and construction activities will be discountable.

e. ESA Determination

Based on the information provided by Caltrans, NMFS agrees that the above described portions of Caltrans' routine maintenance and repair program may affect, but is not likely to adversely affect the listed species or designated critical habitat identified in Section 1. Reinitiation of consultation may be necessary where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) 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, (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered, or (3) a new species is listed or critical habitat designated that may be affected by the action.

VI. EFH CONSULTATION

The Pacific Fishery Management Council has delineated EFH for Pacific Coast salmon, Groundfish, and Coastal Pelagic species, which includes many areas where the program will take place. NMFS has evaluated the program for potential adverse effects to EFH pursuant to section 305(b)(2) of the MSFCA. Under the EFH implementing regulations [50 C.F.R. 600.810(a)], the term "adverse effect" is defined as "any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce quantity and/or quality of EFH." NMFS determined that the program would adversely affect EFH. Effects to EFH include: (1) decreases in soil stability; (2) decreases in water quality; (3) decreases in prey availability; (4) loss of complex cover; (5) decreases in riparian vegetation and allocthonous materials; and (6) sedimentation of spawning gravels.

The proposed project contains measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. The implementation of BMPs and adherence to specific project criteria that limits the size and scope of projects will minimize effects to EFH and listed species. NMFS has no additional measures to provide as EFH conservation recommendations. Pursuant to 50 CFR § 600.920(l), Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH.

VII. FWCA CONSULTATION

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. § 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose,

including navigation and drainage [16 U.S.C. § 662(a)]. Consistent with this consultation requirement, NMFS may provide recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and the MSFCMA. NMFS has no additional recommendations under the FWCA as the Project, as proposed, will not affect the conservation of fish species or their habitats.

Please contact Mrs. L. Kasey Sirkin at (707) 825-1620, or via email at kasey.sirkin@noaa.gov, if you have any questions regarding these consultations.

Sincerely,

for Jim Lecornarsino

Rodney R. McInnis
Regional Administrator

CC: Copy to file 151422SWR2011AR00495

References

California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbook, Maintenance Staff Guide.

California Department of Transportation (Caltrans). 2003a. Caltrans Storm Water Quality Handbook, Construction Site Best Management Practices Manual. 257 pp.

California Department of Transportation (Caltrans). 2010. Programmatic Authorization for Caltrans' Routine Maintenance and Repair Activities in Districts 1, 2, and 4 NMFS Programmatic Biological Assessment.

National Marine Fisheries Service (NMFS). 2001. Water Drafting Specifications, National Marine Fisheries Service, Southwest Region, August 2001, 4 pp.

Slotte, A., Hansen, K., Dalen, J., and One, E. 2004. Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. Fish. Res. 67: 143-150.

Enclosure 4

CATEGORY 3: NOTIFICATION FORM

Project biologist and contact information:

Name: _____Email: _____Phone: ( ) _____-_____

Project name

_____

Location (District, County, Route, Post Mile)

_____

Watershed: _____ Stream name: _____

Schedule

Start (day-month-year): ____-____-____ End: ____-____-____

For multi-season projects please provide construction scenario as best possible:

_____

_____

_____

Project and Affected Area description and proposed passage improvement (if applicable):

Culvert/bridge replacement (y/n)? ____ Culvert/bridge retrofit (y/n)? ____

Fish present (y/n) ____ Fish bearing (y/n)? ____ Perennial (y/n)? ____ Fish passage barrier (y/n)? ___

Freshwater habitat (y/n)? ____ (for non-freshwater habitat, separate EFH consultation required)

_____

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_____

_____

Map/photo/image showing project Affected Area attached (y/n)? ____

Species Impacts Table (per District and current Calendar Year)

Covered Species	**Number of Completed and Ongoing Projects to Date Involving Listed Fish Handling**	**Total Number of Fish Handled (h) and Mortality (m) to Date**	**Estimated Number of Fish Handling and Mortality (mortality=handling*0.04) of Proposed Project**	**Combined Handling and Mortality (To Date + Estimated)**
Fish		h/m	h/m	h/m
Chinook Salmon				
California Coastal ESU		/	/	/
Coho Salmon				
Central California Coast ESU		/	/	/
Southern Oregon/Northern California Coastal ESU		/	/	/
Steelhead				
Northern California DPS		/	/	/
Central California Coast DPS		/	/	/
South Central California Coast DPS		/	/	/

Habitat Impacts Table

Covered Species	**Critical Habitat Present in Affected Area yes/no/unknown(y/n/u)**	**Species in Watershed or Drainage (y/n/u)**	**Species in Affected Area During Project Implementation (y/n/u)**	**Permanent Habitat Removal (acres/ft^2)**	**Temporary Habitat Removal (acres/ft^2)**
Fish					
Eulachon					
Southern DPS					
Chinook Salmon					
California Coastal ESU					
Sacramento River Winter-Run ESU					
Central Valley Spring-Run ESU					
Coho Salmon					
Central California Coast ESU					
Southern Oregon/Northern California Coastal ESU					
Steelhead					
Northern California DPS					
Central California Coast DPS					
Southern Central California Coast DPS					
California Central Valley DPS					
Green Sturgeon					
Southern DPS					

Specific Actions Checklist

Check to indicate proposed action and associated ABMPs (described in detail in Caltrans PBA 2010)

___ **PA-1:** Operate construction equipment and vehicles (ABMP-1.1, 1.2, 1.3, and 1.4)
___ **PA-2:** Use temporary lighting for night construction activities (ABMP-2.1, 2.2, and 2.3)
___ **PA-3:** Maintain and fuel construction equipment and vehicles (ABMP-1.2, 1.3, 1.4, and 3.1)
___ **PA-4:** Clean the roadway of sediment and debris from landslide, flood events, and Construction (ABMP-5.1)
___ **PA-5:** Temporarily and permanently store sediment and debris, and pavement, petroleum products, concrete, and other construction materials (ABMP-1.4 and 5.1)
___ **PA-6:** Apply pavement, petroleum products, concrete, and other construction materials to surface of roads, bridges, and related infrastructure (ABMP-1.4 and 6.1)
___ **PA-7:** Treat and discharge water conveyed from the construction area (ABMP-7.1 and 7.2)
___ **PA-8:** Use drill rigs and drilling lubricants (ABMP-1.4, 8.1, 8.2, 8.3, and 8.4)
___ **PA-9:** Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure (ABMP-1.4 and 6.1)
___ **PA-10:** Remove and disturb upland, riparian, and wetland vegetation (ABMP-1.4, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, and 10.8)
___ **PA-11:** Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment (ABMP-1.4, 10.4, 10.7, 10.8, 11.1, 11.2, 11.3, and 11.4)
___ **PA-12:** Construct temporary sediment-settling basins (ABMP-10.4, 10.7, 10.8, and 12.1)
___ **PA-13:** Grade temporary access roads, traffic detours, and staging and work areas (ABMP-10.4, 10.7, 10.8, and 13.1)
___ **PA-14:** Operate construction equipment and vehicles in the stream channel (ABMP-10.4, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, and 14.8)
___ **PA-15:** Construct temporary stream crossings (ABMP-10.4, 10.8, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 15.1, and 15.2)
___ **PA-16:** Remove and disturb aquatic vegetation, stream sediment, and LWD (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.2, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, and 16.9)
___ **PA-17:** Install temporary cofferdams and diversion cofferdams (ABMP-10.4, 14.5, 14.6, 14.7, 15.1, 15.2, 17.1, 17.2, and 17.3)
___ **PA-18:** Temporarily redirect stream flow (ABMP-7.2, 10.4, 14.5, 14.6, 14.7, 15.1, 18.1, 18.2, 18.3, 18.4, 18.5, and 18.6)
___ **PA-19:** Temporarily draft water from streams and other water bodies (ABMP-14.5 and 18.6)
___ **PA-20:** Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.1, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, and 20.7)
___ **PA-21:** Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications (ABMP-1.4 and 21.1)
___ **PA-22:** Remove culverts (ABMP-10.4, 14.1, 14.5, 14.6, and 15.1)
___ **PA-23:** Clean, retrofit, or install culverts (ABMP-10.4, 14.1, 14.5, 14.6, 14.7, 15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, and 23.1)
___ **PA-25:** Remove existing bridge structure, including footings, piers, and piles (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, and 15.1)
___ **PA-26:** Install bridge structures, excluding pile-driving (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, 14.7,

15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, 23.1, and 23.3)
___ **PA-28:** Capture, handle, exclude, salvage, and relocate listed species (ABMP-28.1 through 28.12)
___ **PA-29:** Implement BMPs (ABMP-29.1 through 29.7)
___ **PA-30:** Mitigation framework for potential adverse impacts on species listed under CESA

Program limits and minimization measures checklist

(described in detail in NMFS PBO 2013)

a. Cleaning

Will cleaning require dewatering or fish relocation (y/n)? ___
(If yes, see *Section e. Dewatering and Fish Relocation* below)

b. Vegetation and LWD Management

Will the project require vegetation removal (y/n)? ____ Area (feet^2/acres) _____
Will the proposed project occur within 150 linear feet of the OHWL (y/n)? ____
(If yes, no more than 5,000 feet^2 or 0.12 acres of riparian or wetland/aquatic vegetation may be removed in the Program)

Will vegetation within 300 feet of any water body be removed (y/n)? ____
Will trees within 300 feet of any water body be removed (y/n)? ____number: >6 inches____
>12 inches____>18inches____>24inches____
Tree species to be removed: _____

c. Grading for Access Roads and Construction of Settling Basins and Storage Areas

Will proposed grading and establishment of staging and storage areas occur within 150 feet of any watercourse (y/n)? ____ Area (feet^2/acres) _____

d. Installation of Rock Slope Protection/erosion control materials

Does the proposed bank stabilization project involve a bridge, slip out, or other large roadway stabilization (y/n)? ____
Linear feet of stream bank proposed for stabilization? right bank ____ left bank ____
(No more than 150 linear feet per stream bank may be installed in the Program)

Does the proposed bank stabilization project involve a culvert (y/n)? ____
Linear feet of stream bank proposed for stabilization? right bank ____ left bank ____
(No more than 50 linear feet per stream bank may be installed at either the outlet side or inlet side as part of a culvert project in the Program)

e. Drilling Geotechnical Test Holes

Will drilling occur in the wetted channel (y/n)? ____

Proposed number of holes and specific location

_____

f. Dewatering and Fish Relocation

Will the proposed project involve dewatering (y/n)? ____ linear feet of stream dewatered ____
(See *Species Impacts Table* above)

g. Rehabilitation, Retrofit, and Repair of Culverts and Bridges

Does the project involve channel modification (defined as directly and/or indirectly modifying and/or permanently degrading natural channel forming processes and morphology of perennial, intermittent and ephemeral streams, and estuarine habitats) (y/n)? ____
If yes, describe below why total replacement and/or removal of the facility is infeasible or unreasonable

_____
_____
_____
_____

Do proposed rehabilitation, retrofit, and repair activities involve fish passage structures (y/n)? ____

Additional information attached (designs, images, geotechnical reports, etc.) (y/n)? ____

h. Replacement of Culverts and Bridges

Is RSP or similar protection structures proposed for in-channel piers (y/n)? ____
If yes, will the structures cause aggradation or degradation to a level that will adversely affect geomorphic processes and fish passage through the design life of the facility (if yes, the project is not approved)?

Replacement in confined channels: Are bridge abutments or culvert walls outside of the active channel and at a position that does not affect a stage change of more than 0.5 feet above what would occur in a channel with natural grade and no artificial confinements at Q_{20}) (y/n)? ___

Replacement in alluvial channels: Is culvert or bridge width equal to or greater than the CMZ width for design life of the facility (y/n)? ____

If no to the applicable design target, provide alternative design targets and description of how the facility will not cause aggradation or degradation to a level that will adversely affect geomorphic processes and fish passage through the design life of the facility

_____
_____
_____
_____

Additional information attached (designs, images, geotechnical reports, etc.) (y/n)? ____

Additional Questions/Comments

Will the project create new impervious surface (y/n)? ____ Area (feet^2/acres) _____
Will wetlands be impacted (y/n)? ____ Area (feet^2/acres) _____
Will the project involve activities that will result in the permanent loss/gain or modification of designated critical habitat (as defined by NMFS) (y/n)? ____
If yes, describe how much, what type, impact mechanism, and to what extent the habitat would be lost/gained or modified for each species affected

_____
_____
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Does the project involve revegetation (hydroseeding, shrub or tree plantings, etc.) (y/n)? ____
Will trees or shrubs be planted (y/n)? ____
If yes to either, briefly describe below

_____
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_____

CATEGORY 3 : POST-PROJECT REPORTING FORM

Project biologist and contact information:

Name: _____Email: _____Phone: ( ) _____-_____

Project name

_____

Location (District, County, Route, Post Mile)

_____

Watershed: _____ Stream name: _____

Schedule

Start (day-month-year): ____-____-____ Completion: ____-____-____

Multi-season project schedule:

_____

_____

_____

Description of completed project, affected Area, and passage improvement (if applicable):

Culvert/bridge replacement (y/n)? ____ Culvert/bridge retrofit (y/n)? ____

Fish present (y/n) ____ Fish bearing (y/n)? ____ Perennial (y/n)? ____ Fish passage barrier (y/n)? ___

_____

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Map/photo/image showing completed project attached (y/n)? ___

Species Impacts Table (per District and current Calendar Year)

Covered Species	**Number of Completed and Ongoing Projects to Date Involving Listed Fish Handling**	**Current Project Fish Handling (h) and Mortality (m)**	**Total Fish Handling and Mortality (To Date + Current Project)**
Fish		h/m	h/m
Chinook Salmon			
California Coastal ESU		/	/
Coho Salmon			
Central California Coast ESU		/	/
Southern Oregon/Northern California Coastal ESU		/	/
Steelhead			
Northern California DPS		/	/
Central California Coast DPS		/	/
South Central California Coast DPS		/	/

Habitat Impacts Table

Covered Species	**Critical Habitat Present in Action Area (y/n)**	**Species in Watershed or Drainage (y/n)**	**Species in Action Area During Project Implementation (y/n)**	**Permanent Habitat Removal (acres/ft^2)**	**Temporary Habitat Removal (acres/ft^2)**
Fish					
Eulachon					
Southern DPS					
Chinook Salmon					
California Coastal ESU					
Sacramento River Winter-Run ESU					
Central Valley Spring-Run ESU					
Coho Salmon					
Central California Coast ESU					
Southern Oregon/Northern California Coastal ESU					
Steelhead					
Northern California DPS					
Central California Coast DPS					
Southern Central California Coast DPS					
California Central Valley DPS					
Green Sturgeon					
Southern DPS					

Specific Actions Checklist

Check to indicate implementation of action and associated ABMPs (described in detail in Caltrans PBA 2010 and NMFS 2013)

___ **PA-1:** Operate construction equipment and vehicles (ABMP-1.1, 1.2, 1.3, and 1.4)
___ **PA-2:** Use temporary lighting for night construction activities (ABMP-2.1, 2.2, and 2.3)
___ **PA-3:** Maintain and fuel construction equipment and vehicles (ABMP-1.2, 1.3, 1.4, and 3.1)
___ **PA-4:** Clean the roadway of sediment and debris from landslide, flood events, and Construction (ABMP-5.1)
___ **PA-5:** Temporarily and permanently store sediment and debris, and pavement, petroleum products, concrete, and other construction materials (ABMP-1.4 and 5.1)
___ **PA-6:** Apply pavement, petroleum products, concrete, and other construction materials to surface of roads, bridges, and related infrastructure (ABMP-1.4 and 6.1)
___ **PA-7:** Treat and discharge water conveyed from the construction area (ABMP-7.1 and 7.2)
___ **PA-8:** Use drill rigs and drilling lubricants (ABMP-1.4, 8.1, 8.2, 8.3, and 8.4)
___ **PA-9:** Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure (ABMP-1.4 and 6.1)
___ **PA-10:** Remove and disturb upland, riparian, and wetland vegetation (ABMP-1.4, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, and 10.8)
___ **PA-11:** Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment (ABMP-1.4, 10.4, 10.7, 10.8, 11.1, 11.2, 11.3, and 11.4)
___ **PA-12:** Construct temporary sediment-settling basins (ABMP-10.4, 10.7, 10.8, and 12.1)
___ **PA-13:** Grade temporary access roads, traffic detours, and staging and work areas (ABMP-10.4, 10.7, 10.8, and 13.1)
___ **PA-14:** Operate construction equipment and vehicles in the stream channel (ABMP-10.4, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, and 14.8)
___ **PA-15:** Construct temporary stream crossings (ABMP-10.4, 10.8, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 15.1, and 15.2)
___ **PA-16:** Remove and disturb aquatic vegetation, stream sediment, and LWD (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.2, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, and 16.9)
___ **PA-17:** Install temporary cofferdams and diversion cofferdams (ABMP-10.4, 14.5, 14.6, 14.7, 15.1, 15.2, 17.1, 17.2, and 17.3)
___ **PA-18:** Temporarily redirect stream flow (ABMP-7.2, 10.4, 14.5, 14.6, 14.7, 15.1, 18.1, 18.2, 18.3, 18.4, 18.5, and 18.6)
___ **PA-19:** Temporarily draft water from streams and other water bodies (ABMP-14.5 and 18.6)
___ **PA-20:** Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.1, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, and 20.7)
___ **PA-21:** Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications (ABMP-1.4 and 21.1)
___ **PA-22:** Remove culverts (ABMP-10.4, 14.1, 14.5, 14.6, and 15.1)
___ **PA-23:** Clean, retrofit, or install culverts (ABMP-10.4, 14.1, 14.5, 14.6, 14.7, 15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, and 23.1)
___ **PA-25:** Remove existing bridge structure, including footings, piers, and piles (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, and 15.1)

___ **PA-26:** Install bridge structures, excluding pile-driving (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, 14.7, 15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, 23.1, and 23.3)
___ **PA-28:** Capture, handle, exclude, salvage, and relocate listed species (ABMP-28.1 through 28.12)
___ **PA-29:** Implement BMPs (ABMP-29.1 through 29.7)
___ **PA-30:** Mitigation framework for potential adverse impacts on species listed under CESA

Program limits and minimization measures checklist

a. Cleaning

Did cleaning require dewatering or fish relocation (y/n)? ___
(If yes, see *Section f. Dewatering and Fish Relocation* below)

b. Vegetation and LWD Management

Did the project involve vegetation removal (y/n)? ____ Area (feet^2/acres) _____
Did the project occur within 150 linear feet of the OHWL (y/n)? ____
Vegetation within 300 feet of any water body removed (y/n)? ____
Trees within 300 feet of any water body removed (y/n)? ____number: >6 inches____
>12 inches____>18inches____>24inches____
Tree species removed: _____

c. Grading for Access Roads and Construction of Settling Basins and Storage Areas

Establishment of staging and storage areas within 150 feet of watercourse (y/n)? ____ Area (feet^2/acres) _____

d. Installation of Rock Slope Protection/erosion control materials

Final description of slope stabilization or erosion control
_____
_____
_____
_____
Additional information attached (final designs, images, etc.) (y/n)? ____

e. Drilling Geotechnical Test Holes

Did drilling occur in the wetted channel (y/n)? ____

Number of holes and specific location
_____

f. Dewatering and Fish Relocation

Dewatering (y/n)? ____ linear feet of stream dewatered ____
(See *Species Impacts Table* above)

g. Rehabilitation, Retrofit, and Repair of Culverts and Bridges

Final description of rehabilitation, retrofit, or repair of culvert or bridge

_____
_____
_____
_____

Additional information attached (final designs, images, etc.) (y/n)? ____

h. Replacement of Culverts and Bridges

Final description of culvert or bridge replacement

_____
_____
_____
_____

Additional information attached (final designs, images, etc.) (y/n)? ____

Additional Questions/Comments

New impervious surface created (y/n)? ____ Area (feet^2/acres) _____
Wetlands impacted (y/n)? ____ Area (feet^2/acres) _____
Permanent loss/gain or modification of designated critical habitat (as defined by NMFS) (y/n)? ____
If yes, describe how much, what type, impact mechanism, and to what extent the habitat was lost/gained or modified for each species affected

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_____

Did the project involve revegetation (hydroseeding, shrub or tree plantings, etc.) (y/n)? ____
Trees or shrubs be planted (y/n)? ____ If yes to either, briefly describe below

_____
_____
_____
_____
_____

CATEGORY 2: INVENTORY AND REPORTING FORM

Project lead and contact information:

Name: _____Email: _____Phone: ( ) _____-_____

Location (District, County, Route, Post Mile)

_____

Watershed: _____ Stream name: _____

Schedule
Start (day-month-year): ____-____-____ End: ____-____-____

Project type checklist

Check project type and fill associated field(s) below

____***Cleaning*** (removal of material below the OHWL with heavy equipment when all life stages of listed fish are absent)
Volume of material removed in cubic yards (*must be between 2 and 5 cubic yards*): ____

____***Vegetation and LWD Management*** (vegetation removal outside of the wetted channel within and 20 linear feet of a bridge or culvert with hand tools)
Area of vegetation removal within 150 linear feet of the OHWL in square feet (*must be below 5,000 square* feet): ____

____***Grading for Access Roads and Construction of Settling Basins and Storage Areas*** (grading above the OHWL and outside of wetted channels and designated critical habitat)
Graded area within 150 linear feet of OHWL in square feet (*must be below 5,000 square* feet): ____

____ ***Installation of erosion control materials*** (placement of erosion control materials in designated critical habitat and outside of the wetted channels)
Type of materials installed (*RSP, sheet piles, or retaining walls may not be placed designated critical habitat*) _____
_____

____ ***Drilling Geotechnical Test Holes*** (geotechnical drilling below the OHWL or within designated critical habitat)
Number of holes and specific location (*geotechnical drilling may not take place in wetted channels*) _____

____ ***Dewatering and Fish Relocation*** (dewatering and fish relocation outside anadromous waters or designated critical habitat)
List of fish species, approximate length, and approximate number handled (*listed fish may not be handled*) _____
_____
_____
_____

____ ***Rehabilitation, Retrofit, and Repair of Culverts and Bridges*** (rehabilitation, retrofit, or repair of culvert or bridge superstructures within anadromous waters or designated critical habitat)
List of structures rehabilitated, retrofitted, or repaired (*activities may not occur below the OHWL*) _____
_____

____ ***Replacement of Culverts and Bridges*** (replacement of culverts and bridges in non-fish bearing streams)
Brief description of culvert or bridge replacement _____
_____
_____

Herbst, Christopher@DOT

From: Joel Casagrande - NOAA Federal <joel.casagrande@noaa.gov>
Sent: Monday, July 13, 2015 10:39 AM
To: Herbst, Christopher@DOT
Cc: States, Christopher@DOT
Subject: Re: I-80 Express Lanes - Pile Driving

Hi Chris,

The new liaison is Darren Howe. He can be reached at 707-575-3152, or darren.howe@noaa.gov

Thanks for the follow up and great to hear the programmatic is being used for this project.

Best,
Joel

On Mon, Jul 6, 2015 at 1:37 PM, Herbst, Christopher@DOT <christopher.herbst@dot.ca.gov> wrote:

> Hi Joel- I spoke with Chris States today and he mentioned there is a new NMFS contact for us in regards to this project (80 Express Lanes, EA 4G080). IF so could you please forward on any contact information? I'm coordinating with John Yeakel and others on utilizing the PBO as we've confirmed that no pile driving will be occurring and all foundations are CIDH.
>
> Thanks so much!
>
> -signed-
>
> **Chris Herbst**
>
> *Biologist*
>
> **CH2M**
>
> Mobile 703.728.1701
>
> Office 510.286.5231
>
> christopher.herbst@dot.ca.gov
>
> ---
>
> **From:** Joel Casagrande - NOAA Federal [mailto:joel.casagrande@noaa.gov]
> **Sent:** Tuesday, May 26, 2015 2:43 PM
> **To:** Herbst, Christopher@DOT
> **Cc:** States, Christopher@DOT; Yeakel, John@DOT
> **Subject:** Re: I-80 Express Lanes - Pile Driving

Hi Chris H., Chris S., and John,

Sounds good. Glad I asked. Often theAs long as the remaining portions of the project meet the criteria of the programmatic, I see no reason you can't use it. It is my understanding that you would need to confirm this with Melinda. Let me know how you want to proceed.

Thanks,
Joel

On Tue, May 26, 2015 at 10:24 AM, Herbst, Christopher@DOT <christopher.herbst@dot.ca.gov> wrote:

Joel-

I have an update for you regarding potential usage of the Programmatic BO for 80 Express Lanes project work over Horse and Ulatis creek (EA 4G080). After getting some additional details, the design team clarified the **no** pile driving will be occurring in either Horse or Ulatis creek. You can refer to page 8-9 (items #3 and #4 under Structure Widening) of the BA, that show that CIDH foundations will be used in these creeks which will require no pile driving.

Any other references to pile driving in the BA were just general descriptions of construction techniques used across any project. The Project Description includes the detailed narrative of actual construction for this project.

Thanks and let me know how we can proceed.

-signed-

Chris Herbst

Biologist

CH2M

Mobile 703.728.1701

Office 510.286.5231

christopher.herbst@dot.ca.gov

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Joel Casagrande

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