Chapter 1 Project Purpose and Need

1.1 Project Purpose

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing to seismically retrofit the existing State Route 255 Eureka Channel, Middle Channel, and Samoa Channel bridges, which span Humboldt Bay. The project purpose is to prevent bridge collapse and loss of lives in the event of a maximum credible earthquake (MCE) event (magnitude 7.5).

1.2 Project Background

See Exhibits 1 and 2 for project maps and Exhibits 3, 4, 5, and the exhibits in Appendix E for aerial photographs of the bridges. The three bridges are also often collectively known as the "Samoa Bridge" but will be referred to as the Humboldt Bay Bridges in this document. These bridges jointly link Route 101 and the City of Eureka to Woodley Island, Daby Island, Indian Island, and the Samoa Peninsula. (Note that Daby Island is devoid of development and is generally completely or near completely submerged during high tide conditions.) For a more detailed project description, see Chapter 2.

The City of Eureka and vicinity is the most populated area along the Humboldt County coast. The three State Route 255 bridges provide the only direct surface access to the City of Eureka, Woodley Island, and the Samoa Peninsula. Tourists, local businesses and residents, and commercial truck drivers rely on Route 255. Local entities view future regional economic opportunities tied to the Samoa Peninsula as well the recently completed Humboldt Bay deepening project.

1.3 Project Need

The project purpose and need is to prevent bridge collapse and loss of lives in the event of a maximum credible earthquake (MCE) event (magnitude 7.5). The proposed seismic retrofit of the three bridge substructures would meet the project purpose and need.

This document, an Environmental Assessment/Finding of No Significant Impact (EA/FONSI), addresses the potential environmental effects of the proposed Humboldt Bay Bridges seismic retrofit project in compliance with federal National Environmental Policy Act regulations. More specifically, the EA/FONSI also describes why the project is being proposed, alternative methods for constructing the project, the existing environment that could be affected by the project, potential impacts from each of the alternatives and measures to avoid or minimize harm. This document will not address the portions of each bridge above the columns, also called the superstructure, which were retrofitted in 1996.

Prior to this final EA/FONSI, a draft EA/FONSI was approved and publicly circulated to provide an opportunity for review and comment on the project and the environmental documentation. A summary of the public review and comment process of the draft environmental document is contained in Appendix A of this document.

The Humboldt Bay Bridges seismic retrofit project is statutorily exempt from the California Environmental Quality Act (CEQA). Senate Bill 805 amended Section 21080 B(4) of CEQA to include exempting seismic retrofit projects. However, Caltrans must still comply with other State environmental permits, laws, and regulations such as the California Endangered Species Act in order to construct this project. After both Caltrans and the FHWA approve the final environmental document, the following steps are necessary to proceed to project construction:

- Permits must be obtained from the following public agencies:

  U. S. Army Corps of Engineers
  Humboldt Bay Harbor Recreation and Conservation District
  California Coastal Commission (Coastal Development Permit)
  City of Eureka (Temporary Wastewater Discharge, Coastal Development and Encroachment permits)
  California Department of Fish and Game
  Regional Water Quality Control Board

- Additional approvals/agreements are required from the following agencies:

  U. S. Coast Guard
  U. S. Fish and Wildlife Service
  U. S. National Marine Fisheries Service

- California Transportation Commission must vote on the project funding;

- All required construction easements and agreements must be obtained.

Chapter 2 Description of Proposed Project and Alternatives Considered

2.1 Introduction

This chapter consists of a brief description of the existing State Route 255 Humboldt Bay Bridges followed by a detailed description of the proposed project. A project alternatives description follows. (See bridge terminology on page viii for definition of bridge terms used in the alternatives description.) These alternatives were initially considered but were withdrawn from consideration and reasons for their withdrawal are discussed. Only the proposed project and the No-Build Alternative are evaluated in detail in this document: based on meetings with resource agencies, the proposed project was determined to be the least environmentally harmful alternative that met the project purpose and need.

- **Eureka Channel Bridge (bridge number 04-230).** This 10-meters (34 feet) wide, 546-meters (1,820 feet) long, 15-meters (50-feet) high bridge links the Eureka waterfront and Woodley Island. The original structure was built in 1971 consisting of a combination box girder and I-girder superstructure. The bridge substructure consists of fourteen single concrete columns on footings supported by piles. Both bridge abutments are supported on concrete piles.

- **Middle Channel Bridge (bridge number 04-229).** This ten-meter (34-feet) wide, 324-meters (1,080-feet) long, twelve-meter (40-feet) high bridge links Woodley Island and Indian Island. The original structure was built in 1971. The nine span superstructure consists of a girder superstructure. The substructure consists of eight single reinforced concrete columns on footings supported by piles. Both bridge abutments are supported on concrete piles.

- **Samoa Channel Bridge (bridge number 04-228).** This ten-meter (34-feet) wide, 753-meters (2,510-feet) long, 17-meters (55-feet) high bridge links Indian Island and Samoa Peninsula. The original structure was built in 1971. The twenty span superstructure consists of girders and the substructure consists of nineteen single concrete columns on footings supported by piles. Both abutments are supported on concrete piles.

2.2 Detailed Project Description

The proposed project consists of seismically retrofitting the existing bridge substructure of the State Route 255 Eureka Channel, Middle Channel, and Samoa Channel bridges which collectively span Humboldt Bay. The estimated project cost is $27 million.

Every bridge column and corresponding bridge footing of the Eureka, Middle, and Samoa Channel Bridges are proposed to be strengthened. Exhibit C-1 is an example of an ex-

isting bridge pier and footing and Exhibit C-2 shows the same pier seismically retrofitted. Except for the northwest Eureka Channel Bridge abutment, the existing bridge abutments will not be strengthened on any of the bridges. The existing bridge superstructures (all bridge elements above the bridge columns such as the roadway and girders) are already retrofitted and no further superstructure retrofit work is proposed as part of this project.

At each bridge the existing seismic gates, along with the corresponding antenna towers, controller boxes, electronic signs, would be removed after construction. The existing seismic sensors on each bridge, which are currently connected to the seismic gates, would remain after substructure retrofit completion. A communication cable would be installed to link up the seismic sensors on each bridge. The 2.5 cm (1-inch) diameter cable would require trenching along the Route 255 roadway on Woodley Island.

Most of the proposed work will be confined to the existing State right-of-way. Approximately 7.6 ha (19 acres) of total additional temporary construction easement would be needed to construct the proposed project. Exhibits E-1, E-2, and E-3 are aerial photographs indicating existing right-of-way and proposed construction easements.

In 1998, Caltrans initially proposed a design to the public and public agencies with much larger footings, which was then the current bridge seismic retrofit design. In response to public agencies' concerns, a design in 1999 was developed that is substantially reduced in scale compared to the 1998 design. Consequently the revised design would have much less cost; excess material disposal quantity; and wetland, bay, and visual impacts. The 1999 design became the current proposed project and the 1998 design is now designated as Alternative 5 of alternatives dropped from consideration. (See Section 2.3 – Project Alternatives for more information.)

Details of the proposed retrofit for each individual bridge are listed below. See the exhibits in Appendix E for aerial photographs of each individual bridge. For an explanation of bridge terms used in this section, see the Bridge Terminology section at the beginning of this document.

<u>Eureka Channel Bridge</u> – Refer to Exhibits 6, 9, 10, and the exhibits in Appendix C.

1. Place reinforced concrete casings around each pier column. The new casings would be similar in appearance to the existing columns in terms of matching the existing column shape and material.

2. Four of the existing pier footings (labeled E-4, E-6, E-11, E-13 and E-14 in Exhibit 6) would be strengthened and enlarged; four 900-mm (three-foot) diameter steel pile shells would be driven in the channel bottom, excavated, and filled with concrete at each of the five pier footings.

3. Four of the existing pier pile caps (labeled E-7 through E-10 in Exhibit 6) would be strengthened and enlarged. Four 900-mm (three-foot) diameter steel shell piles would be driven into the channel bottom, excavated, and filled with reinforced concrete at each of the four pier footings.

4. Add 450-mm (1.5-foot) thick reinforced concrete top mat to each pier; the deep-water piers would have skirting placed to protect the piles and hide them from view at low tides. The skirtings would connect and match the existing skirtings. (See Exhibit C-3.)

5. At the northwest bridge abutment (labeled abut 16 in Exhibit 6) shear keys (concrete blocks) would be installed between the girders to prevent sideways movement and to support the bridge if the girders slip off the bridge abutment.

6. Fender piles around Piers E-7 and E-8 would be removed but not replaced because the Shell Oil Company no longer operates a barge fueling station northeast of the bridge. (A fender pile is shown in Exhibit 9.) The existing three red obstruction lights on the fender piles would also be removed. The existing navigation lights on the bridge superstructure will remain in place.

<u>Middle Channel Bridge</u> – Refer to Exhibits 7 and 11.

1. Place reinforced concrete casings around each pier column. The casings will match the existing column shape and material.

2. A pile cap would be placed at each of three pier footings (labeled M-2, M-8, and M-9 in Exhibit 7). Also, four 900 mm (three-foot) diameter steel shell piles would be driven, excavated, and filled with concrete at each of the three pier footings.

3. Strengthen and enlarge the existing pile cap at each of the five pier footings (labeled M-3 through M-7 in Exhibit 7) in the central portion of the channel. At each of these pier footings, four 900-mm (three-foot) diameter steel shell piles would be driven, excavated, and filled with reinforced concrete.

4. Add a 450-mm (1.5-foot) thick reinforced concrete top mat to each pier. (See Exhibit C-3.)

Samoa Channel Bridge – Refer to Exhibits 8 and 12.

1. Place reinforced concrete casings around each pier column. The casings will match the existing column shape and material.

2. Place piles and strengthen/enlarge the existing footing at each of the nine of the outer-most (closest to the abutments) pier footings (labeled S-2, S-3, and S-14 through S-20 in Exhibit 8). At each of the nine pier footings, four 900 mm (three-foot) diameter steel shell piles would be driven, excavated, and filled with reinforced concrete.

3. Strengthen and enlarge the existing pile caps at each of the eight of the pier footings in the central portion of the channel (labeled S-4 through S-7 and S-10 through S-13 in Exhibit 8). At piers S-8 and S-9, strengthen and enlarge the existing pile caps at each of the two pier footings. At all of the footing piers, four 1.5-meters (five-foot) diameter steel shell piles would be driven, excavated, and filled with reinforced concrete.

4. Add a 450-mm (1.5-foot) thick reinforced concrete top mat to each pier. (See Exhibit C-3.)

Construction Description

This section provides a general description of the proposed construction work. For an explanation of bridge terms used in this section, see Bridge Terminology section at the beginning of this document.

Temporary trestle structures would provide heavy equipment access to the bridge footings near land. (See Exhibits C-5 through C-8 in Appendix C for trestle diagrams; The exhibits in Appendix E indicate the proposed trestle locations on aerial photographs.) The exact dimensions of the trestle will be determined by the construction contractor, subject to approval by Caltrans, U.S. Coast Guard, and possibly the Humboldt Bay Harbor Recreation and Conservation District. Installing approximately 1,115 temporary trestle piles would be required to construct all of the trestle structures. All trestles will be removed in their entirety after construction is completed. Barges are expected for construction access at deep-water bridge footings to carry pile-driving cranes, drilling equipment, construction materials, and excavated material. Barges could be as large as 24-meters by 60-meters (80-feet by 200-feet) with multiple anchor lines up to 90-meters (300-feet) long for each barge.

After the bridge footings are accessed, de-watering the footings by placing cofferdams or de-watering devices around footings at, or near, shallow water would be required. (Cofferdams are shown in Exhibits C-5 through C-8.) A cofferdam is composed of steel sheet pilings driven into the ground to form a watertight structure around the existing bridge footings. The cofferdam not only prevents water from entering the work area, but it prevents excavated and drilled material from entering the open waters of the bay. The shallow water piers would require concrete seal courses within the cofferdams. After excavating within the cofferdams, the seal courses would be placed to allow de-watering the work area within the cofferdams. The land locked piers may require shoring, or cofferdams and concrete seal courses. After the seal courses and cofferdams are in place, the water would be pumped from the cofferdams.

Cofferdams and concrete seals will not be utilized for the Middle Channel Bridge piers or for the deep-water piers. At these locations, retrofit work would be accomplished with the use of pre-cast concrete skirting and cast in steel shell footing piles.

The actual retrofit work consists of excavating around the existing bridge footings and driving new footing piles around the ends of each exposed footing. Depending on the location, footing piles would be driven 12 to 36-meters (40 to 120-feet) below mean sea level and then excavated. Concrete would then be poured into tightly sealed forms containing reinforcing steel to "tie" the footing piles to each other and to the existing footing. Pile drivers, cranes, concrete mixers, drill rigs and other heavy equipment would be used to place the temporary trestles, coffer dams, new piles, steel reinforcing material, and concrete. Other construction equipment might include backhoes, generators, pumps, dump trucks, concrete trucks, excavators, pavers, rollers, boats, barges and hand power tools. The paver and rollers would be used to repave the public boat launch parking lot and portions of Waterfront Drive. (For more information see Chapter 3, Section 3.10 –

Marine Transportation.)

Excavation, disposal and construction methods will be similar for all three bridges. Construction activities are expected to generate up to 12,000 cubic meters (16,000 cubic yards) of excavated and drilled material. Most of this material will be stockpiled and then used as backfill. It is anticipated that approximately 3,800 m^3 (5,000 cubic yards) of this excavated material cannot be used as backfill. This material will be considered excess and will be transferred to one or more designated approved disposal sites.

Construction activity could be in progress concurrently at more than one bridge. It is anticipated that the proposed retrofit construction for all three bridges would require two to three years to complete.

Construction contractors require one or more staging areas for their operations involving heavy construction equipment and construction materials. In the case of this proposed project, the construction contractor would likely require a temporary, remote staging area with a dock on Humboldt Bay. Staging area activities generally include, but are not limited to, transferring and stockpiling material and construction equipment. These types of activities could be considered industrial/manufacturing activities. Most of the area west of Waterfront Drive between Del Norte and Commercial Streets is designated as Coastal Dependent Industrial by the City of Eureka. Within this industrial area there are commercial/industrial sites with docks along Humboldt Bay that could accommodate a staging area. Optional or mandatory staging areas are not part of this project and will not be identified or evaluated in this environmental document. It will be the contractor's responsibility to locate a staging area, if needed, as well as obtain any required environmental document and permit approvals for any staging areas.

2.3 Project Alternatives

After preliminary analyses, Caltrans, with guidance from several public agencies, determined that the proposed project was clearly the least environmentally damaging alternative that meets the project purpose and need as described in Chapter 1, Section 1.3. There are no apparent feasible alternatives to the project that would be less environmentally damaging and meet the project purpose and need. This section of the document will discuss the project alternatives process.

An engineering value analysis team completed a preliminary analysis of Humboldt Bay Bridges seismic retrofit strategies in July 1995. The value analysis team generated 14 possible solutions (e.g. replacing bridges) to the seismic issue of the bridges. Most of the 14 solutions were dropped after preliminary evaluation. In addition to the proposed project, preliminary plans for five alternatives, based on the initial 14 solutions, were developed and discussed in the following paragraphs. The team determined that there were no lower cost alternatives to retrofitting that would meet the project purpose and need. In September 1995, the State Office of Earthquake Engineering completed a risk assessment. A decision to fully retrofit all three bridges was made based on that assessment.

Caltrans considered the following five build alternatives before dropping them from consideration:

1. Replace Bridges. This alternative consists of replacing all three of the existing Humboldt Bay Bridges with totally new bridges. The advantages of this alternative would be to design bridges with standard width shoulders and it would be more visually proportional than if the bridges were seismically retrofitted. This alternative would substantially disrupt traffic during construction unless the bridges were constructed on a new alignment. This alternative would have substantially more environmental impacts than the retrofit option since the area of impact would be at least twice the area of the retrofit option. The future benefits that would be derived during the remaining expected life span of the existing three bridges would be eliminated if these bridges were replaced. The potential lost benefits would include the recent superstructure retrofit cost for all three bridges. The cost to replace all three bridges along the same alignment would be approximately $60.7 million. The cost to replace all three bridges along a parallel alignment would be approximately $63.8 million and the cost to demolish and remove the three existing bridges would exceed $5 million. The high total costs for either bridge replacement alternative would be prohibitive. In addition to the high costs, the environmental impacts would be substantial and consequently would likely encounter the most public opposition. Finally the added time to design, prepare environmental documentation, develop adequate mitigation for environmental effects, obtain permits, and build the replacement bridges would likely require twice the time to retrofit the existing bridges. The extended period to replace the bridges would unnecessarily prolong the safety risk on the existing bridges in the event of a major earthquake.

2. Combination of Retrofitting and Replacing Bridges. This alternative involves retrofitting the Eureka Channel Bridge and completely replacing the Middle Channel and Samoa Channel Bridges. The cost would range from approximately $50 to $55 million. The cost would be nearly twice the cost of the proposed project. This alternative was dropped from consideration because of the high cost and potential for substantial, unavoidable environmental impacts of replacing the Middle and Samoa Channel Bridges.

3. Retrofit Eureka Channel Bridge and Remove the Middle and Samoa Channel Bridges. This alternative involves retrofitting the existing Eureka Channel Bridge and removing the Middle Channel and Samoa Channel Bridges. The cost for this alternative would be approximately $14 million. This alternative is less costly of all of the build alternatives and would maintain access to Woodley Island. The life-cycle benefits of two of the three existing retrofitted bridge superstructures would not be realized. This alternative was dropped from consideration since it would not meet the project purpose and need because the roadway access between Eureka and Samoa Peninsula would be lost, resulting in substantial out of direction travel, and increased traffic congestion on Route 101. This alternative would likely result in substantial public controversy.

4. 1998 Substructure Seismic Retrofit Strategy. This alternative consists of retrofitting all three bridges. The proposed project was designed to replace this alternative because the overall impacts of this alternative would have been substantial. Although this alternative meets the project purpose and need, it was dropped from consideration for the following reasons:

- Substantial visual impact of large footings would be out of scale with existing structures;
- Required relocating the public boat launch under the Eureka Channel Bridge;
- Substantial permanent and temporary impacts to the bay channels: driving 684 footing piles would have been required (compared to 96 for the proposed project;
- Large volume of excess material to be disposed: 23,000 cubic meters (30,000 cubic yards); the resource agencies were concerned about how this material would have been handled/disposed;
- High cost: $50 to $60 Million.

5. Outrigger Seismic Retrofit. This alternative involves replacing the existing bridge columns and footings with "outrigger" type pairs of columns which laterally and perpendicularly extend beyond the bridge superstructure. This alternative would meet the project purpose and need and has advantages that are similar to the proposed project. In addition, unlike the proposed project, this alternative could adequately support future bridge widening. However this alternative would result in greater temporary and permanent bay wetland and tidal impacts because in addition to constructing completely new footings, the existing footings would need to be removed. For this reason, this alternative was dropped from further consideration.

No-Build

The No-Build Alternative is included in the Environmental Evaluation (Chapter 3) to describe the existing and future conditions if no further retrofit work is completed on the three Humboldt Bay Bridges. Selection of the No-Build Alternative would primarily involve periodic bridge inspections and routine maintenance and repair work as needed without any further seismic structural improvements. Under the No-Build Alternative scenario, the three bridges, as with any State highway structure, will remain open to public travel as long as they meet all safety standards.

In the event of a maximum credible earthquake (MCE), the bridges could experience multiple failures at structure joints and potentially collapse. The MCE in the Humboldt Bay region would be a 7.5 magnitude earthquake from the Little Salmon Fault. The superstructures of all three of the existing bridges were retrofitted, but without the substructure retrofit, each of the three bridges are still subject to collapse during a major seismic event. Because of this, the No-Build Alternative poses a greater possibility of loss of life occur-

ring during the remaining design life (at least fifty years) of the bridges. Seismically activated gates, similar to railroad crossing gates, are currently in operation at the ends of all three bridges and will function to deter motorists from crossing the bridges during or after a moderate or strong earthquake. The gates will not protect motorists already on the bridge during a seismic event. Although the gates improve safety, they do not meet the purpose and need of preventing bridge collapse.

If the bridges ever collapsed during a major earthquake, the rebuilding cost would greatly exceed the retrofit cost. In addition, removing large bridge structures from the bay would result in more environmental damage to the bay than the proposed retrofit work. Also, highway access to Woodley Island would be completely eliminated. Highway access to the Samoa Peninsula from Eureka would result in substantial delay and several miles of out of direction travel. Consequently, traffic would increase through Arcata, Manila, and on Route 101 between Eureka and Arcata.

Because this alternative does not meet the project purpose and need as mandated by the Governor of California in 1995, this alternative was dropped from further consideration.

Chapter 3 Environmental Setting, Project Effect Evaluation, and Measures to Minimize Harm

Introduction

Chapter 3 consists of a discussion of the environmental setting, potential project effects/impacts, and measures to minimize harm. The existing environmental setting consists of biological, historic, physical, and socio-economic features within, or near the project area that could be potentially affected by the proposed. A multi-disciplinary team of engineers and specialists worked together to follow a systematic procedure to identify, assess, and document the direct, indirect, individual, and cumulative effects of the proposed project. The team focused on first avoiding then minimizing project effects and developing measures to minimize any unavoidable project effects. Federal regulations require mitigation to the practicable extent feasible. This final environmental document and proposed project incorporates comments from public agencies and the public (see Appendix A).

Unless otherwise noted, the project limits or project area consists of the area, including open water, within 300-meters (1,000 feet) of the existing three bridges. Also unless otherwise noted, the three bridges are discussed collectively as the project. **Except where stated, the No-Build Alternative would not result in any environmental impacts.** As with the proposed project, only the proposed "action" (or "actions") of the No-Build Alternative is (are) evaluated for potential environmental effects. For the purposes of this environmental document, the No-Build Alternative would primarily involve periodic bridge inspections and routine maintenance and repair work. In some instances in this chapter, a general discussion of one or more of the bridges collapsing as a result of a major earthquake is discussed to provide context. However, neither the occurrence of a major earthquake or the possible decommissioning and removal of the existing bridges are proposed "actions" of the No-Build Alternative: consequently, the environmental evaluation does not discuss the impacts of these actions. Decommissioning or removing the existing bridges would require a separate environmental document.

The following studies were prepared and their findings are incorporated into this report:

Air Quality and Vibration Report
Noise Report
Hydrodynamic, Sedimentation, and Bridge Scour Analysis
Historic Property Survey Report (includes archaeology study)
Hazardous Waste/Toxic Materials Study (includes Preliminary Site Investigation)
Visual Assessment Study
Seismic Ground Motion Study
Natural Environment Study
Eelgrass Mitigation Plan
Value Analysis Study Report

These reports are available for public review at the Caltrans District 1 Office, Environmental Management Branch, 1656 Union Street, Eureka, CA 95501 (Call 707-441-5855 in advance to set up an appointment.)

3.1 Landform and Geology

Setting

The topography within the project limits is generally level. Humboldt Bay lies on a narrow coastal plain and is surrounded by terraces, steep mountains, and narrow valleys. For a description of the bay, see Section 3.3 - Hydrology and Floodplain.

The foundation material underlying the bridges is composed of alluvial sediments deposited during the Tertiary and Quaternary Periods (two to twelve million years ago). The uppermost deposits consists of nine to twelve-meters (thirty to forty-feet) of interbedded layers of soft to compact clay, mud, silt, and organic material from inter-tidal marshes. Underlying these deposits are silty sand layers, silty clay layers, clay deposits, fine sand, and gravel. The depth to bedrock within the channels ranges from approximately 300-meters (1,000-feet) to 600-meters (2,000-feet). (Source: Seismic Ground Motion Study for Humboldt Bay Bridges on Route 255 prepared by Geomatrix Consultants for Caltrans.)

The ground at the bridge abutments was substantially altered when the bridges were originally constructed. The Eureka Channel side of Woodley Island was excavated to build the footings. Large quantities of imported fill material were placed on Woodley and Indian Islands to form the foundation material for the bridge abutments and roadway.

Project Effects

Because the proposed construction work involves reinforcing existing bridges and not constructing new ones, the proposed project would require relatively minimal earthwork. Two temporary access roads, each approximately 15-meters (50-feet) wide and 60-meters (200-feet) long would need to be constructed on both sides of the Eureka Channel Bridge on the south side of Woodley Island.

During construction, there will be no unconfined excavation within the bay, except at four shallow water piers at the Eureka Channel Bridge. The placement of cofferdams around the bridge footings will confine turbidity (sediment stirred up in water) caused by pile driving and excavation at the footings. Excavation around the landlocked bridge footings would be required and may, or may not require cofferdams, depending on conditions. Construction activities are expected to generate up to 12,000 cubic meters (16,000 cubic yards) of excavated and drilled material. Most of this material will be stockpiled and then used as backfill. It is anticipated that approximately 3,800 m^3 (5,000 cubic yards) of this excavated material cannot be used as backfill. This material will be considered excess

and will be transferred to one or more designated approved disposal sites. The net removal of excavated bay material is not expected to substantially affect the bay bottom. (See Section 3.3 – Hydrology and Floodplain for more information.) The proposed project would not change the upland topography and, as such, would not affect upland slope stability within the project area. Other than possible grading for the access roads, there would be no grading or placement of earth-fill required for this project. The overall project effects are expected to be minor, localized, and temporary.

Measures to Minimize Harm

The proposed project was designed to minimize earthwork by retrofitting existing columns and footings. The two temporary construction access roads would be restored to original grade and re-vegetated. Other than installing temporary cofferdams and trestles to minimize excavation, measures to minimize harm are not required.

3.2 Seismicity

Setting

The Humboldt Bay Bridges are located in a seismically active area; it is an area of complex tectonic interaction among the Gorda, North American, and Pacific tectonic plates. The nearest major active fault zone is the Little Salmon Fault, approximately five km (three miles) away. The Little Salmon Fault has the potential to result in a 7.5 magnitude earthquake. The liquefaction potential is high because of the depth of unconsolidated material within each of the three channels. See the Earthquake Terminology section at the beginning of this document. (Source: Seismic Ground Motion Study for Humboldt Bay Bridges on Route 255, prepared by Geomatrix Consultants.)

A major earthquake can sometimes generate a seismic wave or tsunami. The Humboldt Bay Bridges would not be directly exposed to a tsunami, however the footings of the Eureka Channel Bridge are within the tsunami run-up zone.

Project Effects

The greatest seismic hazard to the proposed project would be associated with ground shaking from seismic activity. The project area will likely experience strong to very strong seismically induced ground shaking within the design life of the retrofitted bridges. Strong ground shaking can cause liquefaction under the bridge footings and abutments. Surface fault rupture and resulting displacement is not expected since there are no known faults crossing any of the bridges.

The largest tsunami ocean waves would not be expected to top the highest dunes separating the ocean and the Humboldt Bay. However, a tsunami wave could enter the Humboldt Bay mouth and result in a run-up at the south end of the Eureka Channel Bridge. A tsunami run-up might inundate part of the bridge but would not be expected to substantially damage the bridge.

Measures to Minimize Harm

Since each bridge is different in terms of size, setting, and design, each bridge was studied individually to develop appropriate retrofit strategies designed to withstand collapse during a maximum credible earthquake (MCE). The MCE in the Humboldt Bay region would be a 7.5 magnitude earthquake from the Little Salmon Fault. Exploratory soil borings within the channels, geological and seismic data, and structural foundation reports of the existing bridges formed the basis of the retrofit designs.

The proposed project would help to insure structural stability and minimize risks to life and property from a major earthquake (7.0 magnitude or higher). The proposed project would substantially reduce the possibility of any of the three bridges collapsing and posing a danger to motorists on the bridge compared to the No-Build Alternative during a MCE.

In the event of a major or maximum credible earthquake (MCE), the bridges will need to be closed for inspection immediately after a MCE to ensure public safety. It is possible that one or more of the three bridges would require extensive repair or complete replacement, possibly requiring long-term closure of one more of the bridges, depending on the extent of the damage.

No-Build Alternative. Under the No-Build Alternative, the existing Humboldt Bay Bridges would likely be able to withstand a moderate earthquake. However, it is anticipated that the bridges would experience multiple failures at structure joints and potential collapse in the event of a MCE. The superstructures of all three of the existing bridges were retrofitted but without the substructure retrofit, each of the three bridges are still subject to collapse during a major seismic event. Seismic gates, similar to railroad crossing gates, are currently in operation at the ends of all three bridges and will function to deter motorists from crossing the bridges during or after a moderate or strong earthquake. If the gates close as a result of an earthquake event, the bridges would be inspected for structural damage. Depending on the extent of the damage, the bridge(s) could be closed to traffic temporarily or permanently.

3.3 Hydrology and Floodplain

Setting

Humboldt Bay is the second largest estuary in California and consists of Arcata Bay to the north, the South Bay, and a central entrance bay connecting the two bays. The Bay is approximately 22 km (14 miles) long and 6.4 km (four miles) wide at its broadest location, covering approximately 6,400 ha or 16,000 acres (excluding tributary sloughs). The bay mouth has been improved with two jetties approximately 600-meters (2,000-feet) apart. The Eureka Channel (about one to four-meters or four to thirteen-feet deep), Middle Channel (about three to seven-meters or ten to 23-feet deep), and Samoa Channel (about three to fifteen-meters or nine to fifty-feet deep) collectively link Arcata Bay to the rest of the Humboldt Bay. Since 1891, human activities have substantially altered the bay water flow regime and sediment transport.

The tidal range of mean tides is approximately 1.2-meters (four-feet). The bay has extensive inter-tidal mud flats that are exposed at low tide and interlaced with numerous drainage channels, with over half the surface of the bay exposed at low tide. Most of Indian and Daby Islands are submerged during extreme high tides. The Samoa Channel drains about two-thirds of the Arcata Bay tidal volume resulting in relatively high velocities. In addition to periodic maintenance dredging, the U. S. Army Corps of Engineers recently completed an extensive deepening of the Humboldt entrance bay, southwest of the three Humboldt Bay Bridges.

Several watercourses drain into Humboldt Bay, which along with the tides, constantly affects the total volume of water in the bay. According to a 1986 Federal Emergency Management Agency map, all three Humboldt Bay Bridges are within a 100-year floodplain, except for the southern segment under the Eureka Channel Bridge and northwestern segment under the Samoa Channel Bridge.

A small (less than three-meter or ten-foot wide) ditch carrying tidal-influenced, brackish water crosses under the Samoa Channel Bridge and extends parallel between the railroad and Vance Avenue on the Samoa Peninsula. (See Exhibit 4 for location of ditch.)

A freshwater pond is located southwest of the Woodley Island interchange (see Exhibit 3). Although this pond is within 60-meters (200-feet) of the Eureka Channel Bridge, it is outside of the project construction area.

Project Effects

Construction activities are expected to generate up to 12,000 cubic meters (16,000 cubic yards) of excavated and drilled material. Most of this material will be stockpiled and then used as backfill. It is anticipated that approximately 3,800 m^3 (5,000 cubic yards) of this excavated material cannot be used as backfill. Project construction would involve constructing a temporary dock east of the Eureka Channel Bridge; placing temporary trestles adjacent to the existing bridges; and placing temporary cofferdams around most of the bridge footings in the bay. After project construction, the dock, all trestles, and cofferdams will be completely removed. Also after construction, six of the eight of the Eureka Channel Bridge pier footings and seven of the nineteen of the Samoa Channel Bridge pier footings

would be below the mudline or groundline. None of the Middle Channel footings would be below the mudline or groundline after construction.

The remaining two pier footings within the Eureka Channel would increase in length (parallel to the channel and tidal flow), approximately six-meters (21-feet), and height, approximately 450-mm (1.5-feet). After construction, the retrofitted footings would have no effect to the Eureka Channel between the bridge piers. The pile cap and skirting will extend approximately two-meters (6.5-feet) below the mean sea level elevation: the remaining foundation below this elevation consisting of round footing piles and water would pass through and around the individual footing piles.

The existing fender piles within the Eureka Channel would be removed (and not replaced) near bridge piers E-7 and E-8, which are adjacent to the main navigable channel. The fender pile removal would increase the width of the main navigable channel. A fender pile is shown in Exhibit 9.

Each of the three shallow water Middle Channel Bridge footings (at bridge piers M-2, M-8, M-9) would increase by about 400-mm (sixteen-inches) in width, and the existing footings would increase in length from approximately 4.8-meters (16-feet) to13.8-meters (46-feet). The other five above channel bottom footings would not change in width and would increase in length from 10.8-meters (36-feet) to 18.6-meters (62-feet).

Eight of the Samoa Channel Bridge footings that are above the channel bottom would not change in width but would increase in length from approximately 11.4-meters (38-feet) to 21-meters (70-feet). The remaining two footings above the channel bottom would not change in width but would increase in length from about 13.8-meters (46-feet) to 22.2-meters (74-feet). After construction, the retrofitted footings would have no effect to the Samoa Channel between the bridge piers.

For the footings above the channel bottom, only the existing and proposed footing piles would be exposed in the channels below the pile caps and skirting. The bay water would be able to pass around and between the existing and proposed pile footings below the pile caps and skirting.

Overall, the navigable channel widths at all three bridges would remain unchanged, except at two bridge piers in the Eureka Channel where the channel width would actually increase after the fender piles are removed. (See Chapter 2, Section 2.2 Detailed Project Description for more information regarding the fender piles.) The Middle Channel Bridge footings would increase in width, but only within shallow water portion of the channel.

WEST Consultants created a computer model of the entire Humboldt Bay to determine the potential project effects on the bay water hydraulics and sediment dynamics. Qualitatively, the project is not expected to impact either bay water circulation or sediment movement. The predicted post-construction tidal velocities showed almost no effect on the existing channel depths and tidal velocities. The difference in velocities was within ±0.045 meters/second (±0.15 feet/second). The difference in depths was within ± 0.018

meters (±0.06 feet). (Source: Hydrodynamic, Sedimentation and Bridge Scour Analysis of Samoa Channel, Middle Channel and Eureka Channel Bridges Humboldt Bay, California prepared by WEST Consultants.)

WEST Consultants also performed a cumulative effects analysis, focusing on the northern portion of Humboldt Bay from the year 1881 to the recent U.S. Army Corps of Engineers bay deepening project. Results from this analysis indicate the water velocity increase caused by the retrofitted bridges would be minimal, thus the cumulative impact on bay circulation would also be minimal.

Utilizing the findings of the previously mentioned WEST Consultants study, a location hydraulic study investigation determined the flooding risks associated with implementation of the proposed project would be infinitesimal. Also the project does not constitute a substantial floodplain encroachment. The results of the hydraulic study may be reviewed at the address listed at the beginning of Chapter 3.

It should be noted that WEST Consultants' model is based upon an earlier seismic retrofit design that has since been superseded. (See Alternative 5 in Section 2.3 – Project Alternatives for more information regarding the earlier retrofit design.) The retrofit design was substantially scaled back and the modeling results were re-evaluated with the current retrofit strategy. It was determined that the new retrofit design strategy would have even less of an effect on the Bay water circulation patterns, velocities, and sediment movement than the former strategy, which was deemed negligible.

The study results conclude that the project is expected to have minimal, or no effect on the bay bottom, sediment transport, sedimentation (accumulation of sediment settling), shoaling, or flooding.

Measures to Minimize Harm

The project effects are expected to be minimal and no measures to minimize harm are required.

3.4 Water Quality

Setting

As described in Section 3.3 – Hydrology and Floodplain, the bay is an estuary subject to ocean tides and several freshwater watercourses draining into the bay. The groundwater is assumed to be close to the surface at all bridge footings on land. The bay supports a diverse plant and animal community as described in Section 3.8 – Biological Resources. For information about possible hazardous materials/waste in the bay, see Section 3.5 – Hazardous Waste/Toxic Materials.

The 1993 North Coast Region Water Quality Control Plan, adopted by the California North Coast Regional Water Quality Control Board (RWQCB), lists 15 beneficial uses of the Humboldt Bay which are to be protected, including sport fishing, aquaculture, navigation, and wildlife habitat. Humboldt Bay is currently not included in the RWQCB's listing of waterbodies not meeting water quality standards. Consequently the prioritization of those waterbodies for waste reduction activities or Total Maximum Daily Loads (TMDLs) do not apply to Humboldt Bay.

Project Effects

The following project construction operations could affect water quality:

Excavation and Drilling. The project would require excavating and drilling at all shallow and deep-water bridge footings. The placement of cofferdams around shallow water bridge footings will confine turbidity (sediment stirred up in water) from any needed drilling and excavation. Approximately 7,600 square meters (82,000 square feet) of channel bottom would be disturbed within the cofferdams around each of the shallow and deep water bridge footings. Excavation around the landlocked bridge footings would be required and may, or may not, require cofferdams or shoring depending on groundwater conditions. Barges and temporary trestles for construction access at the deep water bridge footings in the bay channels will be utilized to minimize bay channel bottom disturbance. The barges are not expected to contact the channel bottom in the deep channels. (Note that barges would contact the channel bottom for work at the shallow water portion of the Eureka Channel at piers E-12 through E-15.) Temporary gravel causeways were considered in lieu of trestles but were determined to have a greater water quality impact than temporary trestles.

A temporary trestle for construction equipment will be constructed over a ditch to access Samoa Channel Bridge footings on the Samoa Peninsula. (For information regarding this ditch, see Section 3.3 – Hydrology and Floodplain.) A temporary cofferdam around one of the Samoa Channel Bridge footings would block the ditch flow during construction. However, a temporary pipe will be installed to maintain the ditch flow during construction.

Temporary trestle piles and coffer dams. Short-term effects on water quality would occur when the estimated 1,115 temporary trestle piles and nineteen cofferdams are installed and removed from the bay.

Unconfined or open excavation. Excavation entails the mechanical removal of bay channel bottom and upland earth material. During construction, there will be no unconfined excavation within the bay, except possibly at four shallow water Eureka Channel Bridge piers near Woodley Island. Instead of open excavation, cofferdams will be installed at most of the bridge footings to be retrofitted in order to isolate the bay water and mud. Because of the low vertical bridge clearance at the four shallow water piers, conventional cofferdams might not be possible to install; if so, unconfined excavation from a barge to

install de-watering structures (similar to cofferdams) around the bridge footings would be required. Approximately 3,260 square meters (35,090 square feet) of channel bottom might need to be excavated at these four shallow water piles. Caltrans is proposing to backfill the excavated area with original mud after work at the four shallow water piers is completed. Unconfined excavation and placement of backfill material are expected to have short-term effects to water quality.

Transferring, storing, backfilling, disposing excess material. Construction activities are expected to generate up to 12,000 cubic meters (16,000 cubic yards) of excavated and drilled material. Most of this material will be stockpiled and then used as backfill. It is anticipated that approximately 3,800 m^3 (5,000 cubic yards) of this excavated material cannot be used as backfill. This material will be considered excess and will be transferred to one or more designated approved disposal sites. Excavated and drilled bay material would be transported by some combination of disposal lines, barges, or trucks to a stockpile location. Water would then be separated from the excavated and drilled material. Potential accidental spillage could occur during transfer of drilled or excavated material which could result in short-term impacts to water quality. See Section 3.5 - Hazardous Waste/Toxic Materials for information regarding testing and possible special handling of excess material.

During the resource agency permit application process, and in consultation with resource agencies, water quality limitations will be established which will determine if separated water can return to the bay or dispose of it at an approved upland site. For separated water generated at the south end of the Eureka Channel Bridge, a determination would be made whether to discharge the water into the City of Eureka sewer system. The Eureka sewer connects to the treatment plant at the south end of the city and the treated effluent is eventually discharged into Humboldt Bay. A temporary on-site wastewater discharge permit from the City of Eureka will be required to discharge into the City sewer system. Water pumped from cofferdams may require testing and treatment before returning to the bay.

Wet cement and construction equipment fluids. Wet concrete or cement powder can be toxic to marine life. There is also the potential for spillage of petrochemical products such as diesel fuel, lubricants and hydraulic fluids for construction equipment. These materials all have some potential to enter the waters of the bay during construction.

Upland (above high tide) ground disturbance. Storm water runoff could occur from construction work areas and the construction of two temporary access roads is proposed on the southeast side of Woodley Island. The road construction would require an area of approximately 1,620 square meter (18,000 square feet). Placement of geotextile fabric and gravel on the access roads is expected to minimize erosion and siltation from storm-water run-off. After construction, the geotextile fabric and gravel will be removed from the access roads and any disturbed ground will be restored to the original grade.

Barges. Short-term effects on water quality (i.e., turbidity) could result when barges that carry excavation equipment are moved around the shallow water Eureka Channel Bridge

piers. Localized, short-term effects on water quality could also occur from placing and removing barge anchors.

Water quality factors that could be temporarily affected by the activities stated in this section include: total suspended solids (turbidity), dissolved oxygen, nutrients, pH, salinity, and temperature. Other than accidental spills of equipment fluids, the water quality effects from construction activities discussed in this section would be localized and short-term based on studies for the recent dredging in Humboldt Bay. (Source: Final Environmental Impact Statement/Report for the Humboldt Harbor and Bay Deepening Navigation Report prepared by the U. S. Army Corps of Engineers, 1995.)

Refer to Section 3.8 - Biological Resources for water turbidity effects and other project effects on aquatic life.

Measures to Minimize Harm

The National Pollutant Discharge Elimination System (NPDES) Program regulates the discharge of any pollutants to waters of the United States, under the Federal Water Pollution Control Act. The State Water Resources Control Board through its nine Regional Water Quality Control Boards implements the NPDES program in California. The proposed project will require an Individual NPDES permit to address issues of discharging separated water back into the bay during construction and potential erosion from storm-water run-off.

Any potential water quality and erosion effects from run-off are expected to be avoided or mitigated with the implementation of a Storm Water Pollution Prevention Plan (SWPPP) developed and approved prior to construction. The SWPPP will address all construction management practices that have the potential to impact water quality and will identify appropriate control measures to be taken by the construction contractor to minimize such potential impacts. The SWPPP will include Best Management Practices (BMPs) to be implemented to control and prevent the discharge of pollutants to surface waters as well as groundwater.

In order to minimize effects to the bay water quality during unconfined excavation and back filling work at the four shallow water Eureka Channel Bridge piers, turbidity barriers will be installed to contain the turbidity.

An on-site spill prevention and accidental spill response plan will be prepared and will be subject to the approval of the Regional Water Quality Control Board. The plan will include, but not be limited to, storage of clean-up/containment equipment and materials, designation of responsible individuals, and reporting protocols to the appropriate public and emergency services/agencies in the event of a spill, and contingency planning to allow for expeditious containment and cleanup of accidental spills.

After mitigation measures are implemented, there are no anticipated temporary or per-

manent impacts to the beneficial uses of Humboldt Bay. Groundwater is not expected to be substantially affected because upland excavation will only be required at the immediate area surrounding the land pier footings.

3.5 Hazardous Waste/Toxic Materials

Setting

At present, open space and open bay waters surround most of the bridge abutments and spans; but in the past 140 years the Eureka Waterfront and Samoa Peninsula were manufacturing or industrial areas. Many of these industrial activities operated with minimal or no regulations on the discharge of hazardous waste/toxic materials. Consequently, hazardous waste/toxic materials from these industrial activities may still be present within bay sediments, upland soils, and groundwater. The following is a list compiled during Phase 1 investigations of records, Caltrans Initial Site Assessment (ISA), of past industrial operations and activities that might have contributed hazardous waste/toxic materials within, or near, the project site; the list also includes possible chemicals and compounds that might have been generated by these potential sources:

Former area of Carson Mill southwest side of Eureka Channel Bridge: electrical transformers, gas and oil storage and automobile repair shop, and a refuse burner (polychlorinated biphenyls, hydrocarbons, metals). Groundwater-borne contamination (volatile organic compounds, petroleum) from unspecified sources;

Former area of Eureka/Acme Foundry adjacent to the southeast side of Eureka Channel Bridge: metals;

Eureka, Middle, and Samoa bay channels: storm drain and roadway runoff (petroleum, lead); contaminants from boats, ships, and boatyards (petroleum, bottom paints, preservatives, glues, lead based paint and lead bedding material); lumber and pulp mill preservatives, by-products (dioxin, pentachlorophenyl); agricultural runoff (pesticides, herbicides, dioxin) channels.

The proposed access and work area is not on the 1998 California *Hazardous Waste and Substances Site List* (formerly *Cortese List*). Also, records for the three bridges were examined and a field check verified that asbestos-containing material (ACM) is not within bridge parts to be affected by this project.

The Humboldt Bay Bridges were under construction from 1970 to 1971. The bridge construction required a large amount of excavation and local borrow material (fill). Consequently most of the material around the existing bridge footings has been previously dis-

turbed. At upland piers, fill materials introduced by construction of the bridge are from an unknown source and could have been infiltrated by contaminated materials transported by surface water drainage or groundwater.

With these considerations in mind, during a Phase 2 study or Preliminary Site Investigation (PSI), samples taken from the proposed work area were collected and tested for contamination. The results of laboratory analysis of upland soil and groundwater samples indicate metals and hydrocarbons at concentrations that necessitate further testing during construction to determine appropriate disposal options. In addition bay sediment samples were found to contain concentrations of arsenic that warrant testing and possibly special handling during construction. Samples from the two timber fender piles near the southwest segment of the Eureka Channel Bridge tested positive for semi-volatile organic compounds. The complete PSI report is available for review at the Caltrans District Office in Eureka.

Project Effects

There is a potential for encountering contaminated material during the following ground disturbing construction activities:

- Access road construction on the southeast side of Woodley Island;
- Unconfined excavation within the bay at four shallow water piles at the Eureka Channel Bridge near Woodley Island;
- Excavation around the bridge footings within the bay channels, mudflats, and upland;
- Pile driving and drilling to install the new footing piles;
- Excavation and drilling at all three bridges is expected to generate up to 3,800 cubic meters (5,000 cubic yards) of excess material to be disposed.

Measures to Minimize Harm

If contaminated material is encountered during construction, the construction contractor will be contractually required to comply with all applicable local, State, and Federal regulations to protect public health and the surrounding environment. The safeguards include the handling, treatment, transportation, and disposal of hazardous waste/toxic material by a licensed contractor as well as adherence to reporting protocols of the appropriate regulatory and emergency services/agencies. Excess material will be tested for contamination and will be disposed of at appropriate, fully permitted disposal sites.

Heavy construction equipment and materials would be mobilized at the area of the former Eureka/Acme Foundry adjacent to the southeast side of Eureka Channel Bridge. This site is currently a vacant lot and is shown as a temporary construction work and access area in Exhibit 13. The subsurface soil of this site is contaminated. During construction, no groundbreaking activity will be permitted at this location and geotextile fabric and gravel will be temporarily placed, where needed, on this site prior to moving any materials or equipment on to it. During construction a temporary fence will enclose the work area to protect the public.

Any off-site temporary construction areas for heavy equipment access, staging, equipment and materials storage, and sediment basins will be evaluated for the presence of hazardous waste/toxic materials.

See Section 3.4 – Water Quality, regarding discussion of on-site hazardous waste/toxic materials spill prevention and accidental spill response plan.

After measures to minimize harm are implemented, there would be no substantial risk of effects by hazardous waste/toxic materials upon the surrounding environment, construction workers, or public health during and after project construction (as shown in Exhibit 13 - Temporary Access/Work Area at Eureka Channel Bridge).

3.6 Noise and Vibration

Setting

Noise is generally defined as unwanted or objectionable sound. Noise levels are measured and expressed using the A-weighted decibel (dBA) and equivalent noise level (L_{eq}). A-weighting is a frequency correction that correlates overall sound pressure levels with the frequency response of the human ear. The L_{eq} is the average noise level on an energy basis for any specific time period. A doubling of noise energy results in a 3.0 dBA increase in noise levels. A 10 dBA increase in noise is required for the human ear to perceive a doubling in loudness. A 1-2 dBA change in noise levels is generally not perceptible.

Most of the land use activities along Route 255 are commercial, industrial, and recreational uses. There are a few residences on the Eureka waterfront; Woodley and Indian Islands; and on the Samoa Peninsula which would be exposed to construction noise at the bridges. Also an outdoor amphitheater, Carson Mill Park, a pedestrian path on the Eureka waterfront and bicycle lanes on Waterfront Drive are near the project limits (see Exhibit 3).

Exhibit 14 shows sensitive noise receptor locations such as R1, an egret rookery and R3, a residential area. Existing sound levels were measured at these noise receptor locations in order to document the existing noise levels and determine what the predicted noise levels would be during construction. The table following Exhibit 14 shows the existing noise levels measured at these locations. Most of the existing noise along Route 255 is generated from traffic on Route 255.

Measured Existing Noise Levels

Recep-tor Num-ber ◆	Date of Measure-ment	Time of Measurement	Noise Levels (Leq dBA) SLM1*	SLM 2**	Description
R1	10-22-97	1250-1350	46.7	48.5	385-meters (1,300 feet) from highway adjacent to the egret rookery
R2	10-22-97	1410-1440	43.2	45.8	Same as location 1
R3	10-22-97	1120-1150	44.5	--	On dock in front of house on Indian Island
R4	10-23-97	0800-0830	61.2	--	Adjacent to State Route 255 on Woodley Island
R5	10-3-97	0845-0915	50.6	--	Near the boat dock on Woodley Island
R6	10-3-97	1045-1015	51.8	--	In Eureka near the intersection of 2nd & P Sts.
R7	10-23-97	1045-1115	65.2	--	2nd Street near State Route 255
R8	10-22-97	1600-1630	58.6	--	On Vance Ave., 40-m (130 ft) from Samoa Br.
R9	10-23-97	1230-1300	51.7	--	In front of Peninsula Elementary School

◆ **See Exhibit 14 for Noise Measurement Receptor Locations**

***Sound level meter 1 (SLM 1) was located 1.5 meters (five feet) above ground level**

****Sound level meter 2 (SLM 2) was located seven meters (23 feet) above ground level to measure noise levels closer to egret/heron nest locations in trees; noise measurements at this elevation were not needed at noise measurement locations R3 through R9.**

In terms of vibration, the existing, privately owned uninhabited structures on the north end of Indian Island is the closest sensitive vibration receptor. As of this writing, the Table Bluff Reservation and Wiyot Tribe are in the process of purchasing the structures and surrounding land. There are tentative plans to remove these structures (Source: 9-28-00 *Times-Standard* article). The shoreline of Indian Island, already subject to wave erosion, is also a sensitive vibration receptor.

Heavy-duty trucks crossing the bridges are the primary sources of existing vibration in the vicinity of the bridge structures. Existing vibration levels from traffic are generally not perceptible adjacent to the bridge abutments.

The bridges were constructed primarily on compacted or loosely consolidated fill and bay sediment (clay, silt, sand); this type of base material transfers vibrations poorly compared to solid bedrock.

Project Effects

In order to minimize traffic noise levels, the Federal Highway Administration (FHWA) has established criteria for various land uses and activities (see Noise Abatement Criteria Table). Traffic noise impacts associated with the project would result if traffic noise levels increased and approached or exceeded the noise level for the corresponding activity category in the following table. In addition to traffic related noise impacts, noise impacts also occur if construction noise levels substantially exceed the existing noise levels.

Federal Highway Administration Program Manual
Noise Abatement Criteria

Activity Category	Noise Level dBA L_{eq}	Description of Activity Categories
A	57	Lands of which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. (Exterior)
B	67	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. (Exterior)
C	72	Developed lands, properties, or activities not included in Categories A or B above. (Exterior)
D	N/A	Undeveloped Lands
E	52	Residences, motels, hotels, public meeting interior rooms, schools, churches, libraries, hospitals, and auditoriums. (Interior)

After project construction, highway traffic would not be aligned closer to any sensitive receptors since no roadway realignment or widening is proposed. The proposed project would not result in an increase in traffic volumes on the bridges or Route 255. Consequently, potential post-construction traffic noise impacts were not evaluated.

Project construction, however, would require equipment producing varying noise characteristics at the three bridges for two to three years. A noise study was performed using a computer model to predict the construction noise levels. The areas of primary concern due to construction noise are an egret rookery located on Indian Island, the Woodley Island Marina located on Woodley Island, the residential area in Eureka, the residential area on the north end of the Samoa Channel Bridge, and the Peninsula Elementary School located on the Samoa Peninsula. See Section 3.8 - Biological Resources in this chapter for information regarding the egret rookery.

Driving temporary trestle piles, sheet piles and footing piles at all three bridges (no trestle piles at Middle Channel Bridge) would be the noisiest construction activity and could occur

simultaneously at one or more of the bridges. The actual pile driving operation would occur intermittently since the equipment would need to be moved and set-up frequently. Most of the construction noise is expected to be reduced by ground absorption and the distance to the nearest sensitive noise receptor sites. The computer model predicted that the only activity that may have a negative effect on the egret rookery site is the pile driving activity. Noise is not expected to substantially increase at the other sensitive noise locations near the bridges. Temporary noise increases from heavy trucks carrying excess earth material to remote disposal sites to and from the construction area are expected.

Heavy equipment movement would generate vibration both within the bay bottom and on land. The pile driving would generate the most vibration with a rhythmic pounding movement or a vibratory action when driving footing, trestle or cofferdam sheet piles. Pile driving at all three bridges would require a total of two to three years to complete. The vibration levels during construction at nearby locations stated in this Setting section are predicted to remain below perception.

Underwater construction noise impacts and mitigation are discussed in Section 3.8 – Biological Resources.

Measures to Minimize Harm

The following are measures to minimize temporary construction related noise:

- Noise levels shall not exceed 86 dBA at 15-meters (50-feet) between the hours of 9:00 pm and 7 am; and no pile driving will be permitted at any time at segments of the Middle and Samoa Channel Bridges closest to the egret rookery during the nesting season (approximately February through August);

- If the City of Eureka and Caltrans jointly agree, disruptive construction work will be temporarily halted during special outdoor events at the Eureka Waterfront;

- Caltrans will provide advance public notice regarding construction activities;

- Engine and pneumatic exhaust controls on pile drivers shall be used as necessary to ensure that exhaust noise from pile driver engines is minimized to the extent feasible. The controls listed above are expected to provide approximately six dBA of noise reduction.

Additional measures to minimize construction noise effects may be identified during the public agency permit process when details such as a temporary construction staging area are identified. Since the vibration effects during and after construction would be minimal, mitigation for vibration is not required other than advance public notification of construction activities. And after project construction, the traffic noise and vibration levels at the bridges and Route 255 would return to the existing conditions.

3.7 Air Quality

Setting

The Federal Clean Air Act (last amended in 1993) includes National Ambient Air Quality Standards for six air pollutants, which must not be exceeded more than once per year. In California, the California Air Resources Board and the regional Air Quality Management Districts and Air Pollution Control Districts implement both Federal and State air quality regulations. The three Humboldt Bay Bridges are located within the North Coast Air Quality Management District (AQMD). The North Coast AQMD is in attainment for all Federal and state pollutants except airborne particulate matter.

The closest sensitive air pollutant receptors include residences located within 75-meters (250-feet) of the Samoa Channel Bridge on the Samoa Peninsula. Also both the Eureka Waterfront walkway and bicycle lanes on Waterfront Drive cross under the Eureka Channel Bridge.

Project Effects

During construction, heavy equipment exhaust would generate on-site air pollutants. Air pollutants from off-site vehicles transporting equipment, materials, and personnel would also occur. Construction is expected to require two to three years to complete.

Any noticeable local effects would be an occasional diesel exhaust scent, but not in any concentrations to threaten clean air standards: such effects are expected to be an infrequent minor nuisance, and not a health threatening impact. Prevailing coastal winds during the day would expose only areas adjacent to the construction areas to any noticeable exhaust concentrations. Any alterations in climatic conditions would be infinitesimal. Air quality may temporarily degrade slightly during construction, but the project impact would be negligible. Since the applicable State and National Air Quality Standards would not be exceeded under worst case conditions, there would be no substantial adverse air quality effects from the proposed project.

Measures to Minimize Harm

The project effects are expected to be minimal and consequently no measures to minimize harm are required.

Caltrans Standard Specifications, a required part of all construction contracts, are expected to effectively reduce and control emissions impacts during construction. The provi-

sions of Caltrans Standard Specifications, Section 7-1.01F, "Air Pollution Control" and Section 10 "Dust Control" require the contractor to comply with all Unified Air Pollution Control District and other local jurisdictions rules, regulations, ordinances, and statutes. The construction areas on land would be fenced to maintain a safe distance between localized equipment exhaust emissions and bicyclists and pedestrians.

3.8 Biological Resources

Setting

Although Humboldt Bay is considered an estuary (the wide, low section of a stream or streams where ocean tide and river flows cause fresh and salt water to mix), the bay is heavily marine-influenced in terms of salinity and associated marine life. Woodley Island is partially developed, with a marina on the south side of the island. Indian Island and Daby Island are dominated by salt marsh habitat and are undeveloped near the bridges.

The bridges are also adjacent to two managed areas of salt marsh and related undisturbed habitat. Indian Island is part of the U. S. Fish and Wildlife Humboldt Bay National Wildlife Refuge. The refuge was established to preserve and enhance habitat values associated with migratory waterbirds, particularly the black brant (*Branta bernicla nigricans*), and a variety of shorebirds and other estuary-dependent species. Most of the undeveloped portions of Woodley Island are within the Humboldt Bay Harbor Recreation and Conservation District's Woodley Island Wildlife Area.

There are small areas of upland vegetation and trees within the immediate work area at either end of the Eureka Channel Bridge. Both of these areas are within Caltrans right-of-way and on the existing highway fill. The areas are of poor value for wildlife because of the presence of exotic vegetation and the proximity of the highway.

The following sensitive biological resources occur within the project area:

Mudflats/Eelgrass. Mudflats are one of the categories of special aquatic sites designated by the U. S. Environmental Protection Agency in Section 404 (b)(1) guidelines of U. S. Clean Water Act. The U. S. Army Corps of Engineers regulates the placement of dredge and fill materials into these special aquatic sites under both Section 10 and 404 of the Clean Water Act. In areas subject to tidal influence, Section 404 jurisdiction extends to the High Tide Line (HTL). Section 30233 of the California Coastal Act also regulates the filling, diking, or dredging of open coastal waters and estuaries. See Appendix D for the text of Section 30233, California Coastal Act.

At certain elevations and conditions, mudflats often support populations of eelgrass (*Zostera marina L.*). Eelgrass is a rhizomatous species of sea grass that colonizes the shallow areas of the bay within approximately 0.3-meter (one-foot) above to 0.3-meter (one-foot) below mean low low water (MLLW) level. The Army Corps of Engineers has

estimated that currently there are approximately 1,200 hectares (3,000 acres) of eelgrass populations/habitat in Humboldt Bay. The majority of the eelgrass populations/habitat are located in the south arm of the bay, far removed from the project area. In the north arm of the bay, the eelgrass habitat area was substantially reduced in the 1950's due to oyster cultivation operations. While some large populations remain near the oyster farms, most of the eelgrass populations in the north arm of the bay form an elevation dependant ring around the shore, and the shores of the islands. Eelgrass population size and location can vary substantially by season as well as from year to year. The exhibits in Appendix E indicate eelgrass habitat locations, not necessarily eelgrass population coverage, within the project area.

Wetlands. There are two small areas of poor quality wetland within the project area. Wetlands are one of the categories of special aquatic sites designated Section 404 (b)(1) guidelines of the U. S. Clean Water Act.

One of the wetland areas is a small, tidally influenced drainage ditch carrying brackish water beside the railroad tracks located at the westernmost end of the Samoa Channel Bridge, where wetland vegetation has established. The wetland area consists of a margin of hydrophytic vegetation along both sides of the ditch, both upstream and downstream from the pier. Vegetation directly under the bridge is lacking due to overshadowing by the bridge and human impacts. The center of the ditch is not vegetated. The most abundant plant species in this wetland is *Spartina densaflora*, an invasive species that is on the California Native Plant Society's Invasive Weeds of Humboldt County A-List (most harmful). Because of the limited extent of the wetland and the disturbance present, the value of the wetland adjacent at this location is low as compared to other reaches of the ditch further away from this location and similar tidal wetlands in the vicinity.

The other wetland is within a vacant lot owned by the City of Eureka, located east of the Eureka Bridge boat ramp parking lot. Most of this vacant lot is paved, but there are three unpaved areas, which support wetland vegetation (not all unpaved areas support wetland vegetation). City of Eureka maintenance activities have contributed to the degradation of this wetland area. These three unpaved areas could not be verified as wetlands defined by the 1987 Army Corps of Engineers Wetlands Delineation Manual. A wetland delineation could not be performed due to the possible presence of hazardous waste within the soil from an old mill site.

Egret Rookery. Egrets and herons are some of the wading shorebirds that inhabit Humboldt Bay. These species are colonial nesters and usually concentrate on the same nesting and rearing sites year after year unless disturbed. With the exception of San Francisco Bay, Humboldt Bay supports the largest populations of wading birds such as herons and egrets in California. Indian Island supports one of the largest heron and egret rookeries north of San Francisco Bay. Common egret (*Casmerodius albus*), snowy egret (*Leucophoyx thula*), Great blue heron (*Ardea herodias*), and Black-crowned night heron (*Nycticorax nycticorax*) nest and rear young there every year. Nesting birds can be very

sensitive to noise and other disturbance from human activities, and if sufficiently disturbed, particularly over extended periods of time, may abandon all nesting activities.

Marine Mammals. Pacific harbor seals are the most common marine mammals in Humboldt Bay, and are present in the channels year round, using them for foraging and resting. There do not appear to be any regularly used haul-out areas near the bridges. (A haul-out area is a shoreline site where seals congregate, primarily to rest or to nurse their pups.) Harbor seals are not listed under the Endangered Species Act or considered a strategic species under the Marine Mammal Protection Act. Steller sea lions (*Eumetopias jubata)*, which are listed as threatened under the Endangered Species Act, are occasionally observed in Humboldt Bay, and are discussed further in this document in the Threatened and Endangered Species section. The California sea lion (*Zalophus californianus*) and the Pacific harbor porpoise (*Phocaena phocoena*) have also been observed in the bay.

Essential Fish Habitat. The 1996 amendments to the Magnuson-Stevens Act set forth a number of new mandates for the National Marine Fisheries Service (NMFS), eight regional fishery management councils (Councils), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate Essential Fish Habitat (EFH) for all managed species. Federal agencies, which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and are required to respond in writing to NMFS' recommendations. The proposed project is located within an area designated as EFH for the Coastal Pelagics, Pacific Salmon and Pacific Groundfish Fisheries Management Plans (FMP). Of the 90 species that are federally managed under these plans, eighteen are known to occur in Humboldt Bay and could be affected by the proposed project.

Northern anchovy (*Engraulis mordax*) is the only one of the five species in the Coastal Pelagics FMP that is well represented in the project area. Northern anchovy are very abundant in Humboldt Bay. This species utilizes the bay for spawning and as a nursery site. Their distribution throughout the bay depends on the tide stage. Two of the three species in the Pacific Salmon FMP are represented near the project site. Coho and Chinook salmon use the bay both for migration and for nursery habitat. Neither Coho nor Chinook spawn in the bay. Of the fifteen species present from the Pacific Groundfish FMP, the most abundant species in the bay, with catches often exceeding all other species, is English sole (*Parophrys vetulus*). English sole is most common in mid-channel trawls at the mouth of the Eureka Slough, and north and east of Indian Island, Eureka, Samoa, and North Bay Channels. These fish can be found year round as residents in the bay. The Starry flounder (*Platichthys stellatus*) and many rockfish species (*Sebastes spp.*) are commonly taken or seen near the project area.

Although not regulated as a federally managed species, Pacific herring is an important commercial fish species in Humboldt Bay regulated by the California Department of Fish and Game. They spawn in the bay in sub-tidal zones on aquatic vegetation such as eelgrass. The peak spawning period in Humboldt Bay usually occurs during January and

February. Because these fish are harvested primarily for their roe, this is also the peak time for commercial herring fishing.

Nesting on Bridges. Surveys have shown Peregrine falcon (*Falco peregrinos*) roosting and hunting and eating under the bridges, but no evidence of Peregrine falcon or any other raptor nesting in the superstructure of the bridges has been found. Biologists at the California Department of Fish and Game have stated that it is highly unlikely that the bridges are being used as nesting sites. There are a few cliff swallows (*Petrochelidon pyrrhonota*) nesting around the shear keys near the top of the bridge columns. No work is proposed at these locations, however disturbance from construction activities in close proximity to the nests could disturb and possibly cause swallows to not initiate nesting or abandon their nests.

Threatened and Endangered species. As part of the Section 7 Endangered Species consultation process, biological assessments describing potential impacts to the following threatened and endangered species within the project area were submitted to the U. S. Fish and Wildlife Service and the National Marine Fisheries Service.

- **Bald Eagle (*Haliaeetus leucocephalus*).** The bald eagle is listed as Threatened under the Endangered Species Act. It is an uncommon visitor to the project area. Bald eagles using the project area would be scavenging or foraging. There are no known eagle nests in the project vicinity and no bald eagles were observed during the project survey period.

- **Aleutian Canada Goose (*Branta canadensis leucopareia*).** The Aleutian Canada goose is listed as Threatened under the Endangered Species Act. It is a migratory bird that nests in the Aleutian Island chain in northwest Alaska; it stops over at various locations in Del Norte and Humboldt counties on its way to wintering areas in California's Central Valley. In Humboldt County they are most commonly found in pasturelands in the Arcata and Eel River Bottoms; they can also be found in river estuaries.

- **Western Snowy Plover (*Charadrius alexandrinus nivosus*).** The western snowy plover is listed as Threatened under the Endangered Species Act. It is a small shorebird which is an occasional migrant and winter visitor in Humboldt County that is known to nest and forage on sandy beaches and river gravel bars; at times in other locales they are found nesting on dry mud or salt flats. In Humboldt County the major known nesting areas are the Clam Beach areas and the Eel River gravel bars. Few occurrences of western snowy plover have been recorded in Humboldt Bay; most of those occurrences have been in South Bay on the sandy uplands on the inland side of the South Spit. It is unlikely that the bird would be found foraging in the mudflats or adjoining uplands in the project area.

- **Marbled Murrelet (*Brachyramphus marmoratus*).** The marbled murrelet is listed as Threatened under the Endangered Species Act. It forages most commonly in near shore waters out to 500-meters (1,600-feet), although it is sometimes found in other

more inland waters such as Puget Sound and Humboldt Bay. It nests inland on the limbs of large coniferous trees. Although no nesting habitat can be found within or near the project limits, the waters of Humboldt Bay at times provide foraging habitat for murrelets. Marbled murrelets forage on near shore fish and marine invertebrates. No marbled murrelets were observed or heard during project surveys.

- **California Brown Pelican (*Pelecanus occidentalis californicus*).** The California brown pelican is listed as Endangered under the Endangered Species Act. It is a common summer and fall visitor to Humboldt County. They are found in the greatest numbers from June through October. It is uncommon in winter and early spring. Humboldt Bay is a popular destination for the migrating birds. Pelicans feed on a variety of small fish which are either resident or enter Humboldt Bay to spawn. Pelicans often use man-made structures to roost during both the day and night. Pelicans were observed regularly during 1999 spring and summer surveys of the project area at all three bridge locations, including on the bridge footings. Pelicans also use several rafts used for maraculture for day and night roosting.

- **Steller sea lion (*Eumetopias jubata*).** The Steller sea lion is also known as the Northern sea lion and is listed as Threatened under the Endangered Species Act. Steller sea lions breed on rocks and isolated beaches. The Steller sea lion is mainly found in the ocean although they do enter estuary areas, at times, to forage. Steller sea lions are known to enter Humboldt Bay, although they typically are seen near the entrance channel, which is located several miles south of the proposed project limits. No Steller sea lions have been observed during periodic surveys of Humboldt Bay Bridges by Caltrans biologists, and NMFS has no records of species' haul-out areas within Humboldt Bay. (A haul-out area is a shoreline site where seals or sea lions congregate, primarily to rest or to nurse their pups.)

- **Tidewater Goby (*Eucyclogobius newberryi*).** The tidewater goby is listed as Endangered under the Endangered Species Act. It is endemic to California and is found within brackish water habitats along the California coast. Tidewater gobies do inhabit tributary streams to Humboldt Bay and likely move within the bay to some extent since they are known to re-colonize isolated habitats where populations were extirpated. They primarily would be expected to inhabit brackish portions of the tributary streams and the upper/brackish ends of bays and lagoons. In Humboldt Bay tidewater gobies are most likely to be found in estuaries of streams such as Elk River, Eureka Slough, and Jacoby Creek or in the upper reaches of the bay adjacent to those streams. Suitable habitat for resident tidewater gobies is not present at the project location; therefore it would be highly unlikely that any tidewater goby would be found within the project area.

There are three listed anadromous fish species known to occur within the limits of the project. They are coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), and Northern California steelhead (*Oncorhynchus mykiss*). All three species are considered Threatened under the Endangered Species Act. The project location

is an estuary, which is not suitable for spawning for any of the three fish species. The project site is primarily used as a migration corridor and as foraging habitat for juvenile fish that are out-migrating to the ocean, or adults migrating in to freshwater streams to spawn.

- **Southern Oregon/Northern California Coast Coho Salmon (*Oncorhynchus kisutch*).** The coho salmon was listed as Threatened by the National Marine Fisheries Service on May 6, 1997. The Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU) is within the limits of this project. This ESU includes the coho salmon between Cape Blanco, Oregon and Punta Gorda in Humboldt County, California. Coho smolts principally use channels as corridors to directly migrate into the ocean. However, residence times have been observed in some Pacific Northwest estuaries.

- **California Coastal Chinook Salmon (*Oncorhynchus tshawytscha*).** Based on its recently completed comprehensive scientific review of Chinook salmon along the entire U.S. West Coast, the NMFS listed the California Coastal Chinook ESU salmon as Threatened on November 15, 1999. The California Coastal ESU includes the Chinook salmon in California from Redwood Creek in Humboldt County in the north to the Russian River in the south. Estuaries within these geographical limits, including Humboldt Bay, have been designated critical habitat. Chinook salmon use estuary environments such as Humboldt Bay for juvenile rearing and as a means of moderating the parr/smolt transition.

- **Northern California Steelhead (*Oncorhynchus mykiss*).** The Northern California steelhead ESU was listed as Threatened on August 7, 2000. Critical habitat has not yet been designated by NMFS.

Project Effects

As discussed earlier in this section, Caltrans prepared and submitted a Biological Assessment to the U.S. Fish and Wildlife Service (USFWS) for listed species protected under Section 7 of the Endangered Species Act. The USFWS responded with a letter dated December 12, 2000 concurring with Caltrans' and Federal Highway Administration's determination that the proposed project may affect, but is not likely to adversely affect the brown pelican, tidewater goby, bald eagle, Aleutian Canada Goose, marbled murrelet, and western snowy plover. For information regarding measures to ensure avoidance of adverse effects to these listed species, see the measures to minimize harm section following this section.

As discussed earlier in this section, Caltrans prepared and submitted a Biological Assessment to the National Marine Fisheries Service (NMFS) for marine species protected under Section 7 of the Endangered Species Act. In response to the Biological Assessment, a Biological Opinion from NMFS was issued on August 15, 2001. The NMFS concurred that the project may affect the following species and designated critical habitat:

Southern Oregon/Northern California Coast coho salmon (*Oncorhynchus kisutch),* California Coastal Chinook salmon (*Oncorhynchus tshawytscha*), Northern California Steelhead (*Oncorhynchus mykiss)*, and the Steller sea lion (*Eumetopias jubatus)*. More specifically, NMFS concurred the proposed project is not likely to jeopardize the continued existence of these fish species or result in the destruction or adverse modification of their designated critical habitat. Also, NMFS anticipates that the project may have more than a negligible likelihood to result in incidental take of the three fish species. Based on the low likelihood of a Stellar sea lion being present in the action area, the proposed project is not likely to adversely affect Steller sea lions.

The Federal Highway Administration also requested Essential Fish Habitat (EFH) consultation with NMFS to address potential impacts to the Coastal Pelagics, Pacific Salmon and Pacific Groundfish Fisheries Management Plan (FMP) areas. The fish species addressed in these plans do not have optimal habitat for either foraging or spawning in the deep-water channel parts of the project area, but do use it for passage further into the bay. One potential effect of the proposed project on these fish is the temporary loss of mudflat habitat resulting from construction activities. The NMFS concluded that the proposed project may adversely affect designated essential fish habitat for chinook and coho salmon, Pacific groundfish, and coastal pelagic species.

While Pacific herring is not listed in any of the above FMPs, it is an important commercial fish species in Humboldt Bay. Caltrans is currently consulting with California Department of Fish and Game to address potential impacts to Pacific herring.

The primary potential adverse impact of the project on the subject species and their habitat is the possibility of a spill of petrochemical products such as diesel fuel, lubricants and hydraulic fluids. In addition, wet concrete or cement powder in the water can be toxic to the ecosystem. These materials all have some potential to enter the waters of the bay during construction. To gain access to the existing shallow-water pier footings (which will be retrofitted), equipment will be operated on trestles constructed over the mudflats; deepwater piers will be accessed from barges. Large equipment, such as cranes, will be stationary at these locations. Periodic equipment refueling will not be allowed on the temporary trestles.

The marbled murrelet and California brown pelican feed in the bay and are potentially vulnerable to their prey base being contaminated by accidental water pollution. The project site is not located within designated critical habitat of the marbled murrelet or California brown pelican, and the U.S. Fish and Wildlife Service concurred with Caltrans' and Federal Highway Administration's determination there is little to no potential for harassment or take of these threatened or endangered species.

The Pacific harbor seal and threatened Steller sea lion also feed in the bay and, like the birds, are potentially vulnerable to their prey base being contaminated by accidental water pollution, and will be protected by the same measures implemented to protect the birds. Project construction-related activities including pile driving, operation of boats and

barges, and excavation activities all could result in harassment of marine mammals by disturbing foraging patterns or possibly disturbing animals. However, boat traffic and coastal-dependent industrial activity are already commonplace within, and adjacent to Humboldt Bay. In addition, the project will result in only negligible changes to the bay ecosystem, which is remote from the primary habitat of the Steller sea lion. It is expected that the project is not likely to result in adverse modification of critical habitat of the Steller sea lion.

Pile driving operations have the potential to harass marine mammals in close proximity. The highest sound energy is expected to occur during the driving of 44, 1.5-meter (five-foot) diameter steel shell footing piles at the deep-water piers of Samoa Channel Bridge. The footing piles proposed for the other two bridges would be 900-mm (three-foot) diameter and much of the pile driving would occur within cofferdams or at upland locations. Driving temporary trestle piles, sheet piles and footing piles at all three bridges (except no sheet piles for coffer dams at Middle Channel Bridge) could occur simultaneously at one or more of the bridges. The actual pile driving operation would occur intermittently since the equipment would need to be moved and set-up frequently. Sea mammals and fish are highly mobile and sensitive to underwater noise. As such, the construction activity is expected to discourage sea mammals and fish from staying in the construction area, thereby minimizing exposure to potentially harmful noise.

Although the potential for adverse impacts to coho salmon, Chinook salmon, and steelhead is low, the nature of the proposed activities associated with the subject seismic retrofit project may adversely affect any one or all three of the species. One adverse effect that could occur as a result of the proposed project is the possible entrapment of any one of the three salmonids in the cofferdams. Sheet piles may be driven to enclose the work areas around the shallow water piers; this installation will isolate the water around the piers. Any fish present in this enclosure will be trapped and cut off from the bay waters. The water within the cofferdam will be pumped out to de-water the workspace around the pier footing to allow the construction of forms and subsequent concrete pour. If salmon are trapped in the cofferdam, pumping could cause mortality to those fish. To minimize this risk, the pump intake will be double-screened to prevent fish from being pumped out with the water. A biologist will be present during the pumping to ensure that any fish present at the bottom of the dammed area are netted and immediately placed in the bay outside the cofferdam. The rescue operation, if necessary, could result in some harassment and possibly mortality due to handling shock.

While there is some potential for adverse impacts due to increased turbidity or other water pollution, any water quality effects are expected to be non-substantial. Most turbidity will be localized and short-lived; the turbidity is expected to occur when the piles for the trestles and the sheet piles for the cofferdams are driven and when they are removed. The small amount of aquatic vegetation (mostly eelgrass) removed by the project will be minor relative to what is available in the bay ecosystem. The temporary loss of aquatic vegetation will not have any lasting impact on the listed species or their habitat. Eelgrass impacts and proposed eelgrass mitigation plan is discussed later in this section.

Occurrences of tidewater goby are highly unlikely within or near the project limits. There is little to no potential for harassment or take of this species.

Egret Rookery. The size of the egret and heron rookery on Indian Island makes it an important and unique biological resource, and necessitates measures to protect the egrets and herons, particularly during the breeding season. Due to its proximity to the highway, the birds that nest at this rookery are already accustomed to a high level of noise disturbance. A noise study was conducted within the project limits, and California Department of Fish and Game biologists were consulted, and pile driving was identified as the only type of construction activity that was louder than the ambient noise from the highway. It was also determined that construction activities and associated noise on most of the project area were too far away to cause adverse impacts to the rookery. Work on the westernmost part of the Middle Channel Bridge and the easternmost part of the Samoa Channel Bridge will be close enough to the rookery to cause a potential for disturbance. A construction work restriction will be imposed to minimize disturbance. (See Measures to Minimize Harm section for more information.)

Eelgrass. The project area was surveyed for eelgrass in October 2000 and August 2001 in order to establish a baseline to quantify project impacts. Fall is the peak period for eelgrass growth, and the year 2000 was an exceptionally productive year (Becky Ota, pers. com.). Therefore, the calculated areas of impacted eelgrass populations can be considered a worst case scenario, and the actual populations impacted by this project may be less. Eelgrass population size and location can vary substantially by season as well as from year to year. The exhibits in Appendix E indicate eelgrass habitat locations, not necessarily eelgrass population coverage, within the project area. Pre and post construction surveys will be conducted to further define the areas of impact.

Eelgrass and other aquatic vegetation removed by the project would be in minor amounts relative to what is available in areas both nearby the project site, and in the Humboldt Bay ecosystem. In the north arm of the bay, the City of Eureka has removed almost 4,000 square meters (43,000 square feet) of eelgrass and suitable habitat during the construction of a boat launch ramp. In contrast, the Humboldt Bay Bridges Seismic Retrofit project is expected to temporarily impact a maximum of 3,046 square meters (32,787 square feet) of eelgrass populations, impacting the plants but leaving the area suitable for replanting and re-colonization. No more than 107 square meters (1,152 square feet) of inventoried eelgrass habitat would be permanently extirpated from the bay as a result of this project. Table 1 is a summary of eelgrass impacts. Tables 2 and 3 also include eelgrass impacts in the context of U. S. Army Corps of Engineers Special Aquatic Sites and Jurisdictional Waters. Eelgrass mitigation is discussed later in this section.

In order to minimize impacts to eelgrass habitat by unconfined excavation and filling activities, all construction activities at the footings of the shallow water piers except those at the “low clearance” piers (E-11 through E-15) will be inside cofferdams. To further minimize impacts to eelgrass habitat and mudflats, construction access to all work in the shallow areas will be obtained from temporary work platforms and trestles rather than from temporary fills in the bay. The construction of cofferdams to de-water the work areas

around the shallow water piers and the trestles to access those piers will cause temporary disturbance to eelgrass habitat and mudflats near the bridges. The cofferdams and trestle piles will have direct temporary impacts to the mudflats and bay floor. The trestles would indirectly impact the same areas by shading the eelgrass populations. These activities might kill the individual plants, but they will not impact the elevation of the area or its ability to sustain eelgrass populations. The disturbance of this small area of habitat should have no long-term impacts on any listed species.

Table 1
Summary of Impacts to Eelgrass Resources
Areas in Meters^2 (Feet ^{2})

Impact Activity	Permanent Impact to potential eelgrass habitat*	Potential Temporary Impact on eelgrass populations*
Eureka Channel		
Enlarged Pier Footings	51 (550)	
Excavation		774 (8,331)
Trestle shading (including 24 m^2 Trestle Piles)		959 (10,323)
Barges resting on channel bottom		873 (9,397)
Subtotals	51 (550)	2,606 (28,051)
Middle Channel		
Enlarged Pier Footings	28 (301)	
Excavation		0
Trestle shading (including 1 m^2 Trestle Piles)		38 (409)
Barges resting on channel bottom		138 (1,485)
		0
Subtotals	28 (301)	176 (1,894)
Samoa Channel		
Enlarged Pier Footings	28 (301)	
Excavation		0
Trestle shading (incl. 18 m^2 Trestle Piles)		264 (2,842)
Barges		0
Subtotals	28 (301)	264 (2,842)
Totals	**107 (1152)**	**3,046 (32,787)**

***** The term eelgrass "populations" should not be confused with the term eelgrass "habitat." Eelgrass habitat consists of the natural conditions and environment suitable for eelgrass. Because of the variability of eelgrass growth, the actual eelgrass populations within eelgrass habitat at any given time may vary substantially.

It is noted here for informational purposes that the total area of eelgrass populations extirpated by the enlarged pier footings is 38 square meters (408 square feet). The important distinction drawn in this report is the difference between potential eelgrass habitat and eelgrass populations.

Table 2

Temporary Impacts to U. S. Army Corps of Engineers Special Aquatic Sites and Jurisdictional Waters Areas in Meters^2 (Feet ^{2})

	Eureka Channel	Middle Channel	Samoa Channel	Totals
Mud flats[1] impacted by trestle piles, coffer dams, excavation	~2,000 (21,530)	~1,400 (15,070)	~1,354 (14,570)	~4,754 (51,170)
Eelgrass populations[2] impacted by shading from temporary trestles, trestle piles, excavation, coffer dams, barge access at Eureka Channel	2,606 (28,051)	176 (1,894)	264 (2,842)	3,046 (32,787)
Wetlands	0	0	120 (1,290)	120 (1,290)
Deep Water Channel Bottom[3] (>1.8 meters MLLW)	0	0	0	0

Table 3
Permanent Impacts to U. S. Army Corps of Engineers
Special Aquatic Sites and Jurisdictional Waters
Areas in Meters^2 (Feet ^{2})

	Eureka Channel	Middle Channel	Samoa Channel	Totals
Mud flats[1] impacted by trestle piles, coffer dams, excavation	0	0	0	0
Eelgrass Habitat[2] impacted by enlarged footings	51 (550)	28 (301)	28 (301)	107 (1,152)
Wetlands	0	0	0	0
Deep water channel bottom[3] (>1.8 meters MLLW) impacted by enlarged columns, enlarged footings, and additional footing piles; considered permanent.	121 (1,302)	244 (2,626)	562 (6,050)	927 (9,978)

[1]Tidally influenced, non-vegetated, non-eelgrass habitat

[2]The term eelgrass "populations" should not be confused with the term eelgrass "habitat." Eelgrass habitat consists of the natural conditions and environment suitable for eelgrass. Because of the variability of eelgrass growth, the actual eelgrass populations within eelgrass habitat at any given time may vary substantially.

[3]Deep water channel bottom is not a Special Aquatic Site and is generally non-vegetated, but is Corps jurisdictional

Construction would require excavating around the "low clearance piers" on the Woodley Island side of the Eureka Bridge (E-11 through E-15) unless the contractor is capable of constructing cofferdams without open excavation or causing additional environmental impacts. The areas around the piers will be accessed with small barges that will rest on the mudflats at low tide, impacting any eelgrass populations underneath the barge. (Note that at all other locations that require barge access, the barges would be used at deep-water channels and would not contact the channel bottom.) The excavation area will be sloped back at approximately three-foot horizontal to one-foot vertical (3:1) or steeper. The footings are presently buried in up to three-meters (ten-feet) of bay mud. In order to minimize impact to eelgrass habitat, Caltrans will require the contractor to store the sediment excavated from the area around the low clearance piers and reuse it to backfill these excavated areas after the retrofit work is completed. The excavated area will be restored to pre-construction elevations conducive to the growth of eelgrass. Because of water quality and turbidity concerns, turbidity barriers will be placed around this area during unconfined excavation and back-filling.

Eelgrass habitat surrounds two of the bridge footings that will be enlarged during the seismic retrofit. These are the footings of pier M-9 of the Middle Channel Bridge, and pier

S-2 of the Samoa Channel Bridge. Adding piles and enlarging the footings at these bridge piers will result in small areas of permanently lost potential eelgrass habitat (not the actual areas of eelgrass populations). The U. S. Army Corps of Engineers regulates the permanent placement of dredge and fill materials into special aquatic sites under Sections 10 and 404 of the U. S. Clean Water Act. These special aquatic sites include mudflats, which support eelgrass populations.

The retrofit work at the three bridges has the potential to disturb four primary habitat types: upland, wetland, mudflat, and deep-water. The retrofit will not impact any salt marsh habitat or wildlife managed areas.

Upland Impacts. Staging and storage areas and equipment access roads for the proposed project will affect a small amount of upland habitat. No rare plants were found during surveys. Three trees (one eucalyptus and two Monterey cypress) with diameters at breast height (DBH) of approximately 600-mm (24-inches) will need to be removed near the Eureka Channel Bridge abutment on Woodley Island to create an access road to transport equipment onto the trestles. The area will be re-vegetated after construction is completed. Native trees will be planted to replace those removed during construction. All of the area is within Caltrans right-of-way, and on the existing highway fill. In addition, the areas proposed for access roads and staging areas are of poor value for wildlife because of the presence of non-native vegetation and the proximity of the highway.

Wetland Impacts. The Army Corps of Engineers regulates the placement of dredge and fill materials into special aquatic sites under Section 404 of the U. S. Clean Water Act. These special aquatic sites include wetlands. The drainage ditch and associated wetland located alongside the railroad tracks, at the westernmost end of the Samoa Channel Bridge will be diverted in a temporary culvert for several months in order to place the cofferdam and de-water the area around pier S-20 so that it can be retrofitted. (See Exhibit 8 for location of pier S-20.) After the work at S-20 is complete, the culvert will be removed, and the water restored to its natural drainage channel. The area of wetland impact is approximately 120 square meters (1,290 square feet). During the remainder of the project, the drainage ditch will be bridged with a trestle to create an access road for work on the remaining piers and further trestle construction with minimal impact to the wetland.

Three unpaved portions of the vacant owned by the City of Eureka located east of the Eureka Bridge boat ramp parking lot will be fenced and designated as Environmentally Sensitive Areas (ESA) to prevent the wetland vegetation from being affected by this project. These are three separate areas totaling approximately 2,000 square meters 21,500 square-feet). Prior work in this yard by contractors for the City of Eureka, as well as activities associated with the highway and the boat ramp have caused this wetland area to become degraded.

Seismic retrofit construction activities and site access on the islands will not directly affect existing salt marshes on the islands. It will only occur on the existing highway fill.

In accordance with Executive Order 11990 regarding wetland impacts, there are no prac-

ticable alternatives to the proposed action other than the No-Build Alternative, which does not accomplish the project purpose and need. Caltrans will be applying for Section 404 permit from the U. S. Army Corps of Engineers. As a condition of this permit, Caltrans will consult with the U. S. Army Corps of Engineers regarding restoration of the wetland at the westernmost end of the Samoa Channel Bridge and avoidance of the ESAs in the storage yard. There will be no net loss of wetland as a result of this project, so Caltrans does not anticipate any additional mitigation.

Section 30233 of the California Coastal Act is similar to Executive Order 11990 regarding the filling of wetlands: filling wetlands shall be permitted where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects and shall be limited to a specific allowable use. The wetland impact within the artificial ditch would be limited to temporary fill in order to de-water and work on one existing bridge footing. Removing the fill material will allow the ditch to re-vegetate and return to the pre-work condition.

Mudflat Impacts. The Army Corps of Engineers regulates the placement of dredge and fill materials into special aquatic sites under Sections 10 and 404 of the U. S. Clean Water Act. These special aquatic sites include salt marsh, and mudflats. In areas subject to tidal influence, Section 404 jurisdiction extends to the High Tide Line (HTL). Section 30233 of the California Coastal Act also regulates filling and excavation of mudflat and coastal bay sites. Approximately 4,754 square meters (51,170 square feet) of mudflat would be temporarily impacted by trestle and cofferdams installation. Tables 1 and 2 provide a summary of mudflat impacts.

Deep-Water Impacts. In terms of impacts, the deep-water habitat can be divided into the open water habitat and the channel bottom habitat. The channel bottom would be permanently affected by the placement of bridge footing piles in the deep channels. Temporary impacts from trestles would be avoided by utilizing barges to access deep-water footings that would not rest on the channel bottom. For a summary of impacts to the channel bottom of the deep-water habitat, refer to Tables 2 and 3.

In-water construction activities such as pile driving could disrupt salmon migration through the Eureka Channel during the spring and summer.

Measures to Minimize Harm

Caltrans and the construction contractor will be required to adhere to specific terms and conditions provided by the NMFS to minimize incidental take of the three salmonid fish species and to minimize impact to Essential Fish Habitat for chinook and coho salmon, Pacific groundfish, and coastal pelagic species:

- All work on Eureka Channel Bridge within waters of Humboldt Bay will be completed within the in-water work period from September 1 to March 31 with the exception of eelgrass replanting at the cofferdam areas around piers E-12 through E-15. An ex-

ception may be requested to replant these areas with eelgrass during the May and early June timeline as suggested by the California Department of Fish and Game.

- The construction contractor will develop and implement site-specific best management practices, a water pollution control plan, and emergency spill controls, and is responsible for containment and removal of any toxins release.

- Alteration of eelgrass populations, and mudflats capable of supporting eelgrass, shall be minimized. The total area of eelgrass affected shall be mitigated and monitored adequately to ensure that there is no net loss of eelgrass as detailed in the eelgrass mitigation plan.

- A fisheries biologist shall continuously monitor the project area during the entire coffer dam de-watering process. The biologist shall capture any covered salmonids that may become stranded in the residual wetted areas as a result of project activities and relocate the individuals to the bay.

After the cofferdams and trestles are removed, and the excavated area is returned to pre-construction elevations, the areas of temporarily disturbed and eelgrass populations are expected to re-colonize naturally from the surrounding undisturbed populations. Approximately 465 square meters (5,000 square feet) of the area excavated around the low clearance piers, E-11 through E-15 in the Eureka Channel will be replanted with eelgrass to promote re-population at these locations. Eelgrass for re-planting at this location will be harvested from other Corps of Engineers, Fish and Wildlife, and Fish and Game approved sites. It is envisioned one alternative harvest site that could be utilized is an eelgrass populated drainage channel at the Eureka Public Marina that undergoes periodic maintenance cleaning.

During and after construction, eelgrass population locations shaded by temporary trestles will be monitored. If eelgrass populations decline as a direct result of temporary trestle shading and are not recovering naturally after construction, Caltrans will meet with resource agencies to determine if any required remedial action is necessary.

The area of eelgrass habitat that will be permanently lost due to construction of the enlarged pier footings will be mitigated pursuant to the conditions set forth in the U. S. Army Corps of Engineers permit (special aquatic sites) that is required for this project. The proposed eelgrass mitigation would also help offset the permanent loss of mudflat habitat. An eelgrass mitigation plan was developed in consultation with the California Department of Fish and Game, U. S. Fish and Wildlife Service, the California Coastal Commission, U. S. Army Corps of Engineers, and National Marine Fisheries Service to mitigate eelgrass impacts.

The eelgrass mitigation plan proposes to establish 107 m^2 (1,152 square feet) of onsite eelgrass habitat of like value and functional equivalency to the areas permanently lost. Mitigation site preparation consists of placing rock above the site to prevent material from sloughing into mitigation site and will provide rocky inter-tidal habitat; removing rock and

debris to expose the bay bottom substrate; a portion of the substrate will be removed; inoculating mud from the bridge retrofit work area will be placed in the site; and replanting the newly created habitat with healthy eelgrass clusters. This work will be performed from a low-draft barge working at high tides or resting temporarily on the bay bottom. There are existing eelgrass populations and mudflat habitat located adjacent to the mitigation site; a qualified biologist will provide guidance regarding barge mooring locations as well as the earthwork to avoid or minimize harm to the adjacent mudflat and eelgrass habitat. A turbidity barrier will be installed adjacent to the proposed mitigation area to capture suspended sediment generated during site preparation work. See Exhibits 5 and 15 for the location of the proposed mitigation site.

To minimize the potential for construction noise impacts to nesting birds on Indian Island, pile driver operations will be prohibited at piers M-7, M-8, M-9, S-2, S-3 and the trestles associated with those piers, between February 15th and August 15th during each year of construction. This seasonal restriction on work covers the nesting periods of most of the species nesting at the rookery.

California brown pelicans often roost at night on maraculture rafts north of the Samoa Channel Bridge. To avoid possible adverse effects upon California brown pelicans, work on that bridge generally will be limited to daylight hours as long as pelicans are present within the work area. Work not involving loud equipment and bright lights may occur during nighttime hours as necessary to prepare for daylight operations (examples being setting up traffic control or fueling). Work into the evening also may occur in rare situations when work is delayed for some unforeseen reason such as a mechanical breakdown involving an operation such as a concrete pour or other similar operation where delays need to be minimized. Such events should be rare and are not likely to extend far into the evening.

Also, since California brown pelicans might perch on bridge footings or trestles, a non-harassing, non-harmful method acceptable to the U. S. Fish and Wildlife Service to prevent pelicans from perching within the active work areas will be developed prior to construction.

During pile driving activities, Caltrans staff are planning to establish an underwater noise monitoring zone for sea mammals. The zone would be defined by mapping out locations where underwater construction noise levels reach a harassment level to sea mammals. A wildlife biologist will monitor sea mammals in the bay during pile driving activity. Caltrans staff will coordinate with the National Marine Fisheries Service to develop other measures to minimize incidental harassment to sea mammals. An incidental harassment authorization for marine mammals from the NMFS will be necessary prior to construction.

The use of Best Management Practices for equipment operation and refueling on or over waters will help protect the subject species from water pollution. These practices will include the use of secondary containment and non-toxic hydraulic fluids where practicable. Contingency planning to allow for expeditious containment and cleanup of inadvertent spills will also be required through contract specifications. In addition, the California Office of Spill Prevention and Response will regulate fueling over water.

Most of the excavation and drilling work in submerged and inter-tidal areas can be accomplished within confined areas created by cofferdams thereby minimizing vegetation disturbance and water turbidity. Excavated, de-watered, and drilled bay material will either be returned to the bay or placed in approved disposal areas, based on the direction from public resource agencies.

Additional measures to minimize harm or impact mitigation might be required in resource agency permits. Permits will be required from the California Department of Fish and

Game and U. S. Army Corps of Engineers. Coastal development permits will be required from the City of Eureka and California Coastal Commission, and possibly County of Humboldt. Permits from the Regional Water Quality Control Board and Humboldt Bay Harbor Recreation and Conservation District will also be required. Provisions of the permits will be incorporated into the project specifications during the design phase. There will also be construction monitoring by Caltrans environmental planning staff to ensure permit condition compliance.

Temporary erosion control measures during construction will be implemented, such as revegetating disturbed slopes. Additional erosion control measures may be implemented as required in the Storm Water Pollution Prevention Plan as described in Section 3.4 – Water Quality.

After consulting with resource agencies it was determined that the proposed construction options and project alternative is the least environmentally damaging alternative of maintaining the existing bridges. Project impacts to eelgrass, wetlands, and other biological resources will be avoided/minimized to the fullest extent in accordance with Federal and State regulations. Because of mitigation that is expected to be implemented, impacts to biological resources are expected to be non-substantial.

3.9 Socio-Economics

Setting

The Eureka Channel and Middle Channel Bridges and about half of the Samoa Channel Bridge are within the City of Eureka, which has a population of approximately 25,000 and is the largest city on the northern California coast (north of Sonoma County). Route 255 also provides access to the Samoa Peninsula and the City of Arcata (population of approximately 15,000). The areas of Samoa, Manila, and Fairhaven, which include residential and industrial developments, are located on the Samoa Peninsula.

The northwest segment of the Samoa Channel Bridge is within unincorporated County of Humboldt. According to the 1989 County of Humboldt, Humboldt Bay Area Plan, the land use designations adjacent to the Samoa Channel Bridge include Public Facilities, Industrial/Coastal-Dependent, and Commercial Recreation.

According to the 1997 City of Eureka General Plan:

- Indian Island, Daby Island, and the northwestern portion of Woodley Island are zoned Natural Resources (NR); management for fish and wildlife habitat is the principal use;

- The bay channels are zoned Water Development (WD);

- The southeast portion of the Eureka Channel Bridge is located within an area zoned waterfront commercial; principal uses include commercial fishing facilities, and commercial recreation facilities.

Pursuant to the California Coastal Act, any development within the Coastal Zone requires a Coastal Development Permit. The Eureka and Middle Channel Bridges are entirely within the City of Eureka limits; any bridge expansion above the high tide land is within the City Coastal Zone and any bridgework below the high tide line is within the State Coastal Zone jurisdiction. The northwest upland segment of the Samoa Channel Bridge is within the County Coastal Zone and the bridge portions that are submerged (sub-tidal) are within the State Coastal Zone.

The U. S. Fish and Wildlife Service (USFWS) has been authorized to include Indian Island (formerly Gunther Island) as part of the Humboldt Bay National Wildlife Refuge. However, most of the island, including the area adjacent to Route 255, is not actively managed by the USFWS because only a small portion of the island has been purchased and approved for USFWS management. The purpose of the refuge is to preserve and enhance migratory bird habitat, but recognizes the many other uses of the Bay as well. For more information about wildlife on the island, see Section 3.8 - Biological Resources.

Development on Woodley Island includes the Humboldt Bay Harbor Recreation and Conservation District office, U. S. Army Corps of Engineers office, National Weather Service weather station, boat marina, Table Bluff Lighthouse (not in operation), Memorial to Fishermen Lost at Sea, and private businesses. For information about the Woodley Island Marina see Section 3.10 - Marine Transportation. Further development of the Island for recreational opportunities and commercial development is expected over the next five to ten years.

The unincorporated communities of Fairhaven (population 300), Samoa (population 550), and Manila (population 1,000) depend primarily on Route 255 for access to Eureka and interconnecting points south. One operating pulp mill, the Fairhaven Power Company, off-road vehicle park, drag strip, airport, dry docks, Bureau of Land Management off-road vehicle area, U. S. Coast Guard Station, and the Samoa Cookhouse are also located on the peninsula.

There are several public recreation facilities along the bay waterfront used by both tourists and local residents. They include the Adorni Center, an outdoor amphitheater, Carson Mill Park, Clara May Berry Park (adjacent to the Humboldt County Main Library), and Eureka Waterfront walkway and the public boat launch under the Eureka Channel Bridge (on the Eureka Waterfront side). Route 255 itself is a popular scenic alternative to Route 101 between Eureka and Arcata.

Various activities associated with Humboldt Bay directly and indirectly contribute to the local and regional economy. Most commercial shipping and boating relates to forest products and fishing. Commercial fishing is the third largest industry and local seafood processors are closely tied to the fishing industry. Oyster cultivation and herring and crab fish-

ing are the major commercial fishing activities associated with Humboldt Bay. (Oyster maraculture rafts are shown in Exhibit 4.) For information regarding commercial fisheries, see Section 3.8 - Biological Resources in this chapter.

In addition, there are several tourist-related businesses near, and along the Eureka Waterfront such as boat cruises within Humboldt Bay. The peak tourist season in Eureka is approximately Memorial Day Weekend through Labor Day Weekend; especially summer weekends. Major tourist attractions near the Humboldt Bay Bridges include the Samoa Cookhouse, Carson Mansion, Eureka Old Town, and special waterfront events. There are also several annual and special outdoor events at, or near the Eureka Waterfront that draw tourists as well as local residents. Such events include Blues by the Bay and the Dixieland Jazz Festival.

Sport fishing is very active within Humboldt Bay and the open ocean. Non-consumptive activities, such as surfing, boating, nature study, and photography are among the most popular recreational uses of Humboldt Bay. For more information regarding boating, see Section 3.10 – Marine Transportation; for more information regarding pedestrian and bicycle access, see Section 3.11 – Surface Transportation.

Project Effects

The proposed retrofit work is basically a safety enhancement project of an existing essential public facility. The proposed work will not include any roadway widening. Direct surface transportation provided by Route 255 is critical to support present and any future development on Woodley Island and the Samoa Peninsula. The proposed project would enhance present and future development by increasing motorists' safety confidence traveling to and from Eureka, Woodley Island, and the Samoa Peninsula.

Project construction activity would result in temporary increases in noise, vibration, heavy equipment exhaust, bay water turbidity, and possibly dust. The construction activities could cause short-term disruption to residents, businesses, and recreational activities. After consultation with a commercial oyster production operator nearest to the project, it was determined that localized, short-term water turbidity and other construction activities would not affect oyster production.

Since the proposed work consists of only retrofitting the existing bridges, after project construction, the proposed project would not:

- Displace, intrude, or conflict with other surrounding land uses or planned development; the proposed project would not be in conflict with any of the City of Eureka and County of Humboldt General Plan goals and policies; directly or indirectly unplanned land development (i.e. growth inducing impact);

- Promote growth inducement after project completion;

- Result in a change of lifestyles, neighborhood character or stability, nor would it permanently disrupt an established community;

- Affect any agriculture, aqua-culture, timber stands, or farmland;

- Permanently remove, displace, or adversely affect any businesses, residences, or community facilities including proposed and existing Eureka Waterfront development;

- Substantially affect property values or the local tax base;

- Require permanent acquisition of any public parkland, wildlife refuges, or public recreation facilities.

The U. S. Department of Transportation Act Section 4(f) [*49 USC 303* and 23 USC 138] applies whenever a USDOT action involves the use of a publicly owned park, recreation area, wildlife or waterfowl refuge, or land from a historic site. Such land may be used for Federal Aid highways only if there is no prudent and feasible alternative and all possible planning has been taken to avoid the use of a 4(f) property or to minimize harm to any 4(f) property affected by the project. Section 4(f) would not apply to the proposed project for the following reasons:

- There would be no temporary or permanent transportation related use within the U.S. Fish and Wildlife Refuge on Indian Island or the Woodley Island Wildlife Management Area;

- The portion of the City of Eureka operated boat launch facility is entirely within the existing Caltrans right-of-way. Caltrans leases the airspace under the Eureka Channel Bridge to the City with the understanding that the boat launch can be closed for bridge maintenance work;

- During construction, a segment of the waterfront walkway would need to be temporary closed; however a detour will be provided and the overall use of the walkway would remain relatively unchanged during construction.

The proposed retrofit project is within the City, County, and State coastal jurisdictions and Coastal Development Permits will likely be required from the City of Eureka and the California Coastal Commission for this project. During construction public coastal access and recreational activities would be temporarily restricted at the Eureka Channel Bridge near the Eureka Waterfront during construction. For information about the public boating, pedestrian, vehicular, and bicycling access during construction see Section 3.10 - Marine Transportation and Section 3.11 - Surface Transportation.

During construction, construction activities would generate noise and could be an annoying disturbance to recreational activities at the waterfront--especially during special events.

After construction, coastal access, recreation activities, public coastal facilities, and open space would remain virtually unchanged from the pre-construction conditions.

The No-Build Alternative. If the bridges are not fully seismically retrofitted, there is a possibility that they might collapse during a major earthquake resulting in possible fatalities and serious injuries to motorists traveling on the bridges.

Measures to Minimize Harm

Provisions will be made to minimize disruption of vehicular, pedestrian, and boating access during construction to the businesses, residences, and recreation areas. (See discussions under Section 3.10 – Marine Transportation and Section 3.11 – Surface Transportation in this chapter for additional construction information.)

Short-term construction noise would be unavoidable; see Section 3.6 – Noise and Vibration for measures to minimize harm.

The No-Build Alternative. Other than working to ensure public safety and maintaining the remaining portions of Route 255, no measures to minimize harm are proposed at this time for the No-Build Alternative.

3.10 Marine Transportation

Setting

Humboldt Bay is regionally important for recreational and commercial boating. Humboldt Bay is the only harbor for major shipping between San Francisco, California and Coos Bay, Oregon. Commercial marine transportation includes deep-draft shipping, barge traffic, and commercial fishing boats. There are several commercial ship docks and shipping related facilities south and east of the Humboldt Bay Bridges. From approximately Buhne Point up through Arcata Bay, there is adequate bay and channel depth to navigate small boats, even at extremely low tides**.** All boat marinas are outside of the project area. The boat marina on Woodley Island is the largest all season facility on Humboldt Bay and has docking facilities for approximately 300 pleasure and commercial fishing boats. Developed public bay boat access also exists near the Adorni Center and the recently completed major boat marina reconstruction on Waterfront Drive near Commercial Street.

The City of Eureka constructed a public boat launch facility under the south end of the Eureka Channel Bridge. This facility consists of a floating dock, a boat launch ramp, parking for vehicles with boat trailers, and restrooms. Except for a portion of the actual boat launch ramp, this boat launch facility is within the existing Caltrans right-of-way. The City of Eureka signed a Caltrans lease to construct and operate the boat launch.

The City of Eureka is currently implementing a Waterfront Revitalization Program between C and F Streets, which will include a public dock to accommodate cruise ships. Other proposed improvements include a commercial fishing wharf and a trestle public boardwalk.

Portions of Humboldt Bay were recently deepened to allow large ships, including cruise ships, to enter the bay. The U. S. Army Corps of Engineers periodically performs maintenance dredging within portions of the Samoa and Eureka Channels. The dredging operation is outside of the project limits (300-meters or 1,000-feet of the three bridges). Most of the large commercial ships would not pass under any of the Humboldt Bay Bridges because most of the large docks and deep-water channels are southwest of the bridges and the bay mouth is south of the bridges. All three Humboldt Bay Bridges have boat navigation lights mounted on the bridge superstructures. In addition, there are navigation lights on the fender piles near the south end of the Eureka Channel Bridge. For approximate depths of the Eureka, Middle and Samoa Channels, see section 3.3 - Hydrology and Floodplain.

Project Effects

During construction, boats would need to maneuver around barges (carrying construction equipment and materials) and the barge anchor lines. Temporary trestles and cofferdams will be located in shallow waters and not within the deep-water navigation channels. If temporary discharge lines for pumped bay water were used, they would be weighted to rest on the channel bottom. Construction activities could be occurring at one or more of the bridges simultaneously.

The public boat launch under the Eureka Channel Bridge would be closed up to six months during work on the bridge piers within and adjacent to the boat launch. Year round closure of the boat launch during the two to three year construction period would be avoided by utilizing the adjacent vacant lot east of the boat launch complex. A temporary fence with detour signs will direct pedestrians through the construction zone during the launch parking lot area closure period. The Samoa Boat Launch and a new boat launch facility on Waterfront Drive in Eureka would be available to the public as alternatives during the construction period.

Two fender pile structures near the southwest segment of the Eureka Channel Bridge would be removed after construction. Removing these fender piles would eliminate two navigational obstacles. Coordination with the U.S. Coast Guard will be necessary to properly place navigation lights after the existing fender piles are removed at the Eureka Channel Bridge**.** After project construction, the navigable channel widths would remain unchanged from the existing. Most of the boat traffic, particularly large craft, does not cross under any of the bridges to access the northern half of Humboldt Bay (Arcata Bay).

After construction, the deep-water footings would increase in length (parallel to the channels): consequently the width between the bridges' deep-water footings would not be substantially reduced and the project would not impair the existing navigability. The deep-water footings will have pile caps to protect the footings and boats in the event of incidental contact. In addition concrete skirts will be attached to the pile caps to prevent boats from striking the footing piles, especially at low tide conditions. See Section 3.3 - Hydrology and Floodplain for information regarding sediment and water dynamics within the bay.

No-Build Alternative. If one or more of the three Humboldt Bay Bridges collapsed during a major seismic event, they would pose a navigational hazard and impede or completely close access to Arcata Bay (northeast of the existing bridges).

Measures to Minimize Harm

Navigational access under the bridge will be maintained as required by the U. S. Coast Guard. The construction contractor will be required to maintain at least fifty-percent of the navigable channels for boat access at all times. Coordinating with U. S. Coast Guard, temporary marine aids to navigational, such as buoys and signs, will be placed as needed to warn boaters of obstructions during construction. If appropriate, advance notice of construction work in the channels will be submitted to the U. S. Coast Guard for inclusion in the Local Notice to Mariners. After measures to minimize harm are implemented, overall potential effects on marine transportation during project construction would be short-term and minor. In addition, Caltrans staff will coordinate with the Humboldt Bay Harbor Recreation and Conservation District regarding any activities affecting boat navigation during construction.

The boat launch will be restored to its original operating condition after project construction.

3.11 Surface Transportation

Setting

Regional Highways. State Route 255 is the only continuous highway linking Route 101 in Eureka, Woodley Island, and the Samoa Peninsula. The annual average daily (24-hour period) traffic volume on the bridges is approximately 7,700 vehicles. Commercial trucks comprise approximately 8-10% of the total vehicles on the bridges. Route 255 intersects Route 101, a principal arterial highway in Eureka. Since Route 255 also connects to Route 101 in Arcata, Route 255 provides an alternate to Route 101 between Eureka and Arcata.

Other local roads. Waterfront Drive crosses under the Route 255 Eureka Channel Bridge at the Eureka Waterfront. This road provides access to the public boat launch and park-

ing lot under the Eureka Channel Bridge. Startare Drive, which intersects Route 255 on Woodley Island, provides the only road access to a boat marina and island businesses. Vance Avenue crosses underneath the Samoa Channel Bridge on the Samoa Peninsula and intersects Route 255 approximately 0.8 km (0.5 mile) northeast of the Route 255/Navy Base Road intersection.

Navy Base Road intersects Route 255 at the northwestern end of the Samoa Channel Bridge and provides access to Fairhaven, Samoa, U. S. Coast Guard building, boat launch, BLM recreational land, the Eureka Municipal Airport, and the southern tip of the Samoa Peninsula. Navy Base Road also provides an important transportation link between commercial watercraft loading and off-loading goods and trucks transporting watercraft transported goods locally and regionally.

Public Parking. The off-street parking lot between the Adorni Center and outdoor amphitheater and the boat launch parking lot under the Eureka Channel Bridge provides most of the public parking for the Eureka Waterfront. The City of Eureka owns a partially paved vacant lot east of the boat launch parking lot. On-street parking is not allowed on Route 255 and Waterfront Drive. Limited on-street parking exists on segments of Vance Avenue and Navy Base Road at the northwest end of the Samoa Channel Bridge. Except during special events, the existing public parking availability generally meets the demand for public parking in the vicinity of all three bridges.

Public Transit. The Humboldt Transit Authority operates a regularly scheduled daily bus route providing service connecting Eureka, Arcata and the Samoa Peninsula. School buses also regularly use the three bridges.

Pedestrian Facilities. Currently pedestrians can walk on the Eureka Channel Bridge between the Eureka waterfront and Woodley Island. Pedestrians are not allowed on the other two bridges. All three bridges have 1.2-meters (four-foot) wide shoulders on both bridge sides but they were designed for bridge maintenance personnel and not pedestrians.

Vance Avenue, Startare Drive, and Navy Base Road do not have sidewalks. Waterfront Drive has a sidewalk only the northside (bayside) of the street.

A public shoreline walkway follows the Eureka Waterfront from the Adorni Center to the west; provides access to an outdoor amphitheater, Carson Mill Park, and to the City Boat Launch under the Eureka Channel Bridge. The walkway continues east of the boat launch and eventually terminates at a small public parking lot. (See Exhibit 13 - Temporary Access and Work Area at Eureka Channel Bridge.) The City of Eureka has plans to extend this walkway west of the Adorni Center.

Bicycling. Bicyclists are permitted on State Route 255 (including all three Humboldt Bay Bridges) as well as the local streets. Waterfront Drive has bike lanes connecting to an overall Eureka bikeway network.

Railroad. North Coast Railroad Authority owns a continuous loop around the northern portion of Humboldt Bay, which crosses under both the Eureka Channel and Samoa Channel Bridges. As of this writing, the segment of railroad within the project limits is not in working operation and is in need of major repair work. It is not known whether the railroad on either the Eureka or Samoa peninsula sides would be in use during the two to three-year project construction period.

Project Effects

Construction. Project construction is expected to require two to three years to complete. Construction activities are expected to generate up to 12,000 cubic meters (16,000 cubic yards) of excavated and drilled material. Most of this material will be stockpiled and then used as backfill. It is anticipated that approximately 3,800 m^3 (5,000 cubic yards) of this excavated material cannot be used as backfill. This material will be considered excess and will be transferred to one or more designated approved disposal sites. Many truck trips would be required to transport this excess material from the project area. However, the material would be transported and disposed over a period of two to three years: this would minimize localized traffic disruption and noise caused by large trucks accessing the project area.

Regional Highways. During construction, one lane of traffic on Route 255 might be occasionally closed for trucks to pour concrete from on top of the bridges to the bridge substructure elements. Minor delays are expected, but passage of vehicles, bicyclists, and pedestrians will be accommodated. Route 101 would not be substantially affected during or after construction.

Other Local Roads. T Street and Front Street would serve as the primary access to the five landlocked Eureka Channel Bridge piers on the southwest end of the bridge. Waterfront Drive and the Caltrans right-of-way located under the bridge would serve as an alternate access. Work at one bridge pier would affect Waterfront Drive for one to two months and may subject motorists to occasional one way traffic control. An encroachment permit will be needed for traffic control signing on Waterfront Drive approaching the Caltrans right-of-way.

Public Parking. During construction, the boat launch public parking lot under the Eureka Channel Bridge would temporarily close during construction at the five landlocked bridge piers. The boat launch and parking lot will be open for the remainder of the construction periods. The vacant lot east and adjacent to the boat launch parking lot is expected to be closed during the entire two to three year construction period. The Samoa Boat Launch and a new boat launch facility on Waterfront Drive in Eureka would be available to the public as alternatives during the construction period. The parking area serving the Adorni Center would not be affected during and after construction and is the most important parking area near the bridge. After construction, there would be no net loss of public parking spaces.

Public Transit. Since all roads will remain open during construction, including Route 255, any public transit delays would be temporary and minimal during construction. After construction, roadway conditions would return to pre-construction conditions.

Pedestrian Facilities. During construction the City boat launch complex under the Eureka Channel Bridge would be temporarily closed. Pedestrian access to the Eureka Boat Launch could be restricted for up to six months during the work on the bridge piers within, or close to, the boat launch. A temporary fence will be placed to direct pedestrians through the boat launch facility construction zone. After construction any sidewalks or walkways will be restored to original condition. Additional sidewalk construction or sidewalk widening on the bridges is not included in this project.

Bicycling. The bike lane on Waterfront Drive may be temporarily closed for the duration of the bridge footing work at the south end of the Eureka Channel Bridge. Measures will be implemented to allow bicyclists to continue to safely use the roadway during the temporary bicycle lane closure.

Railroad. Prior to construction, a railroad agreement would need to be obtained to work within the Northwestern Pacific Railroad right-of-way at both the Eureka Channel and Samoa Channel Bridge locations. Any construction effects on the railroad would be minor and temporary. Construction work will not interrupt railroad use.

No-Build Alternative. If the bridges are not seismically retrofitted, there is a high probability they would collapse as a result of a maximum credible earthquake (7.5 magnitude). If one or more bridges collapsed during a major seismic event, highway access between Eureka, Woodley Island, and the Samoa Peninsula would be severely disrupted. (See Section 1.3 - Project Need for more information.)

Measures to Minimize Harm

The following strategies to minimize construction effects may include the following:

- Attempt to minimize traffic delay on Route 255 by not closing traffic lanes during peak traffic periods;
- Provisions to minimize disruption of pedestrian and vehicular access, deliveries, and parking during construction;
- After retrofit work, restore the public boat launch public parking lot under the Eureka Channel Bridge to at least its present condition or better since it will be re-paved and re-striped;
- Provide a temporary pedestrian and bicycle detour around the construction area at the Eureka Waterfront;

- Notifying property owners, businesses, and residences within the project limits of construction schedules.

After implementation of measures to minimize harm, transportation effects during and after construction would be minor.

3.12 Public Facilities, Utilities, and Services

Setting

There are various utilities within the public boat launch complex under the Eureka Channel Bridge, including water, sewer, and electrical lines. An electrical line parallel to all three bridges provides electricity for roadway lighting and boat navigation lights. There are also conduits connecting seismic sensors to control boxes and seismic gates on all three Humboldt Bay Bridges.

Because State Route 255 is the only direct land access to Woodley Island and the Samoa Peninsula from Eureka, this is a critical highway in terms of fire department, ambulance, and law enforcement emergency response time and access.

Project Effects

As described in Section 3.11 – Surface Transportation, there would be occasional one lane traffic closures on the three bridges and Waterfront Drive, which could delay emergency service response time. The existing utilities would not be interrupted or affected during construction. See section 3.10 – Marine Transportation for information regarding the bridges' navigation lights.

Measures to Minimize Harm

The fire department, ambulance centers, County Sheriff and California Highway Patrol will be notified in advance of construction work schedules and possible delays.

The proposed project does not include any work to expand any existing utilities or increase the vehicle carrying capacities of the bridges. Selection of the No-Build Alternative may eventually result in substantial emergency vehicle response time delay compared to implementation of the proposed project if the bridges are permanently closed for safety reasons or because of collapse.

The project effects on utilities and services are expected to be temporary and minimal; consequently no measures to minimize harm are required.

3.13 Visual Quality

Setting

Except for the southern end of the Eureka Channel Bridge and the northwestern end of the Samoa Channel Bridge, the three Humboldt Bay Bridges are located within a predominately natural bay setting. The bridges are not overly intrusive within this natural setting because they are proportionately in scale with the surrounding environment and have relatively non-obtrusive features. Besides the open bay waters, inter-tidal mudflats and unobstructed views of the sky, other important visual features near, or adjacent to the bridges include Woodley and Indian Islands, Eureka Waterfront, and distant views of mountains.

The Eureka Channel Bridge has the greatest number of foreground and middle ground views from land, along with the greatest number of potential viewers compared to other bridges because of its close proximity to the Eureka Waterfront. The Eureka Channel Bridge can be seen from the south side of Woodley Island and the Eureka Waterfront area, which includes, a public boat launch, Eureka Waterfront walkway, bicycle lane, the Carson Mill Park, the Humboldt County Main Library, and residents. Foreground views from land of the Middle Channel Bridges are virtually non-existent because of limited road and pedestrian access. Samoa Channel Bridge foreground and middle ground views from the Samoa Peninsula exist, but there are far fewer potential viewers and surrounding public facilities compared to the Eureka Channel Bridge.

Viewers from watercraft on the bay can see all three bridges from varying angles and distances. Humboldt Bay was recently deepened to allow large ships, including cruise ships, to enter the bay.

Project Effects

A visual assessment study for this project included a discussion of the existing visual quality of the project area; identification and analysis of project effects; and measures to minimize harm.

The footings and columns would be enlarged and encased with concrete. Consequently these elements would be more visible than the existing footings and columns, especially at close range. Not all of the footings would be visible after the retrofit, since most of the shallow water and landlocked footings would be entirely below ground.

Exhibits 9 through 12 are photographs show the existing condition and photograph-simulations of the bridges after they are retrofitted. Note that because of changing tidal conditions, the footings and columns would be both more and less visible than in the photograph-simulations depending on the tidal condition.

Because the columns and footings would be enlarged, there would a slight reduction of views between the bridge columns. Views of Indian Island from the Eureka Waterfront and the south side of Woodley Island would not be affected.

Generally views from the three bridges would not change after project construction since the work is entirely below the bridge decks.

Since the project involves the retrofit work of existing bridges without permanently affecting the natural landforms, removing buildings, realigning or widening the roadway, the proposed project will not substantially alter the existing scenic qualities.

Three mature trees would need to be removed near the Eureka Channel Bridge abutment on Woodley Island to construct a temporary access road. (See Exhibits 5 and E-1, which indicate the trees to be removed and Exhibit C-5, which shows the location of the proposed access road; NOTE: in Exhibit C-5, the access road is labeled, "Land access to trestles.") The trees consist of one eucalyptus and one Monterey cypress on one side of Route 255 and on the other side of highway, a single large Monterey cypress directly opposite of the other two trees. These trees possess scenic qualities by framing travelers' views from State Route 255 in both directions. The three trees to be removed are within the existing Caltrans right-of-way and on the existing roadway fill.

Measures to Minimize Harm

A team of bridge design engineers worked with landscape architects during the bridges' retrofit designs to minimize changes in bridge appearances. As a result, the final post-construction appearance of the bridges is expected to be visually compatible with the existing bridges and the surrounding bay setting. The visual enhancement design improvements are summarized in the following measures to minimize harm:

- The footing and column shapes and material were designed to match the existing footing and column shapes on all three bridges at an additional cost of $1.6 million;

- Concrete skirts which would tie into and match existing skirts on the deep water footings; the skirts would visually screen the footing piles;

- The Middle Channel Bridge retrofit design is different than the other two bridges; all shallow water footings were re-designed to match the deep water footings to increase visual unity of the bridge;

- Two existing wooden fender pile structures would be removed near the Eureka Waterfront, which would expand the bay view and improve the overall bridge appearance (a fender pile is shown in Exhibit 9);

- At each bridge the existing seismic gates, along with the corresponding antenna towers, controller boxes, electronic signs, would be removed after construction. The existing seismic sensors on each bridge, which are currently connected to the seismic gates, would remain after substructure retrofit completion;

- Native trees will be planted to replace trees removed during construction.

The existing footing near the Eureka Channel Boat Launch is currently discolored from tidal conditions and textured from marine organisms such as barnacles (see Exhibit 10). The proposed retrofit work would include adding new concrete to the existing footing and would at first visually contrast with the existing footing. Cleaning the existing footing near the Eureka Boat Launch would help blend the existing footing with the proposed enlargement of the footing. After measures to minimize harm are implemented and because of the nature of the proposed work, the reduction in visual quality is expected to be minimal.

3.14 Pre-Historic and Historic Resources

Setting

An Area of Potential Effects (APE) for the proposed project was established in consultation with the Federal Highway Administration to identify and evaluate pre-historic and historic resources. The APE includes the three bridges, work trestles, and a tentative access and work area. The Indian Island shoreline is not included in the APE because the February 1999 Hydrodynamic, Sedimentation and Bridge Scour Analyses of Samoa Channel, Middle Channel and Eureka Channel Bridges, Humboldt Bay, California, indicates the project does not have the potential to increase erosion along the adjacent shoreline. Qualified Caltrans staff performed prehistoric and historic studies within the proposed project APE.

Paleontological Resources. A mammoth tooth was recovered from an archaeological site on Indian Island sometime between 1860 and 1913; although the deposition of this fossil is uncertain, the tooth is likely to have been carried to the site by Wiyot inhabitants from Pleistocene non-marine deposits at least five km (three miles) from the existing bridges. Submerged fossilized trees were identified at both north and south ends of Humboldt Bay. No evidence of similar fossil deposits were identified during coring conducted within the project area by Dr. Gary Carver, former Humboldt State University geology professor. The proposed project area is not considered sensitive for paleontological resources. (Source: Personal communication with Dr. Gary Carver.)

Pre-Historic Archaeological Resources. Four prehistoric/historic Native American archaeological sites, CA-Hum-23, 63, 64, and 67 are adjacent to the proposed project APE. All four are Wiyot village locations. CA-Hum-67 is listed on the National Register of Historic Places and is a National Historic Landmark. None of these resources is within the project APE.

Historic Archaeological Resources. The Dolbeer and Carson Lumber Company Mill and Lumber Yard, the Eureka/Acme foundry, and Carson's Landing/Little River Redwood company wharf are within and adjacent to the project APE. None of the resources appear eligible for inclusion on the National Register of Historic Places. No further research or studies are suggested for these resources.

Architectural History. The proposed project APE is outside of the National Register Old Town Historic District. The three Humboldt Bay Bridges were constructed in 1971 and are listed as ineligible for the National Register of Historic Places (NRHP) in the 1986 Caltrans historic highway bridge inventory. Clement (1998) reevaluated the three bridges and concluded that they do not appear eligible for the NRHP or the California Register of Historical Resources (CRHR). Although the bridges are located within the Humboldt Harbor Historic District (California State Landmark No. 882 and listed on the CRHR, and also listed on the California Inventory of Historic Resources) they are outside of the district's period of significance and are unrelated to the district's themes: exploration of the bay, founding of surrounding settlements, importance as a major North Coast lumber port, and as a shipbuilding center. There are no buildings, other than a public restroom, within the proposed APE.

Other Historic Resources. The proposed project APE includes the Northwestern Pacific Railroad (NWPRR) at two locations. The NWPRR between Marin County and Eureka appears eligible for the National Register of Historic Places as a district. Segments of the NWPRR within the proposed project APE appear to be eligible for inclusion on the National Register as contributing elements to a possible NWPRR historic district. One branch of the NWPRR is within the proposed APE beneath Samoa Channel Bridge on the Samoa Peninsula (see Exhibit 4). A second railroad branch within the APE crosses under the southern end of the Eureka Channel Bridge (see Exhibit 3).

Project Effects

Paleontological Resources. The proposed project area is not considered sensitive for paleontological resources and therefore no project impacts or effects are anticipated during project construction.

Historic Resources. The Samoa Channel Bridge is partially within an easement from the NWPRR. Construction earthwork within the railroad easement will not encroach onto the railroad embankment. Construction access across the tracks to temporary trestles will also be required at this location. Gravel will be placed up to tracks on both sides of the rails and temporary wooden timbers will be laid between the tracks. The proposed crossing design will allow uninterrupted use of the rails by the NWPRR. These crossings may remain in place throughout the retrofit of the Samoa Channel Bridge, but will be removed at the conclusion of construction. The proposed work is a temporary use of a small and non-distinctive segment of the NWPRR; it will not adversely affect the characteristics that qualify the property for inclusion on the National Register of Historic Places.

The proposed seismic retrofit work at the Eureka Channel Bridge will not affect the NWPRR segment at this location; construction will not intrude into the railroad right-of-way.

Caltrans prepared a Historic Property Survey Report (HPSR) which includes a discussion of the historic and pre-historic study findings and a determination that the proposed project would not have an adverse effect on any significant cultural resources within the APE. The HPSR was transmitted to the State Historic Preservation Officer (SHPO) for review and concurrence. Exhibit 16 is a letter of concurrence sent to Caltrans from the SHPO.

Measures to Minimize Harm

Caltrans and construction contractor personnel will be advised as to the sensitivity of all cultural resources near, or adjacent to the three bridges. Culturally sensitive areas outside the work zone will be designated as environmentally sensitive and will be off limits to all construction activities, construction personnel, and material or equipment storage. During work at certain locations, cultural resource monitors will be present.

Caltrans discussed the project with representatives from the Table Bluff Reservation of Wiyot Indians, Blue Lake Rancheria, Bear River Band of Rohnerville Rancheria, and Humboldt Bay Maritime Museum.

A candlelight vigil is held annually on Woodley Island in memoriam to the victims of the February 26, 1860 massacre on Indian Island; this observance is on the last Saturday of February. The twenty-four hours before and after the vigil, as well as during the ceremony, will be a no work period for all construction on the seismic retrofit project.

Exhibit 16 – State Historic Preservation Office Letter

STATE OF CALIFORNIA – THE RESOURCES AGENCY

GRAY DAVIS, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
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November 2, 2000

REPLY TO: FHWA001010A

Deborah L. Harmon, Chief
Environmental Management Office
P.O. Box 3700
EUREKA CA 95502-3700

Re: Seismic Retrofit of Humboldt Bay Bridges, State Route 255, Humboldt County.

Dear MS. Harmon:

Thank you for submitting to our office, on behalf of Federal Highway Administration (FHWA), your October 6, 2000 letter, Historic Property Survey Report (HPSR) and Finding of Effect regarding the proposed seismic retrofitting of three bridges spanning Humboldt Bay on State Route 255 in Humboldt County. The California Department of Transportation (Caltrans), on behalf of FHWA has identified the structures as Bridges #04-228, 04-229, and 04-230. The proposed seismic retrofit modifications to these structures are being implemented in accordance with the March 1995 "Programmatic Agreement Regarding the Seismic Retrofit of Bridge Structures in California" (Seismic Retrofit PA). The proposed project will include the following activities:

- Strengthening the bridge foundations by placing a reinforced 18-inch-thick concrete top mat on each of the 41 pier footings or pier pile caps and adding reinforced concrete casings on all pier columns.
- The addition of four 36-inch to 60-inch cast-in-steel shell piles to all deep-water piers for all three bridges.
- The addition of four additional 24-inch and 36-inch cast-in-steel shell piles to the shallow water pier footings at Bridges #04-228 and #04-229.
- The addition of 24-inch and 36-inch cat-in-steel piles for the shallow water piers at Bridge #04-230.
- The construction of temporary cofferdams filled with concrete seal courses to isolate the work at the shallow water piers. Concrete precast skirts will be attached around the deep-water pile caps.
- Providing work access through the use of temporary coffer dams and trestles for the shallow water piers and barges and trestles for the deep-water piers. The trestles and cofferdams will be removed in their entirety upon retrofit completion.

The Area of Potential Effects (APE) for the proposed project appears adequate and meets the definitions set forth in guidance provided by 36 CFR 800.16(d).

On behalf of FHWA, Caltrans is seeking our comments on FHWA's determination of the eligibility of four pre-1950 properties located within the project APE for inclusion on the National Register of Historic Places (NRHP) in accordance with guidance set forth in 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act and Stipulation XI of the 1995 Seismic Retrofit PA. The properties include the following:

- The Dolbeer and Carson Lumber Company Mill and Lumber Yard on the Humboldt Bay waterfront between M and S Streets in Eureka.
- The Eureka/Acme Foundry located on the Humboldt Bay waterfront at the foot of S Street in Eureka.
- The Little River Redwood Company and Carson's Landing located on the Humboldt Bay waterfront south of Old Navy Base Road near Bridge #04-228 in Samoa.
- Segments 1 and 2 of the Northwestern Pacific Railroad (NWPRR) both located within the project study area. Segment 1 is approximately 100 feet in length and Segment 2 is about 10 feet in length.

Caltrans is also seeking, on behalf of FHWA, our comments on FHWA's determination of the effects the proposed project will have on historic properties in accordance with 36 CFR 800 and Stipulation XI of the 1995 seismic Retrofit PA. Our review of the submitted HPSR leads us to concur with the FHWA's determination of the following:

- That the aforementioned Segments 1 and 2 of the NWPRR appear eligible for inclusion on the NRHP as contributing elements to a larger potential NWPRR Historic District under Criterion A as defined in 36 CFR 60.4. The segments appear to have strong associations with the NWPRR's involvement with the expansion of the redwood lumber industry and the expansion of commerce in the Humboldt Bay region during the period from 1893 to 1950. In the event a complete study of the entire NWPRR from Tiburon in Marin County to Eureka has been conducted, we will provide formal comments on its NRHP eligibility at that time. However, for the purposes of this project, it is recommended that the properties be treated as eligible for inclusion on the NRHP.
- The Dolbeer & Carson Lumber Company, the Little River Redwood Company and Carson's Landing, and the Eureka/Acme Foundry are not eligible for inclusion on the NRHP under any of the criteria established by 36 CFR 60.4. The properties have no strong associations with significant historical events or persons, and are not examples of outstanding architectural or engineering design or function. In addition none of the properties have retained sufficient integrity of design, materials, workmanship, and feeling associated with their historic periods of significance.

- Our review of the HPSR and Finding of Effect documentation leads us to concur with FHWA's determination that the proposed project, as described, will have no adverse effect on the aforementioned NWPRR segments. The proposed work will not significantly alter or change those characteristics that may qualify the historic property for inclusion on the NRHP.

Thank you again for seeking our comments on your project. If you have any questions, please contact staff historian Clarence Caesar at (916) 653-8902.

Sincerely,

Daniel Abeyta, Acting
State Historic Preservation Officer

Chapter 4 Cumulative impacts

Any short-term or long-term indirect effect on growth inducement after project completion would be very minimal: the project would not increase or expand traffic access and the project was designed to insure long-term motorist safety during a major earthquake event.

The potential cumulative loss of wetland, inter-tidal mudflats, and eel grass would be avoided, minimized, or compensated by implementing the proposed mitigation measures: no adverse cumulative effects are expected.

Chapter 5 List of Preparers

The following Caltrans and FHWA staff contributed to the preparation of this environmental document:

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FHWA Staff:

George Wishman
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Chapter 6 References

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WEST Consultants. Hydrodynamic, Sedimentation and Bridge Scour Analysis of Samoa Channel, Middle Channel and Eureka Channel Bridges Humboldt Bay, California. Prepared for Caltrans. February 1999.

Persons consulted:

Brent Siemer, Sidnie Olson, David McGinty, Dan Moody,
Michael Zoppo, City of Eureka
Michael Wheeler, Michelle Nielsen, County of Humboldt
Dave Hull, Matt Wardynski, Jeff Robinson,
Humboldt Harbor Conservation and Recreation District
David Ammerman, U. S. Corps of Engineers
Jerry Olmes, U. S. Coast Guard
Gary Carver, Former Humboldt University Geology Professor
Emily Dean, Tom Dunbar, Regional Water Quality Control Board
Nan Reck, Mike Kelly, Brian Mulvey, National Marine Fisheries Service
Randy Brown, Ray Bosch, U. S. Fish and Wildlife Service
Debbie Hart-Harris, California Coastal Conservancy

Becky Ota, Herb Pierce, Vicki Frey, California Department of Fish and Game
Robert Merrill, Tiffany Tauber, Steven Stanley, California Coastal Commission

Appendix A Consultation and Coordination

Caltrans staff will obtain permits for the proposed work from all responsible public resource agencies including the U. S. Army Corps of Engineers, Regional Water Quality Control Board, and the Humboldt Bay Harbor Recreation and Conservation District. In addition work will be coordinated with the U. S. Coast Guard. If appropriate, coordination with one or more of these agencies will continue prior to, during, and after project construction. Coastal development permits from the City of Eureka, California Coastal Commission, and possibly County of Humboldt, will also be required. The coastal permit process generally provides an opportunity for public comment before approval.

Caltrans held three meetings with public agencies to identify environmental issues, discuss environmental documentation, and discuss relevant resource agency permit issues. These meetings were held in the Caltrans District 1 Office Building on July 9, 1997, February 19, 1998, and November 9, 1999. Representatives from the California Department of Fish and Game; U. S. Army Corps of Engineers; California Coastal Commission; U. S. Fish and Wildlife Service; City of Eureka, County of Humboldt; U.S. Coast Guard; National Marine Fisheries Service; and Federal Highway Administration attended at least one of the three meetings. Caltrans also held numerous informal meetings with these resource agencies.

Based on these meetings, Caltrans and Federal Highway Administration (FHWA), the lead agency, jointly decided to proceed with the preparation of a draft Environmental Assessment (EA) document followed by a final EA/Finding of No Significant Impact (FONSI) document. These meetings provided Caltrans and FHWA feedback regarding the overall project, environmental studies, and the project alternatives.

Caltrans held two public meetings during development of this project to solicit comments, answer questions, and discuss issues. The first meeting was on May 5, 1998 at the Adorni Center in Eureka and a subsequent meeting was held on June 21, 2001 at Peninsula School, in the community of Samoa. The second meeting coincided with the public circulation of the draft environmental document.

Approximately twelve people attended the first meeting in 1998. The open house provided the public an opportunity to review project displays and other project information. (The proposed project at the time of the meeting has since been scaled down. For more information see Alternative 5 in Section 2.3 – Project Alternatives.) Caltrans staff received both written and verbal comments.

A public notice announcing project information availability and the public open house was printed twice in each of the following newspapers: Times-Standard - April 15 and May 1,

1998; Arcata Eye - April 14 and 28, 1998; and the Humboldt Beacon - April 16 and 30, 1998. See Exhibit A-1 - Public Meeting Notice.

The following is a summary of the verbal comments and questions directed to Caltrans staff at the meeting. Many verbal comments were also submitted formally in writing; for the purpose of brevity, in cases where the verbal and written comments are the same or very similar, only the written comments are summarized in the written comment section following the verbal comment section.

Summary of verbal comments:

1. There were questions and comments regarding the operation of the boat launch and public parking under the Eureka Channel Bridge. Also one individual requested the installation of a middle dock to efficiently accommodate incoming and outgoing boats if the boat launch is relocated. (The proposed project will not require relocating the boat launch.)

2. One individual requested that the proposed footing top mats incorporate useful features such as boat dock ties, seal/sea lion haul-outs, picnic areas, or flowerbeds.

3. It was suggested Caltrans provide a copy of the Eureka Channel Bridge Visual Assessment and the Caltrans prepared displays for the U. S. Army Corps of Engineers permit submittal at the Humboldt County Main Library.

4. One individual mentioned that any decisions regarding placing a texture (or creating a substrate for marine organisms) on the columns or footings consider continuing to provide recreational boaters the opportunity to grasp the piers/footings.

5. One person mentioned the importance of maintaining bicycle travel on all three bridges during construction.

Summary of comment cards and letters received during the public comment period:

A total of eight formal written comments (five comment cards, three letters) were submitted during the public comment period. The following is a brief summary of the written comments (most individuals made more than one comment):

- Two individuals opposed the project and one individual questioned the project because of the relatively high cost and environmental impacts. Environmental concerns included potential negative effects to eelgrass and wetlands.

- One individual wanted a bridge linking Herrick Road (in Eureka) to the north jetty of

the Samoa Peninsula instead of the retrofit.

- Three people expressed concern regarding the importance of maintaining the existing boat launch operation during construction.

- One person was concerned about the aesthetics of the footings/top mats/skirting and wanted designers to consider sloped/rounded edges.

- One person requested that the project include texturing the footings/skirting/top mats to promote sea life.

- One person requested that the project include a bikeway/pedestrian walkway on both sides of all three bridges or at least on the Eureka Channel Bridge.

The formal comment period closed on May 15, 1998.

All verbal and written comments from the May 5, 1998 public open house were considered, and if appropriate, are addressed in this Environmental Assessment document. A complete record of the public open house is available for review at the Caltrans District 1 Office in Eureka.

The draft environmental document, or Environmental Assessment (EA), for the proposed project was approved on May 18, 2001 for public circulation and comment. The EA was available to the public three weeks before a public meeting was held on June 21, 2001 at Peninsula School, in the community of Samoa, Humboldt County. The meeting provided an opportunity for the public to provide comments on the EA, review the latest project information displays, and ask questions before Caltrans and the Federal Highway Administration finalized the environmental document. The public meeting followed an informal open forum format with no formal presentations or group audience question and answer period. Formal comments were individually submitted on comment cards and letters. There were no resolutions or petitions received during or after the public comment period. Approximately sixteen people attended the meeting.

Newspaper Public Notices and Articles:

A public notice announcing the availability of the draft environmental document and the associated public meeting was printed twice in the Times-Standard newspaper on June 5, 2001 and on June 14, 2001. (See Exhibit A-2.) In addition a press release version of the public notice was sent to local television and radio stations as well as other local newspapers.

In addition to the public meetings, project information and displays were available at the year 2000 and 2001 Humboldt County Fairs in Ferndale.

Summary of questions and comments at the meeting:

There were representatives from the local fire department asking about emergency access to the temporary trestles and barges in event of a worker injury or accidental hazardous material spill.

Comment cards and letters:

There were six letters and four comment cards submitted during the draft environmental document circulation and review period. Copies of the comment cards and letters are included in this document as well as Caltrans' responses to these written comments. The public comment period closed on July 5, 2001. The following organizations and individuals submitted written comments:

U. S. Environmental Protection Agency
California Department of Fish and Game
California Coastal Commission
Melvin McKinney, representing the Sierra Club and Northcoast Environmental Center
Ken Bates, commercial fisherman
Lowell Allen, a retired Caltrans employee
Dave Wilson, a retired Caltrans employee
Ken Vollenweider, representing the Samoa Peninsula Fire District

NOTE: A letter was submitted by the Table Bluff Reservation Wiyot Tribe regarding this project; because this letter was marked confidential, a copy of this letter is not included in this document; please contact Barry Douglas, the Caltrans District 1 Archaeologist, at 707-445-6417 if you have any questions.

Attached are copies of all letters received during the Humboldt Bay Bridges Seismic Retrofit environmental document circulation period. Corresponding Caltrans written responses follow the letters and are referenced by numbers in the right margins of the letters.

A complete record of the June 21, 2001 public meeting is available for review at the Caltrans District 1 Office in Eureka.

Caltrans Responses to Letters

The following Caltrans responses correspond to the numbers in the right margins of the letters received from public agencies and individuals:

1. Caltrans staff estimated the dimensions of the trestles partly for the purpose of determining the quantity of temporary effects to eelgrass and mudflat. The estimates were a worst-case but realistic situation to avoid underestimating the temporary effects of the trestles and trestle piles. The trestle dimensions shown in Exhibits C-5, 6, 7, and 8 in Appendix C are preliminary and are subject to modification during the public agency permit process. Only chemically non-reactive, inert materials such as metal or untreated timber will be permitted for the temporary trestle piles.

2. Caltrans has identified a designated disposal site within the existing Route 101 right-of-way near Rio Dell for use by the construction contractor. This disposal site was surveyed and no listed species/habitat under the Federal Endangered Species Act were found. This site is also outside of the Coastal Zone. Appropriate Best Management Practices will be incorporated to prevent erosion/run-off before, during and after disposal operations.

   If the construction contractor elects not to use the designated disposal site, the Caltrans Standard Contract Specifications will apply. The Specifications state in part:

   > "If the Contractor elects to dispose of materials at locations other than those where arrangements have been made by the Department, or, if material is to be disposed of and the Department has not made arrangements for disposal of the material, the Contractor shall make arrangements for disposing of the materials outside the highway right of way and shall pay all costs involved. Arrangements shall include, but not be limited to, entering into agreements with property owners and obtaining necessary permits, licenses and environmental clearances. Before disposing of any material outside the highway right of way, the Contractor shall furnish to the Engineer satisfactory evidence that the Contractor has entered into agreements with the property owners of the site involved and has obtained the permits, licenses and clearances."

   Caltrans will serve on behalf of the lead federal NEPA agency and direct the construction contractor to follow the appropriate environmental and permit processes: this includes making a determination that the alternate site would result in no additional environmental damages as compared to the designated site.

   An area for de-watering excavated material will be available for the construction contractor as indicated by area labeled "temporary construction work area" in Exhibit 13. Should the contractor choose to use the available work area, the contractor would be required to place a fabric barrier and gravel to maintain a separation between project activities and original ground. Paving this area would not be allowed, however Best Management Practices will be required to confine and control storm water run-off and

facilitate greater efficiency for spill control and containment.

Infiltration basins may be used for de-watering of excavated sediments, however, this Best Management Practice could only be implemented at an off-site location, as the use of infiltration basins will not be allowed within the available work area or within Caltrans right-of-way. The contractor could choose to use de-watering tanks as a means of de-watering sediments. Several types of de-watering tanks are currently available on the market. Typically, these tanks are equipped with filters that separate water from the excavated sediments with the sediments retained in the tank for disposal. Manufacturers claim that in on-site tests and tests under simulated field conditions particles above 8 micrometers were reduced by 99.4%. Particles ranging down to 1 micrometer were reduced by 79.4% at a flow rate of 380 liters (100 gallons) per-minute.

Caltrans will also provide one or more designated material storage sites to the construction contractor. Any designated storage site will be surveyed for listed species/habitat under the Federal Endangered Species Act. Also a storage site will not be designated unless it has the appropriate environmental documentation and regulatory permits for temporary stockpile of drilled and excavated bay material. The designated site(s) will be disclosed during the regulatory permit process.

If the construction contractor elects not to use the designated staging/storage site(s), the contractor will be responsible for obtaining all environmental document and permit approvals for any alternative sites as stated in the disposal site discussion.

3. Turbidity control measures are proposed as a required mitigation measure for anticipated excavation in the Eureka Channel at piers E-11 through E-15. At this location, the vertical clearance from the bridge superstructure is insufficient to allow the use of conventional sheet pile driving equipment. The area proposed for open excavation is included in the eelgrass and mudflat impact discussion in Chapter 3 of this document.

   In anticipation of expected permit compliance requirements to be set by the North Coast Regional Water Quality Control Board, excavation would require turbidity control measures which may consist of silt curtains, water bladder walls, or any other control measures available to the contractor. Several companies manufacture silt curtains which can be designed for a marine environment with tidal fluctuations. The curtains generally consist of a heavy vinyl coated fabric material equipped with tension cables and ballasts for support. Water bladder walls are essentially large tube-like structures consisting of polyethylene inner walls providing support surrounded by a heavy duty, woven, polypropylene fabric for durability. The inner walls are filled with water, which provide weight and rigidity to the wall structure. Water bladder walls were successfully used for bridge retrofit work at the Mad River Bridge.

   The turbidity barrier(s) will be placed around the entire area to be excavated (i.e., piers E-12 through E-15). The contractor may choose to employ the use of specialized pile driving equipment which would obviate the need for turbidity control meas-

ures outside of the proposed use of cofferdams.

Water quality objectives and beneficial uses for Humboldt Bay are set for in the Water Quality Control Plan for the North Coast Region (i.e., Basin Plan). With regard to turbidity the Basin Plan states,

> "Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may defined for specific discharges upon the issuance of discharge permits or waiver thereof."

Turbidity generated as a result of driving trestle support piles is not expected to result in significant impacts to sensitive fish species or any other organisms for several reasons. Any turbidity generated is expected to be localized and not extend any significant distance away from where the work is being performed. It is likely sensitive fish species will avoid the work area due to sound and vibration and therefore would not come in contact with turbid water. Also, there is already significant background turbidity in the bay given the changing currents with tidal fluctuations. As noted during site visits, background turbidity varies throughout the bay depending on the tide, season, weather, as well as localized channel bottom contours. Any excess turbidity generated by the project is expected to dissipate quickly and would not likely extend past several tide cycles (i.e., 24 hours).

4. Wet concrete or cement contact with bay water will be minimized by coffer-dams and pouring concrete into the steel shells of the proposed footing piles. The proposed project will require an Individual National Pollutant Discharge Elimination System permit which will include safeguards to avoid or minimize toxic cement/concrete contact with bay marine life. The use of Best Management Practices for equipment operation and refueling on or over waters will minimize the possibility of accidental spills as well as minimize harm to marine life and birds if a spill does occur. These practices will include the use of secondary containment and non-toxic hydraulic fluids where practicable. Contingency planning to allow for expeditious containment and cleanup of inadvertent spills will also be required through contract specifications. In addition, the California Office of Spill Prevention and Response will regulate fueling over water.

5. There are two pairs, or a total of four proposed temporary access roads that are required to complete the seismic retrofit work. These access roads link the temporary trestle decks to land. The locations of these access roads are shown in Appendix C, Exhibits C-5 and C-7. The access roads would be located on the southeast side of Woodley Island and on the Samoa Peninsula. The areas of the proposed access roads have been surveyed for wetland and salt marsh vegetation as well as for threatened or endangered plants. There were no sensitive plants identified. The pair of access roads on the Samoa Peninsula would span a ditch where wetland plants are growing. See Chapter 3, Section 3.8 for more information.

Since paving access roads will increase storm water run-off at this location, this environmental document has been revised to state that geotextile fabric overlain with gravel will be placed on the temporary access roads. Temporary paving has been dropped as an option. After construction is completed, the geotextile fabric and gravel will be removed and the access roads will be restored to the initial grade and planted with non-persistent grass. In addition, rock slope protection may need to be placed on the access roads on Woodley Island to prevent bank erosion.

6. A hazardous waste/materials site investigation adequately identified potential contaminated material sources. The investigation included an evaluation of total metals concentrations in sediment samples at the bay locations to be excavated and drilled. Total metals were not detected above their respective Total Threshold Limit Concentration (TTLC) values or above ten times their respective Soluble Threshold Limit Concentration (STLC) values. A total of eight samples were collected from the Eureka Channel, six from the Middle Channel, and eleven from the Samoa Channel. The pH values ranged from 7.0 to 7.8. Additionally, no Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), pesticides, Poly-Chlorinated Biphenols (PCBs), or dioxins were detected in the sediment samples collected from all three channels. Given the either very low or non-detect concentrations for metals present in the channel sediments it is very unlikely the metals would dissolve into the water column out of a soil/sediment matrix.

   However, as a precaution, the construction contractor shall be directed to test excavated or drilled material from the bay. If any of this material is found through testing to contain concentrations above 1.0 mg/kg of either TPH-Motor Oil, TPH-Diesel, or TPH-Gasoline, or concentrations above 5.0 ug/kg of either Benzene, Toluene, Ethylbenzene, or Xylene, the material shall be disposed of at an appropriately permitted facility. The material shall become the property of the Contractor if testing shows contaminant concentrations below those mentioned above. The Contractor's sampling and testing analysis shall be performed using the sampling and testing analysis procedure required by the regulatory agencies in the locality of the job and any acceptance requirements put forth by a disposal facility. At a minimum, a sample shall be collected for every 25 cubic meters (32 cubic yards) of stockpiled soil. Samples shall be analyzed for Motor Oil (TPH-MO) by Test Method Modified EPA 8015 and Total Petroleum Hydrocarbons Diesel (TPH-D) and Gasoline (TPH-G) by Test Method Modified EPA 8015 and BTEX by EPA Method 8021. The laboratory used shall be certified by the California Department of Health Services for the required analyses.

   All excavated material found to be contaminated shall be stockpiled in a fenced area on two layers of 10-mil thick (minimum) black polyethylene. A perimeter berm for the stockpile shall be constructed by wrapping the edges of the plastic over hay bales, or equivalent, to prevent contaminated water runoff and infiltration. The stockpiles shall be covered with one layer of 10-mil (minimum) black polyethylene at all times. The plastic shall be sufficiently weighted with sandbags to prevent wind damage to the

plastic. Stockpiled petroleum impacted material shall be tested and disposed of within 30 days of completion of excavation work.

The construction contract will contain Special Provisions directing excavated soil material that is hazardous waste or designated waste shall be disposed of at an appropriately permitted facility. Removed wood piling and sheathing shall be disposed of at an appropriately permitted facility or may be salvaged.

7. Caltrans staff concur the channel bottom is important to benthic organisms as well as eelgrass. However, Caltrans met with resource agencies and determined that there are no threatened or endangered benthic organisms that would be substantially affected by the proposed project. The proposed work required to retrofit the bridge footings is not expected to substantially affect the bay bottom or the hydrodynamic conditions. (See Chapter 3, Sections 3.1 and 3.3 for more information.) At the shallow water, low clearance bridge piles, the excavated material will be stockpiled and then placed as backfill at the original location. At all channel bottom locations where work is proposed, the channel bottom is expected to eventually return to initial pre-work condition: the only exceptions would be where the above ground bridge footings are expanded and at the proposed eelgrass mitigation site. The overall project effects are expected to be minor, localized, and temporary. The channel bottom is primarily an U. S. Army Corps of Engineers (USACOE) Section 10 resource and all feasible measures to avoid, minimize, or mitigate negative effects will be implemented in compliance with an USACOE Section 10 permit.

8. The final environmental document has been revised to include a discussion of Section 30233 of the California Coastal Act in Chapter 3, Section 3.8 – Biological Resources. The proposed project is partly a maintenance project of existing structures with minimal excavation and filling.

9. Water quality objectives and beneficial uses for Humboldt Bay are set forth in the Water Quality Control Plan for the North Coast Region (i.e., Basin Plan). With regard to turbidity the Basin Plan states,

> "Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may defined for specific discharges upon the issuance of discharge permits or levels. Allowable zones of dilution within which higher percentages can be tolerated may defined for specific discharges upon the issuance of discharge permits or waiver thereof."

Adherence to this restriction is expected to substantially minimize any potential harm to marine organisms from increased turbidity. At all bridge footing work locations within the bay, the turbidity is not expected to substantially exceed ambient conditions because the proposed method of using cofferdams, barges, and temporary

trestles would avoid fill and unconfined excavation methods for construction. The only exception would be unconfined excavation around the shallow water Eureka Channel piers; however, turbidity would be confined by turbidity barriers as described in Caltrans response number three.

10. Caltrans staff acknowledges the importance of eelgrass, especially in the context of its overall decline along the West Coast. It is also acknowledged that there has been limited success of eelgrass mitigation projects; however there is a distinction between natural re-colonization and mitigation. Generally eelgrass grows wherever the conditions are suitable within the bay. This would indicate that eelgrass would likely re-colonize if after construction the original eelgrass growing conditions were restored as closely as possible to pre-construction conditions. Many eelgrass mitigation projects attempting to grow eelgrass at locations where eelgrass historically did not grow, on the other hand, do not succeed.

    Caltrans developed a plan in cooperation with resource agencies to mitigate for both temporary and permanent eelgrass impacts. The detailed plan will be completed and submitted during the resource agency permit process. Ultimately, the mitigation plan implementation will ensure that there would be no net loss of eelgrass habitat and consequently eelgrass impacts would not be substantial. For more information regarding mitigation for temporary and permanent eelgrass impacts, refer to Section 3.8 – Biological Resources in Chapter 3.

    There would be no other permanent net loss of aquatic vegetation, including eelgrass after mitigation is implemented.

11. Temporary trestles were determined to be the least environmentally harmful construction option. There were two other construction access at shallow water piers options considered and dropped: constructing gravel causeways and excavating for barges. Both of these options would have a greater area of disturbance than temporary piles. The trestle impacts on eelgrass from shading and displacement have been included in the eelgrass impact calculations. For information regarding mitigation for temporary and permanent eelgrass and mudflat impacts, refer to Section 3.8 – Biological Resources in Chapter 3.

12. The draft environmental document was incorrect in stating that the barges would be set on jacks. At the shallow water footings on the north segment of the Eureka Channel Bridge, the barges would rest directly on the channel bottom and would likely temporarily disturb eelgrass. (Note that at all other locations that require barge access, the barges would be used at deep-water channels and would not contact the channel bottom.) This area of temporary effect was calculated as part of the overall total of temporary eelgrass impact. The barges utilized at deepwater footings would not be raised on jacks or rest on the channel bottom.

13. The final environmental document has been revised to include a discussion of Sec-

tion 30233 of the California Coastal Act in Chapter 3, Section 3.8 – Biological Resources. It should be noted that the "fill" of the wetland for this project is temporary during the work at one of the Samoa Channel Bridge footings. (See Chapter 3, Section 3.8 – Biological Resources, for more information.)

14. The environmental document has been revised to include mudflat impacts in Chapter 3, Section 3.8 - Biological Resources section.

15. It is unlikely that temporarily closing the boat launch under the Eureka Channel Bridge would substantially affect boat access to the bay. Caltrans leases the airspace under the Eureka Channel Bridge to the City with the understanding that the boat launch can be closed for bridge maintenance work. Since four of the bridge footings that require retrofitting are within the boat launch complex, there are no alternatives to temporarily closing the boat launch. In addition, the boat launch needs to be closed to protect public safety during construction operations. The new boat launch facility on Waterfront Drive in Eureka would be available to the public as an alternative during the closure period. The City of Eureka built this new boat launch because the existing public boat launch was outmoded and too small to accommodate the existing demand. Caltrans helped the City of Eureka to secure state funding for the new boat launch. Finally, Caltrans mailed a public notice regarding the temporary closure of the boat launch to every Humboldt Bay commercial boat/fishing license holder as well as placing notices in the Times-Standard newspaper. To date, no one has objected or commented on the temporary boat launch closure. The City of Eureka, the owner and operator of this boat launch, has formally agreed to allow the temporary boat launch closure.

16. Additional discussion of underwater construction effects has been added to Chapter 3, Section 3.8.

17. Additional discussion regarding the importance of herring has been added to the final environmental document.

18. In Humboldt Bay tidewater gobies are most likely to be found in estuaries of streams such as Elk River, Eureka Slough, and Jacoby Creek or in the upper reaches of the bay adjacent to those streams. The artificial (constructed) channel under the Samoa Channel Bridge is not an estuary of a stream. Caltrans discussed the tidewater goby as part of the U. S. Endangered Species Section 7 coordination. The USFWS responded with a letter dated December 12, 2000 concluding the proposed project may affect, but is not likely to adversely affect the tidewater goby.

19. Caltrans is now proposing to plant native trees.

20. For most piers there will be excavation below the elevation of existing pier footings in order to place a concrete seal course to prevent water from surfacing through the bottom of the excavation. The seal courses will extend to the limits of the cofferdam

walls. Excavated material will either be transported by disposal lines or hauled away by trucks or double-handled and trucked from barges. Trucks could be loaded on the trestles or from docked barges. The locations of disposal lines will be approximately adjacent to the existing bridge within the bay then staked along the upper portion of roadway fill on Woodley and Indian Islands.

Handling of excavated substrate materials shall consist of separating water from sediment so that the solid material has acceptably low water content for upland disposal (for landfills, usually at least 50% solids by volume.) This de-watering shall be accomplished by usual means of settling and filtration using lined detention basins, containment tanks, filtration devices, or all three. De-watered sediments shall be tested and documented to meet all Acceptance Criteria of any selected disposal site(s). Separated water from these operations shall be discharged either back to Humboldt Bay or to the City of Eureka Wastewater Treatment Plant in compliance with all requirements of the North Coast Regional Water Quality Control Board.

The generation rate of excavated material and the size of any land-based or mobile de-watering systems will be dependent on how many crews are employed by the construction contractor. It is unlikely that more than 230 cubic meters (300 cubic yards) of material a day will be excavated. Total excavation is estimated at 12,000 cubic meters (16,000 cubic yards) for all three bridges.

21. Caltrans staff acknowledges that a substantial amount of fill material was placed on Indian Island during the 1972 construction of the bridges. However two culverts were placed across the roadway fill prism on Indian Island in order to help perpetuate the tide dynamics. Review of Caltrans maintenance records and discussion with Maintenance personnel indicates the drainage facilities within this section of highway have always been maintained and have functioned as designed. The tidal dynamics and vegetation context are complicated by other factors besides the Caltrans bridge and road construction and routine maintenance. For example, dikes were constructed on Indian Island to create livestock grazing land; portions of these dikes remain today and still have an influence tidal dynamics on the island. In addition ships were in Humboldt Bay long before Route 255 was constructed and inadvertently introduced the invasive non-native Chilean cord grass which now dominates Humboldt Bay salt marshes.

    Review of Caltrans maintenance records for hazardous spills, including oil, indicates that several recorded hazardous spills have occurred in this section of roadway. These spills were the result of vehicular highway accidents. The Caltrans hazardous waste/materials consultant procured sediment samples at project excavation and drilling locations. Elevated concentrations of oil derivatives or polychlorinated biphenyls (PCB) did not occur in the sediment sample analysis.

    Caltrans has an emergency response procedure in cooperation with California Highway Patrol to control and contain any hazardous materials discharge on State highway right of way from entering waters of the US. Hazardous material cleanup

contractors are on call to respond to hazardous spills to provide personnel, materials and equipment for containing and removing hazardous material and resulting contaminated soils and water.

In addition, the State Water Resources Control Board (SWRCB) issued a Statewide National Pollution Discharge Elimination System (NPDES) permit (Order No. 99-06-DWQ) to Caltrans on July 15, 1999. Subsequently Caltrans and the SWRCB developed a Statewide Storm Water Management Plan (SWMP) to establish a program to reduce the discharge of pollutants associated with the storm water drainage systems that serve state highways.

To satisfy this requirement, a Storm Water Pollution Prevention Plan (SWPPP) was prepared to address potential pollution from storm water runoff from construction and identify Best Management Practices (BMPs) to be considered for use on this project. Finally, Caltrans is funding four north coast research projects, which will study the impact of roadway runoff to surface waters and aquatic life. Results of these studies will help Caltrans develop mitigation measures, if necessary, to address pollutants from roadway runoff.

Other than in areas where traction sand is applied, an inlet sump does nothing to capture the normal pollutants of concern such as oil derivatives. If a sump is equipped with some sort of filtering media, then there is a concern regarding the reduction in interception capacity of the inlet. The constituent levels from Route 255 would not justify a BMP for this situation.

Exotic weedy vegetation removal outside of the Caltrans right-of-way would not be appropriate in-kind mitigation for the type of potential environmental effects that would result from the proposed seismic substructure retrofit of the Humboldt Bay Bridges. However Caltrans is in the process of directing landscape maintenance crews to modify vegetation control methods of clearing all vegetation from road to right-of-way fence to only cut back and remove non-native plant species and leave native species.

22. The Caltrans hydrodynamic consultant created a computer model of the entire Humboldt Bay to determine the potential project effects on the bay water and sediment dynamics. Qualitatively, the project is not expected to impact either bay water circulation or sediment movement. The predicted post-construction tidal velocities showed almost no effect on the existing channel depths and tidal velocities. The difference in velocities was within ±0.045 meters/second (±0.15 feet/second). The difference in depths was within ± 0.018 meters (±0.06 feet). (Source: Hydrodynamic, Sedimentation and Bridge Scour Analysis of Samoa Channel, Middle Channel and Eureka Channel Bridges Humboldt Bay, California prepared by WEST Consultants.)

23. Proposals to restore trees on Indian Island and re-introduce the Clapper Rail should be submitted to the California Department of Fish and Game and U. S. Fish and

Wildlife Service who have jurisdiction over the egret rookery and endangered species. These proposals would not be appropriate in-kind mitigation for the type of potential environmental effects that would result from the proposed seismic substructure retrofit of the Humboldt Bay Bridges.

24 The construction contract will include specifications to prohibit discarding debris in Humboldt Bay. The Caltrans resident engineers and construction inspectors will continuously monitor the construction contractor during construction activities for any contract violations.

25. The entire project is expected to be completed in three years or less. Caltrans staff will attempt to structure the work staging so that temporary trestles at Middle Channel Bridge would be in place for only one winter.

Environmental Document Mailing List

Copies of this final Environmental Assessment/Finding of No Significant Impact document will be submitted to the following organizations and individuals:

Federal Agencies:

U. S. Army Corps of Corps of Engineers
U. S. Coast Guard
U. S. Fish and Wildlife Service
U. S. Environmental Protection Agency
National Marine Fisheries Service

State Agencies:

California Department of Fish and Game - Region 3
California Coastal Commission

Local and Regional Public Agencies:

Regional Water Quality Control Board
Humboldt County Association of Governments
County of Humboldt Main Library
Humboldt Bay Harbor Recreation and Conservation District
North Coast Railroad Authority
Director of Community Development, City of Eureka
Director of Community Services, City of Eureka
Public Works Director, City of Eureka

Individuals and Organization Mailing List

Dr. Rudolf W. Becking
Table Bluff Reservation of Wiyot Indians
Northcoast Environmental Center
Ted Kuiper
Ken Bates

Notification of Environmental Document Availability Mailing List

The Honorable Mike Thompson, U. S. House of Representatives
The Honorable Virginia Strom-Martin, State Assembly
The Honorable Wesley Chesbro, State Senate
Bonnie Neeley, 4th District Humboldt County Supervisor
Nancy Flemming, Mayor, City of Eureka
Connie Stewart, Mayor, City of Arcata
U. S. Department of the Interior
California Department of Conservation
California State Lands Commission
California Coastal Conservancy
California Department of Boating and Waterways
California State Office of Historic Preservation
California Native American Heritage Commission
California Highway Patrol
North Coast Air Pollution Control District
County of Humboldt:
- Department of Public Works
- Division of Environmental Health, Public Health Department
- Fire Department
- Office of Emergency Services
- Transportation Department - Maintenance
- Sheriff Department
- Planning and Building Services Office of Emergency Services

Humboldt Transit Authority
Peninsula Union School District
Manila Community Services District
Eureka Transit Service
City of Eureka Manager
City of Eureka Fire Department
City of Eureka Police Department
Eureka Heritage Society
Redwood Region Audubon Society
Alternative Transportation & Recreational Association (ATRA) of Eureka

Louisiana-Pacific Company
Simpson Timber Company
Humboldt Coastal Coalition
Humboldt Surfriders Foundation
Humboldt County Historical Society
Humboldt Bay Maritime Museum
Redwood Community Action Agency
Humboldt Bay Rowing Association c/o Adorni Center
Samoa Cookhouse
Humboats
Coast Seafoods
Eureka Main Street Program
Citizens for Port Development
Humboldt Bar Pilots Association
Woodley Island Ship Shop
Blue Lake Rancheria
Bear River Band of Rohnerville Rancheria
California State Automobile Association
California Native Plant Society
Redwood Chapter Sierra Club
Eureka Chamber of Commerce
Fishermen's Marketing Association
Humboldt County Board of Realtors
Café Marina
National Weather Service, Eureka

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July 26, 2000

TITLE VI
POLICY STATEMENT

The California State 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, sex and national origin be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

Jeff Morales

JEFF MORALES
Director

Appendix D

Section 30233 of the California Coastal Act
(updated January 2001)
California Public Resources Code

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource-dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant dis-

ruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division. For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that not less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay, shall be designed and used for commercial fishing activities.

(d) Erosion control and flood control facilities constructed on watercourses can impede the movement of sediment and nutrients which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.