Chapter 4B. Environmental Setting for Point Arena to Sacramento

INTRODUCTION

This chapter provides an overview of the existing physical environmental conditions (i.e., the environmental baseline) at the time this analysis was prepared. The project proposed by Williams is to install, operate, and maintain a fiber optic cable system from Point Arena (Mendocino County) to the City of Sacramento. The project route follows primarily state and county road rights-of-way and railroad rights-of-way with a few miles crossing private lands. Four optical amplification (OP-AMP)/regenerator stations would be located on private land along the project route, including one in Yorkville, one in Windsor/Fulton, one in Schellville, and one in Elmira.

To provide diversity in the network so that service would not be interrupted in case of a cable break, this project route has been designed to have an additional diversity/redundancy route (i.e., another route with the same or similar initiation or termination point). The Point Arena to Robbins primary route (**Figure 1-1**), currently is being evaluated by a similar subsequent California Environmental Quality Act (CEQA) document.

The project involves a linear project route that traverses Mendocino, Sonoma, Napa, Solano, Yolo, and Sacramento Counties. The project route passes by or near the communities of Manchester, Point Arena, Yorkville, Cloverdale, Healdsburg, Windsor, Fulton, Santa Rosa, Cotati, Rohnert Park, Schellville, Cordelia, Fairfield/Suisun City, Davis, West Sacramento, and Sacramento. An initial study/mitigated negative declaration Ais neither intended nor required to include the level of detail included in an EIR@ (State CEQA Guidelines Sec. 15063), yet it must consider all phases of project planning, implementation, operation, and maintenance. To provide a useful description of the environment that may be affected by the component parts of this linear project, a general environmental setting is provided for each resource topic to be addressed.

This chapter is organized by resource topic, corresponding to the **Appendix F**, Environmental Checklist Form, of the State CEQA Guidelines, as amended. A completed checklist for the project is provided in **Appendix A**.

I. AESTHETICS

Aesthetics typically refers to the perceived visual character of an area, such as of a scenic view, open space, or architectural facade. The aesthetic value of a given area depends on a combination of viewer response and the visual character and scenic quality of the area. This combination may be affected by the components of a project (e.g., buildings constructed at a height that obstructs views, hillsides cut and graded, open space changed to an urban setting), as well as changing elements, such as light, weather, and the length and frequency of viewer exposure to the setting.

The visual setting of this project route would vary and traverse a variety of landscapes. The project route would pass through visual settings of rural coastal forest lands in Mendocino County; rural and urbanized inland valleys in Sonoma and Napa Counties; and grazing, agricultural, and marsh lands in Sonoma, Napa, Solano, and Yolo Counties. Although the project route would be largely rural, it would pass through urbanized areas in Cloverdale, Healdsburg, Santa Rosa, Cotati, Rohnert Park, Petaluma, Cordelia, Fairfield/Suisun City, Davis, and Sacramento. Generally, the project route would be parallel to railroad and county road rights-of-way or city

streets. The Yorkville, Schellville, and Elmira OP-AMP/regenerator stations would be constructed in largely undeveloped areas. The Windsor/Fulton OP-AMP/regenerator station would be constructed in an industrial area between the communities of Windsor and Fulton adjacent to U.S. Highway 101.

State Route (SR) 1 is a designated scenic highway within Mendocino County. The project route to Sacramento would parallel SR 1 for approximately 6 miles from the AT&T Corp. Japan cable landing at Manchester to Point Arena. The Schellville OP-AMP/regenerator station would be located near SR 121 in Sonoma County, and the Elmira OP-AMP/regenerator station located east of SR 113 near the Bynes Road/Hawkins Road intersection in Solano County, would be constructed near county designated scenic routes (Tigh pers. comm.). These scenic routes, however, are not designated California State Scenic Highways under the California Scenic Highway Program.

Regulations, Approvals, and Permits Applicable to Aesthetics

No state or federal aesthetics permits or regulations are applicable to the project. The project route would be located predominantly in railroad and state highway and county road rights-of-way, with a few short private land segments. OP-AMP/regenerator stations would not be constructed on state or federal lands.

At the local level, some jurisdictions would require approval of a conditional use permit before construction of OP-AMP/regenerator stations. Minimizing visual impacts would be one consideration in the granting of the permit application. In addition, any county and local jurisdiction maintaining policies to preserve and protect visual and scenic resources within its sphere of influence would be consulted during the design of OP-AMP/regenerator stations.

II. AGRICULTURAL RESOURCES

California is the nation=s leading agricultural state, with $26.8 billion worth of total production and income in 1997 (California Department of Food and Agriculture 1997). The variety of climates and soils in the state, together with the long growing season and availability of water, make California suitable for growing a wide variety of crops. The major crops produced in California include asparagus, cotton, citrus, grapes, lettuce, nuts, stone fruits (such as almonds and plums), strawberries, and tomatoes. Poultry, dairy, and beef cattle are also important products.

The loss of agricultural land is an increasingly important issue in California. The state=s growing population is resulting in the conversion of agricultural lands to suburban and urban uses. According to the 1994 to 1996 Farmland Conversion Report of the California Department of Conservation=s Farmland Monitoring and Mapping Project, approximately 15,400 acres (24 square miles) of prime farmland and farmland of statewide importance was converted to nonagricultural uses between 1994 and 1996 (California Department of Conservation 1998). As land is converted to other uses and agriculture enters into increasing competition with urban and natural resource users for water (increasing the cost of water and reducing its reliability), the agricultural economy of some parts of the state is being adversely affected.

The project route would cross agricultural lands in Mendocino, Sonoma, Napa, Solano, and Yolo Counties. All five counties produce a variety of crops, such as grapes, row crops, as well as livestock production.

The OP-AMP/regenerator sites at Yorkville, Windsor/Fulton, Schellville, and Elmira are not mapped by the Farmlands Mapping and Monitoring Project (FMMP). Because of insufficient soil information, substantial parts of California have not been mapped by the FMMP. Prime farmland has the best combination of physical and chemical features able to sustain long-term production of agricultural crops. Such land must have been used for the production of irrigated crops at some time during the two update cycles before the mapping date to be

classified as prime. The Yorkville OP-AMP/regenerator site in Mendocino County is designated as prime range land. It is a Type 2 Agricultural Preserve that is protected under the Williamson Act. The Windsor/Fulton site in the City of Windsor in Sonoma County is classified as urban and developed land (land in urban or residential uses). It is not in an agricultural preserve. The Schellville OP-AMP/regenerator site, also in Sonoma County, is not protected under the Williamson Act. The Elmira OP-AMP/regenerator site in Solano County is not considered prime farmland and is not within a Williamson Act preserve.

Regulations, Approvals, and Permits Applicable to Agricultural Resources

The California Farmland Protection Act (the Williamson Act) is the state=s primary method for conserving farmland. This voluntary program is administered at the county level and offers property tax incentives to farmers who promise to keep their land in agricultural use. Under the act, owners of farm and grazing lands may enter into a contract with their county limiting the use of their land to agriculture for a period of at least 10 years. In response, the county would assess the land at its productive value rather than its fair market value. This reduces property tax increases that would otherwise arise from speculation over land values.

The Williamson Act=s effectiveness in preserving farmland is limited by its voluntary nature. Those lands most likely to be developed are often not under contract or have had their contract canceled by the landowner in anticipation of development. The act is aimed at limiting the conversion of farmland to incompatible uses.

III. AIR QUALITY

Introduction

This chapter analyzes the air quality impacts that would result from construction and operation of Williams= Point Arena to Sacramento fiber optic cable system. The primary air emissions generated by this project would result from installation of the fiber optic cable, and construction and operation of the OP-AMP/regenerator stations.

Regulatory Setting

The regulatory setting describes the federal, state, and local air quality regulatory environment.

Federal Regulatory Environment. The Federal Clean Air Act (FCAA) was passed in 1963 by Congress and has been amended several times, most recently in 1990. The FCAA requires the U.S. Environmental Protection Agency (EPA) to establish national ambient air quality standards for air pollutants or air pollutant groups that pose a threat to human health or welfare. EPA has established National Ambient Air Quality Standards (NAAQs) for six criteria pollutants: ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead, particulate matter, and carbon monoxide (CO) (**Table 4B.III-1**). Two separate standards have been set for particulate matter 10 microns or less in diameter (PM10), and PM 2.5 microns or less in diameter (PM2.5).

Table 4B.III-1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	National	California	National	California	National
Ozone	O_3	8 hours	N/A	0.08	N/A	160	N/A	If 3-year average of annual third-highest daily 8-hour maximum exceeds standard
		1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years

Table 4B.III-1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	National	California	National	California	National
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	N/A	7,000	N/A	If exceeded	N/A
Nitrogen dioxide	NO_2	Annual average	N/A	0.053	N/A	100	N/A	If exceeded
		1 hour	0.25	N/A	470	N/A	If exceeded	N/A
Sulfur dioxide	SO_2	Annual average	N/A	0.03	N/A	80	N/A	If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	N/A	655	N/A	N/A	N/A
Hydrogen sulfide	H_2S	1 hour	0.03	N/A	42	N/A	If equaled or exceeded	N/A
Vinyl chloride	C_2H_3Cl	24 hours	0.010	N/A	26	N/A	If equaled or exceeded	N/A
Inhalable particulate matter	PM10	Annual geometric mean	N/A	N/A	30	N/A	If exceeded	N/A
		Annual arithmetic mean	N/A	N/A	N/A	50	N/A	If exceeded
		24 hours	N/A	N/A	50	150	N/A	If exceeded on more than 1 day per year
Fine particulate matter	PM2.5	Annual arithmetic mean	N/A	N/A	N/A	15	N/A	If spatial average exceeded on more than 3 days in 3 years
		24 hours	N/A	N/A	N/A	65	N/A	If exceeds 98th percentile of concentrations in a year
Sulfate particles	SO_4	24 hours	N/A	N/A	25	N/A	If equaled or exceeded	N/A
Lead particles	Pb	Calendar quarter	N/A	N/A	N/A	1.5	N/A	If exceeded no more than 1 day per year
		30 days	N/A	N/A	1.5	N/A	If equaled or exceeded	N/A

Notes: All standards are based on measurements at 25EC and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
N/A = not applicable.

Air basins that have not violated an ambient air quality standard are considered to be in attainment for that standard. Conversely, air basins with recorded violations of an ambient air quality standard are classified as nonattainment areas for that pollutant. Most air basins are classified as nonattainment areas for one or more pollutants and attainment areas for other pollutants. Also, for certain pollutants, such as PM10, California has a more stringent standard than the federal standard. Consequently, an air basin may be classified as a nonattainment area for the state PM10 standard while it is in attainment for the federal PM10 standard.

Air basins classified as nonattainment areas for the NAAQs must prepare state implementation plans that describe the specific steps that would be taken to bring the nonattainment area into compliance. Those steps primarily include rules and regulations to limit air emissions from specific stationary and mobile sources. The FCAA contains specific dates by which the NAAQs must be met, otherwise federal sanctions can be imposed.

California Regulatory Environment. The California Clean Air Act (CCAA) of 1988 differs from the FCAA in that there are no sanctions nor specific deadlines for attainment of the California Ambient Air Quality Standards (CAAQs), also shown in **Table 4B.III-1**. The CAAQs were enacted in response to the need for new air quality requirements. Under this act, air quality attainment is required at the earliest practicable date, and reasonable progress must be made each year until attainment is achieved.

Similar to the FCAA, the CCAA requires attainment plans for designated nonattainment areas. The California Air Resources Board (ARB) is responsible for preparing the plans for meeting the NAAQs and CAAQs. The ARB has delegated to the California air districts the responsibility for preparing air quality attainment plans. Unlike the FCAA, the CCAA does not require an air quality attainment plan for areas designated as nonattainment for PM10.

Local Air Quality Regulatory Environment. The ARB has delegated much of its air pollution control authority to local air pollution control districts and air quality management districts. California=s 15 air basins are listed in **Figure 4B.III-1**. The project would cross the three air basins and five air districts shown in **Table 4B.III-2**.

For air basins that do not meet the CAAQs or NAAQs shown in **Table 4B.III-1**, individual air districts or groups of air districts prepare air quality management plans designed to bring an air basin into compliance with nonattainment area pollutants. Those plans are submitted to the ARB for approval, usually containing an emission inventory and a list of rules proposed for adoption.

Table 4B.III-2. California Air Basins and Local Air Districts Crossed by the Fiber Optic Cable System

Air Basin	Local Air Districts	Nonattainment Status
North Coast	Mendocino County, Northern Sonoma	PM10 (state standards)
San Francisco Bay Area	Bay Area	Ozone (state and federal standards) PM10 (state standards)
Sacramento Valley	Yolo-Solano, Sacramento	PM10 (state standards) Ozone (state and federal standards)

Source: California Air Resources Board 1999.

Environmental Setting

The environmental setting section includes the attainment/nonattainment status for the three California air basins that would be crossed by this project, with regard to the pollutants of most concern from construction and operation. The discussion also explains the effects of California=s climate and meteorology on air quality.

Pollutants of Concern and Attainment/Nonattainment Status

Table 4B.III-2 shows the attainment versus nonattainment status for the three California air basins with regard to the pollutants of most concern from construction and operation of the project. Those pollutants include ozone, respirable particulates, carbon monoxide, and nitrogen oxides. These pollutants, each of which is described below, are emitted as construction equipment exhaust, fugitive dust, and diesel exhaust from emergency backup generators.

Ozone Ozone is a respiratory irritant and oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant; attacks synthetic rubber, textiles, plants, and other materials; and causes extensive damage to plants by leaf discoloration and cell damage.

Ozone is not emitted directly into the air, but instead is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen (NOx), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. ROG and NOx are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period. The EPA recently replaced the 1-hour ozone standard with an 8-hour standard of 0.08 ppm. However, areas classified as nonattainment for ozone must attain the 1-hour ozone standard. After an area has achieved attainment of the 1-hour standard, then the 1-hour standard is no longer applicable, and the area must strive to meet the 8-hour ozone standard.

The San Francisco and Sacramento Valley Air Basins, which would be crossed by the project route, are nonattainment for both the state and federal ozone standards. The North Coast Air Basin is classified as attainment for the state ozone standards.

PM10 and PM2.5 Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates can damage human health and retard plant growth. Particulates also reduce visibility, soil buildings and other materials, and corrode materials.

PM10 emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

The federal ambient air quality standard for particulate matter currently applies to PM10 and PM2.5. The CAAQs only applies to PM10.

The state PM10 standards are 50 micrograms per cubic meter as a 24-hour average and 30 micrograms per cubic meter as an annual geometric mean. The federal PM10 standards are 150 micrograms per cubic meter as a 24-hour average and 50 micrograms per cubic meter as an annual arithmetic mean. The federal PM2.5 standards equal 15 micrograms per cubic meter for the annual average and 65 micrograms per cubic meter for the 24-hour average.

All of the air basins that would be crossed by the project route are attainment for the federal PM10 standards. However, all except the North Coast Air Basin, are nonattainment for the more stringent state PM10 standards (**Table 4B.III-2**).

Carbon Monoxide. CO is essentially inert to plants and materials, but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans can range from slight headaches to nausea to death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light wind combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. Monitored CO

concentrations have been improving because of the use of oxygenated fuels in California. Violations of the CO concentrations are generally only a problem in heavily urbanized areas.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period.

Of the air basins through which the project route would pass, all are currently attainment for federal CO standards.

Nitrogen Oxides. NOx contribute to smog, can injure plants and animals, and can affect human health. Also, NOx contributes to acidic deposition and reacts with reactive organic gases in the presence of sunlight to form photochemical smog. NOx concentrations result in a brownish color because NOx absorbs in the blue-green area of the visible spectrum, greatly affecting visibility.

NOx is primarily emitted by combustion sources, including both mobile and stationary sources. NOx is also emitted by a variety of area sources ranging from wild and prescribed fires to water and space heating systems powered by fossil fuels.

The state NOx standard equals 0.25 ppm on a 1-hour average. The federal NOx standard equals 0.053 ppm on an annual average. All areas through which the project route would pass are attainment areas for the state and federal NOx standards.

California Climate and Meteorology

The project route would cross three air basins within California: the North Coast Air Basin (Mendocino and portions of Sonoma County), the San Francisco Bay Area Air Basin (portion of Sonoma County, Napa County, and portions of Solano County), and the Sacramento Valley Air Basin (portion of Solano County, Yolo County, and Sacramento County).

Those portions of the North Coast Air Basin crossed by the project route generally have good air quality because of the prevalence of sea breezes and lack of substantial emission sources. Sea-land breezes can remove smog and associated pollutants from coastal areas during the day as cold dense air moves onshore but may push that pollution back during the night as the land breeze gently flows offshore. The project route also crosses through the San Francisco Bay Area Air Basin. This area is characterized by fairly good air quality except for elevated levels of ozone during summer months when high temperatures and low winds lead to the buildup of pollutants in interior valleys.

The Sacramento Valley Air Basin is located in the interior of California within California=s Central Valley. The project route would cross the southern end of the Sacramento Valley, which is bound by the Coast and Diablo Ranges on the west and the Sierra Nevada range on the east. The prevailing winds are from the south, primarily because of marine breezes through the Carquinez Strait, although during winter the sea breezes diminish and winds from the north occur more frequently. Elevated ozone concentrations are often found in the Sacramento Valley Air Basin during summer months because of high temperatures, sunlight, and high levels of motor vehicle emissions.

IV. BIOLOGICAL RESOURCES

This section provides information on biological resources that are known or would have the potential to occur along the project route. For the purpose of this subsequent IS/MND, biological resources includes plant, wildlife,

fisheries resources, and wetlands. Common and scientific names of the plant, wildlife, and fish species are provided in **Appendix K**.

Methods

Botanical and Wetland Resources

For the purpose of this subsequent IS/MND, the botanical resources study area varied depending on terrain constraints, private property boundaries, fence lines, and dense vegetation that would not be removed during construction. The project study area along the project route consisted of a 100-foot-wide corridor in open areas that were not confined by these factors. The project study area for the four proposed OP-AMP/regenerator stations consisted of a 500- by 500-foot area. The project study area in general ranged from 3 to 100 feet in width, depending on the factors listed above.

Botanical and wetland surveys were conducted in August, September, and December 1999. The general purpose of the field surveys was to:

- characterize plant communities and unique plant assemblages,
- locate late-blooming special-status plant species and identify suitable habitat for early-blooming special-status plants,
- delineate waters of the United States (including wetlands) using the U.S. Army Corps of Engineers' (Corps') 1987 Wetland Delineation Manual (Environmental Laboratory 1987),
- map noxious weed infestations (see the definition below for species considered noxious weeds in this analysis),
- gather information to assist project engineers with project route design through identification of sensitive vegetation and wetland resource constraints and avoidance opportunities, and
- coordinate with state and federal resource agencies to develop measures that avoid or minimize impacts on vegetation and wetland resources.

Plant Communities. Descriptions and names of plant communities are based on Jones & Stokes' field surveys and on descriptions found in Holland (1986) and Sawyer and Keeler-Wolf (1995). Although the system of Sawyer and Keeler-Wolf represents the most recent treatment and includes greater community detail than the system of Holland, it is incomplete for many geographical areas in California. Additionally, some of the plant communities described in this subsequent IS/MND do not fit well into the communities circumscribed by either Sawyer and Keeler-Wolf or Holland. Therefore, some community type names have been developed based on Jones & Stokes' field observations.

The general location and extent of plant communities were mapped during field survey on USGS 7.5-minute topographic maps, which remain on-file at Jones & Stokes.

Noxious Weeds. Noxious weed infestation and dispersal on private and public lands have been identified by the federal government and local counties as issues of concern. Two federal acts and one executive order direct weed control: the Carlson-Foley Act of 1968, Federal Noxious Weed Act of 1974, and a federal executive order on invasive species (February 3, 1999). To identify noxious weed species of concern along the project route, the following sources were consulted:

- a list of species designated as federal noxious weeds by the U.S. Department of Agriculture;
- county agricultural commissions;
- California Department of Food and Agriculture=s AA@, AB@, and AC@ lists of noxious weeds; and
- California Exotic Pest Plant Council list of pest plants of ecological concern.

For this analysis and field surveys, a noxious weed is a plant that has the potential to displace native plants and natural habitats, affect the quality of forage on rangelands, or affect cropland productivity. High-priority noxious weeds include all California Department of Food and Agriculture=s A-rated species. Some B- and C-rated species were included in this analysis if they were identified by county agricultural commissions as target noxious weeds. Additional weeds were included if they were considered to have great potential for displacing native plants and damaging natural habitats and are not considered too widespread to be effectively controlled (**Appendix H**). Noxious weed infestations were documented by mapping polygons of noxious weeds and assigning a level of infestation. These levels include the following:

- Level 1 Infestation: less than 1% absolute cover,
- Level 2 Infestation: 2% to 10% absolute cover,
- Level 3 Infestation: 11% to 50% absolute cover, and
- Level 4 infestation: 51% to 100% absolute cover.

Noxious weed locations, infestation levels, and proposed wash stations are currently being identified and would be provided to the appropriate land management and resource agencies (including the California Public Utilities Commission [CPUC]) prior to construction.

Waters of the United States (Including Wetlands) For this document, the term waters of the United States is an encompassing term used by the Corps for areas that would qualify for federal regulation under Section 404 of the Clean Water Act. Waters of the United States are separated into wetlands and other waters of the United States.

Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 Code of Federal Regulations [CFR] 328.3[b], 40 CFR 230.3). For a wetland to qualify as jurisdictional by the Corps, and therefore be subject to regulation under Section 404 of the Clean Water Act, the site must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology. Wetlands were delineated using the methods outlined in the Corps 1987 Wetlands Delineation Manual. Wetlands identified along the project route would include emergent wetland, salt marsh, and seasonal wetland.

Other waters of the United States are sites that typically lack one or more of the three indicators identified above. Other waters of the United States identified in the project study area include drainages, irrigation canals that connect to natural waterways, and stock ponds. For this document, drainages include all surface features with defined beds and banks.

Lists of waters of the United States delineated for the project route are provided in **Appendix G**. A brief description of these waters of the United States and methods used to delineate them are provided in the wetland delineation reports (**Appendix D**).

Special-Status Plant Species. For the purpose of this subsequent IS/MND, the term special-status plants is defined as species that are:

- listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (federal Endangered Species Act [ESA]) (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species);

- candidates for possible future listing as threatened or endangered under the federal ESA (58 FR 188: 51144-51190, September 30, 1993);

- federal species of concern (former C2 candidates);

- listed by the State of California as threatened or endangered under the California ESA (14 CCR 670.5);

- plants listed as rare and endangered under the California Native Plant Protection Act of 1977 (California Fish and Game Code, Section 1900 et seq);

- plants considered by California Native Plant Society (CNPS) to be Arare, threatened, or endangered in California@ (List 1B); and

- CNPS Lists 2, 3, and 4 species that warrant consideration as special-status plants, such as species that are unique occurrences, range extensions, or locally uncommon.

Existing available information was reviewed to develop a list of special-status plants that could exist in the project study area. This information included DFG=s Natural Diversity Data Base (NDDB) (1999), CNPS=s Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1994), previously prepared environmental documents, Jones & Stokes= file information, and a list of species provided by the U.S. Fish and Wildlife Service (USFWS) (**Appendix L**). Additional information on species= habitat requirements, blooming periods, and field identifying characteristics was obtained from floras (Munz and Keck 1973, Hickman 1993).

Surveys for late-blooming plants and habitat assessments were conducted in August, September, and December 1999. Surveys were conducted by driving the project routes (where possible) and surveying on foot those areas that could provide habitat for special-status plants with the potential to occur in the region. In general, floristic survey guidelines described by Nelson (1987) were used to locate late-blooming special-status plants. Additional floristic surveys would be conducted between March and May/June 2000 to locate early blooming special-status plants. Overall, the project route was determined to have a low potential to support special-status plants within road and railroad rights-of-way.

During 1999 surveys, all species were identified to the level necessary to determine whether they would qualify as special-status plants. Floristic survey field forms were completed by the botanical teams and were used to document species encountered during the field surveys. The special-status plant population located during the field surveys was documented on a CNPS field survey form, photographed, flagged, and mapped on the U.S. Geological Survey (USGS) 7.5-minute quadrangle. These special-status plant species would also be located on the construction drawings for the project route.

A special-status plant survey and habitat assessment was conducted at each of the OP-AMP/regenerator stations. No special-status plant species were found; however, the OP-AMP/regenerator sites would be included in the spring surveys mentioned previously.

Wildlife Resources

The goal of the wildlife resource studies conducted for the project was to obtain sufficient information to assess the potential impacts of the project on wildlife resources along the route. To accomplish this goal, the following tasks were conducted:

- obtain and review existing information on wildlife resources known to be present in the project study area;
- conduct habitat-based field surveys (described below) to describe and evaluate habitat types and species associations along the project route;
- if necessary, conduct species-specific field surveys (described below) for special-status wildlife species;
- gather information to assist project engineers with project route design through identification of sensitive wildlife resource constraints and avoidance opportunities; and
- coordinate with state and federal resource agencies to develop measures that avoid or minimize impacts on wildlife resources.

Prefield Survey Investigation. Before field surveys were conducted, existing and available information was gathered and reviewed to determine the location and types of wildlife resources that could exist in the project study area. Information on species occurrences was gathered from statewide databases through contacts with the Natural Heritage Division and Nongame and Endangered Wildlife Section of DFG. Contacts were also made with resource specialists from the, DFG, and USFWS to gather file information on wildlife resources in the project study area (**Appendix L**). Contacts were made by telephone, through correspondence, and through office visits. Resource management plans and other environmental documents prepared for other projects in the project study area were also reviewed.

All existing resource information was mapped onto USGS 7.5-minute quadrangles. Lists of all special-status wildlife species with the potential to occur in the project study area, along with their legal status, distribution, and habitat association, are provided in **Appendix K-4**.

Habitat-Based Field Surveys. Qualified wildlife biologists conducted habitat-based field surveys throughout the project study area. Surveyors visited the project study area and mapped habitat types within and adjacent to the project route. Generally, habitats were mapped and evaluated within a 0.5-mile-wide corridor. The objectives of these surveys were to:

- complete a detailed habitat-based resource survey of the entire project route and surrounding area to characterize habitat type, quality, and species associations, and
- evaluate habitat for threatened, endangered, candidate, and other special-status wildlife species that were identified as having the potential to occur in the proposed project study area.

Species-Specific Field Surveys. Based on the results of the prefield survey investigation and habitat-based surveys, species-specific surveys were, or will be, conducted and will coincide with the appropriate survey period for each species. These surveys would include the following components:

- surveys to identify and map habitat for specific listed species and other special-status species, and

- surveys to determine presence or absence (where possible) of specific special-status wildlife species.

Species-specific habitat mapping has been conducted for several species. Several approaches may be used to detect species and avoid or minimize impacts during construction. Species-specific surveys would be conducted using resource agency protocols where needed to determine presence or absence of certain species, followed by establishment of no-disturbance buffer zones in active areas. In some cases, particularly where survey protocols are costly to implement, Williams may simply assume the presence of the species and implement construction mitigation measures and habitat compensation. Where special-status species are assumed or confirmed as occurring in the project study area, standardized survey methods, as required by the applicable state or federal agency, may also be used before construction to ensure the absence of special-status species within the construction work area.

Special-Status Wildlife Species. In this subsequent IS/MND, the term special-status wildlife includes species that are:

- listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.11 [listed animals] and various notices in the Federal Register for proposed species);

- candidates for possible future listing as threatened or endangered under the federal ESA (58 FR 188: 51144-51190, September 30, 1993);

- federal species of concern (former C2 candidates);

- listed by the State of California as threatened or endangered under the California ESA (14 CCR 670.5);

- animal species of special concern to the California Department of Fish and Game (DFG) (Remsen 1978 [birds] and Williams 1986 [mammals]); and

- animal species fully protected in California (Cal. Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians].

Discussions of various special-status wildlife species are presented later in this section under "Threatened, Endangered, Candidate, and Other Special-Status Species". There are a total of 17 state- or federally listed wildlife species and 47 nonlisted special-status wildlife species that could exist in the proposed project study area (**Appendix K-4**).

Fisheries Resources

Information on fish and fish habitats in, and downstream of, the project study area was obtained from personal communications with regulatory agency staff, NDDB (1999), published literature, and previously prepared environmental documents. Personal communications used for this assessment included information from USFWS and National Marine Fisheries Service (**Appendix L**), and communications with DFG (Hine, Marshal, McGwire, Roper, and Taveres pers. comms.). Literature reviewed is listed in Chapter 6, "Citations", under Moyle 1976, Leidy 1984, Sigler and Sigler 1987, Swift et al. 1989, Swift et al. 1993, Moyle et al. 1995, Busby et al. 1996, Jones & Stokes Associates 1995 and 1998, and Titus et. al in press. For this CEQA analysis, information is provided for named mapped drainages found on USGS 7.5-minute quadrangles. All drainages (waters of the United States) were inventoried during field surveys as part of the permitting processes for the project route. Each drainage was then evaluated to determine the potential presence of special-status fish species. Streams that were determined to potentially support special-status fish were considered occupied for purposes of this subsequent IS/MND.

Special-Status Fish Species. For this subsequent IS/MND, the term special-status fish includes species that are:

- listed or proposed for listing as threatened or endangered under the federal ESA (various notices in the Federal Register for proposed species);
- candidates for possible future listing as threatened or endangered under the federal ESA (58 FR 188: 51144-51190, September 30, 1993);
- federal species of concern (former C2 candidates);
- listed by the State of California as threatened or endangered under the California ESA (14 CCR 670.5); and
- California state species of concern.

A total of 21 special-status fish species could exist in drainages crossed by the project route, including eight state- or federally listed fish species and 13 nonlisted special-status fish species. Special-status fish species potentially associated with the project route are discussed in more detail later in this section. Lists of all special-status fish species with potential to occur in the project study area, along with their legal status, distribution, and habitat association, are provided in **Appendix K-5**.

Setting

Plant Communities and Associated Wildlife Habitats

Agricultural Lands. Agricultural lands are found in the Central Valley and Delta portions of the project study area; however, some coastal valleys also are either under cultivation or are grazed by cattle. Vineyard and rangelands are the primarily agricultural lands located along the route. Depending on the crop pattern and the proximity to native habitats, agricultural lands can provide relatively high-value habitat for wildlife, particularly as foraging habitat. Raptor species use agricultural land for foraging because rodents often congregate in these fields. Agricultural habitats also provide foraging and resting habitat for migrating and wintering waterfowl and shorebirds.

Annual Grassland. Annual grassland is a herbaceous community found throughout the project study area. Grasslands are found on ridges, hill slopes, and valley floors. Typical plant species include a mix of dominant non-native grasses, such as soft chess, red brome, ripgut brome, foxtail barley, wild oats, and annual fescues, intermixed with forb species, such as clovers, lupines, owl's clover, popcorn flower, poppies, and various species of filaree. Some areas have been subject to frequent disturbance, such as grazing and maintenance activities along roadsides. The annual grassland vegetation in these areas may be dominated by ruderal introduced weedy species, such as yellow star-thistle, tocalote, and Mediterranean mustard.

Species diversity in grasslands is typically high. Grasslands are important because they support insects, amphibians, reptiles, and small birds and mammals that are preyed on by other wildlife, including red-tailed hawks, northern harriers, American kestrels, burrowing owls, coyotes, and gray foxes. Grasslands near open water and woodland habitats are used by the greatest number of wildlife species because they provide places for resting, breeding, and escape cover.

Coast Live Oak Woodland. Coast live oak woodland is found primarily in the inner Coast Ranges along the project route. Mixed coast live oak woodland is dominated by a varying mixture of California bay and coast live oak. Associated shrub and subshrub species include toyon, manzanita, coffeeberry, California buckeye, redbud, coyote bush, and poison oak.

Herbaceous species are mostly lacking in woodlands that contain a well-developed shrub layer. In open areas, herbaceous species include many that are common to the adjacent blue oak woodland/grass and annual grassland plant community.

Coast live oak woodland provides important breeding, foraging, and cover habitat for most of the wildlife species common to the inner Coast Ranges. The upper canopy provides nesting, foraging, and cache sites for many birds, such as Lewis=s woodpecker, acorn woodpecker, northern flicker, oak titmouse, western bluebird, mourning dove, and red-tailed hawk, and the understory shrub layer provides habitat for many common bird species, such as golden and white-crowned sparrows, and small mammals, such as the dusky-footed woodrat.

Upland Redwood Forest. Upland redwood forest generally exists on the shallow, well-drained soils of steep slopes. It is similar to north coast alluvial redwood forest but is not as tall and includes a greater diversity of tree species and a more shrubby understory (Holland 1986). Upland redwood forest is the prevalent community in the project study area within approximately 30 miles of the coast. It is characterized by coast redwood in the upper canopy, with Douglas fir usually dispersed throughout this layer, and a secondary tree layer consisting of tanoak, Pacific madrone, and interior live oak. The canopy cover of the shrub layer is usually moderate to dense, consisting of California huckleberry, salal, and rose bay. Associated understory plants include deer fern, bracken fern, sword fern, redwood violet, and modesty. Saprophytes, such as phantom orchid and striped candyflower, are found sporadically on the forest floor. Red alder is also found in this community, typically as a narrow band along watercourses.

Relative to alluvial redwood forests, upland redwood forests support a greater diversity of wildlife species. These stands tend to support a more complex vegetative structure, with one or more codominant upper canopy species, such as Douglas-fir, grand fir, Sitka spruce, or western hemlock; a midstory layer; and a shrub understory. Bird species found in these forests include Hutton=s vireo, bushtit, hermit warbler, Bewick=s wren, American robin, and dark-eyed junco. Northern goshawk, northern spotted owl, and Cooper=s hawk are also known to nest in these stands. Several amphibians, including northern red-legged frog and foothill yellow-legged frog, are found in streams and adjacent uplands in redwood forests, and mammals, such as Pacific shrew, Townsend=s chipmunk, and gray squirrel, are common. Specific habitat elements in redwood forests are particularly important for some species. For example, snags are essential for species such as Vaux=s swift, purple martin, white-breasted nuthatch, and arboreal and clouded salamanders. Downed wood is an important habitat element for California slender salamander, Douglas= squirrel, gray fox, and Pacific fisher.

Mixed Hardwood Forest. Mixed hardwood forest consists primarily of Douglas fir trees. This community exists occasionally on relatively drier south-facing slopes at more inland sites. Tanoak and madrone typically are found in the secondary layer.

Wildlife in mixed hardwood includes ash throated flycatcher, olive-sided flycatcher, Pacific-slope flycatcher, northern flicker, red-breasted nuthatch, winter wren, and a variety of other birds are found in this forest. Small mammals, such as dusky-footed woodrat and deer mouse, and larger mammals, such as black bear and black-tailed deer, also exist.

Valley Riparian Forest. Valley riparian forest is an uncommon plant community regionally and statewide because of historic and continuing habitat loss. It is an essential community to many special-status wildlife species. Valley riparian forest is a dense, broadleafed, winter deciduous forest dominated by one or more large

trees, such as Fremont cottonwood, valley oak, and western sycamore. Riparian forest generally exists in the upper floodplains, outside of the area annually scoured by the active stream channel. The canopy is generally closed and composed of several layers. Other common tree species include box-elder, northern California black walnut, Oregon ash, red willow, and Goodding=s willow. Understory shrubs include buttonbush, California rose, and poison oak. California grape is also an important component of denser, less-disturbed riparian forest.

Despite widespread disturbances from urbanization, agricultural conversion, and grazing, riparian forest remains an important wildlife resource because of its scarcity regionally and statewide and because the riparian community is used by a large variety of wildlife species. This habitat produces abundant aquatic and terrestrial invertebrates that are prey for amphibians and reptiles, such as common garter snakes, western skinks, and ringneck snakes, as well as insectivorous birds, such as warblers, northern flickers, downy woodpeckers, and flycatchers. Small mammals found in riparian habitats include shrews, voles, bats, and mice. Raptors that nest in large riparian trees include great-horned owls, red-tailed hawks, and American kestrels. Cavity-dependant species, such as woodpeckers, bats, squirrels, and raccoons, require mature stands of trees. Striped skunks, red foxes, gray foxes, and badgers forage in riparian habitats and use them for cover and travel.

Valley Oak Woodland. Valley oak woodland exists primarily in small remnant patches on the floor of the Central Valley and in valleys of the inner Coast Range. Valley oak woodland consists of open woodland dominated by valley oak. The understory consists of grasses and forbs typical of annual grassland, such as ripgut brome and common fiddleneck, and includes shade-tolerant non-native forbs, such as oriental mustard, dwarf nettle, and milk thistle. Valley oak woodland is a sensitive plant community because it has become uncommon because of conversion to agriculture and because regeneration is inhibited by heavy grazing and competition from non-native species.

These woodlands are especially important to wildlife because they provide valuable forage, cover, and nesting habitat for many ground, shrub, and tree-nesting species. Woodpeckers excavate nest holes in live and dead oaks, and these cavities are subsequently used by other species, such as American kestrels, western screech owls, tree swallows, ash-throated flycatchers, white-breasted nuthatches, oak titmice, and western bluebirds. Oak acorns provide an important food source for many species, including band-tailed pigeons, acorn woodpeckers, scrub jays, western gray squirrels, and black-tailed deer.

Oak foliage and bark attract insects that are important to the diet of birds, such as white-breasted nuthatches, oak titmice, Bewick=s wrens, ruby-crowned kinglets, American robins, Cassin=s vireos, Hutton=s vireos, orange-crowned warblers, black-headed grosbeaks, Bullock=s orioles, and house finches.

The grasslands understories of valley oak woodlands offer foraging habitat and cover for Pacific treefrogs, western fence lizards, California quails, northern flickers, black-tailed hares, deer mice, gray foxes, and black-tailed deer.

Emergent Wetland. Emergent wetland habitat was delineated as jurisdictional wetlands along the project route **(Appendix G).** This habitat would be considered a jurisdictional wetland by the Corps based on the prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology.

The emergent wetlands occur along the project route wherever year round, shallow, standing water is present. It is associated with groundwater seeps and also occurs along the edges of canals, irrigation ditches, sloughs, stock ponds, perennial drainages, and riverbanks. Emergent wetland is dominated by perennial emergent species, including cattail, tule, sedge, water smartweed, duckweed, and annual rabbit=s-foot grass.

The narrow band of emergent marsh vegetation along canals, ditches, and other drainages provides nesting and foraging opportunities for water bird species and small mammals, including mallards, green-winged teals,

great blue herons, great egrets, marsh wrens, song sparrows, red-winged blackbirds, raccoons, and California voles.

Emergent marsh is a sensitive community because of historic and continuing loss of wetland habitats from agricultural conversion, urbanization, and flood control development.

Seasonal Wetland. Seasonal wetland habitat was delineated as jurisdictional wetlands along the project route (**Appendix G**). This habitat would be considered a jurisdictional wetland by the Corps based on the prevelance of hydrophytic vegetation, hydric soils, and wetland hydrology.

Seasonal wetlands along the project route include areas that pond water during and after rainstorms and support hydrophytic vegetation. These seasonal features are both natural and artificially-created and occur in roadside ditches, seasonal drainages, and stock ponds. Seasonal wetlands potentially exist along all portions of the project route. Seasonal wetland vegetation varies along the route but generally consist of hyrophytic grasses and forbs including rush, sedge, carex, monkey-flower, mint, Italian wildrye, and Mediterranean barley. These sites provide habitat for waterbirds and amphibians, and provide a source of water for many animals.

Salt Marsh. Salt marsh habitat was delineated along the project route (**Appendix G**). Salt marshes occur west of Elmira in areas of brackish water. Salt marsh along the project route are dominated by pickleweed, salt grass, frankenia, and other herbaceous hydrophytes. Salt marshes are considered jurisdictional wetlands.

Drainages. Perennial drainages and seasonal drainages (includes irrigation canals) were delineated along the project route (**Appendix G**). For the purpose of this subsequent IS/MND, drainages includes all natural waterways that are characterized by a bed and bank and sustain flowing water at some time of the year (e.g., streams, creeks, rivers, and irrigation canals that are connected or divert water from natural waterways). Drainages that lack jurisdictional wetland communities would be considered other waters of the United States by the Corps.

Description of Fisheries Resources.

The Russian River supports central California coast ESU steelhead, southern Oregon-California coast ESU chinook salmon, central California coast ESU coho salmon, American shad, striped bass, rainbow trout, Russian River tule perch, hardhead, and Navarro roach. The Garcia River and tributaries also support steelhead and coho salmon.

The Sacramento River and the connected tributary streams and sloughs support a number of fish species, including all four runs of Central Valley chinook salmon (fall-/late fall-run, spring-run, and Sacramento River winter run ESUs); Central Valley ESU steelhead; delta and longfin smelt; Sacramento splittail; green and white sturgeon; Pacific and river lampreys; and various trouts, shad, squawfish, sculpins, suckers, perches, bass, and roach.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 127 special-status plants have the potential to occur in the vicinity of the project route (**Appendix K-3**). Of these, 27 species are federally listed as threatened or endangered, 25 are state-listed as threatened or endangered and 95 are nonlisted special-status plants.

During the 1999 field surveys, no special-status species were located. Additional floristic surveys would be conducted in 2000 to confirm the absence of special-status plants.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 64 special-status wildlife species were initially identified as having potential to occur in the project study area (**Appendix K-4**). Of these, 17 state- or federally listed wildlife species and 47 nonlisted special-status wildlife species. The following special-status wildlife species or habitat for these species were located along the project route:

- Point Arena Mountain Beaver. Habitat for the Point Arena Mountain Beaver exists along the Garcia River which is crossed by the project route. Potential impacts to this species are discussed and mitigated to a less than significant level in the CPUC/CEQA approved ISMND dated October 21, 1999.

- Swainson=s hawk. Several active nests were located on or near the project route in the Central Valley portion of the proposed project study area.

- Valley elderberry longhorn beetle. Numerous elderberry shrubs, the host plant for Valley elderberry longhorn beetle, were located along the project route in the Central Valley and Coast Range foothills.

- Salt marsh harvest mouse. One small area potentially supporting salt marsh harvest mouse was identified in the Delta portion of the project route.

- Giant garter snake. Several perennial drainages were located along the Central Valley portion of the project route that potentially support giant garter snake.

- Foothill yellow-legged frog. Numerous drainages in the Coast Ranges portion of the project route were identified as having potential to support foothill yellow-legged frog.

- Northern red-legged frog. Several perennial drainages in the outer Coast Ranges portion of the project route were identified as having potential to support northern red-legged frog.

- Northern harrier. Potential breeding habitat for northern harriers was found along the project route in the Delta and Central Valley.

- Burrowing owl. Potential habitat for burrowing owls was found along the project route in the Delta and Central Valley portions of the project route.

Appendix K-4 provides the status, distribution, and habitat requirements of all special-status species initially identified as having potential to occur in the project study area, and the wildlife resource tables in **Appendix G** indicate locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of 21 special-status fish species were initially identified as having potential to occur in the project study area (**Appendix K-5**). Of these, eight state- or federally listed fish species and 13 nonlisted special-status fish species.

V. CULTURAL RESOURCES

Prehistory, Ethnography, and History

Detailed information regarding the prehistory, ethnography and history of the project study area is presented in the cultural resources inventory report currently being prepared. This report includes a description and synopsis of the prehistoric record as it is presently understood. The period spans from approximately 11,000 years ago to European contact. Specific cultural chronologies are discussed with reference to noted technological and cultural change during this time frame. The ethnographic section provides a brief overview of the history and culture of a number of distinct Native American groups living near the project study area at the time of European contact. The historic setting section focuses on major events during the historic era development of California. These major developments include early exploration, establishment of the California missions and land grants, United States settlement, farming and ranching, irrigation systems, transportation routes and railroads.

Project Study Area and Delineation of Area of Potential Effects

The project study area is defined as the location where the fiber optic cable and associated facilities would be installed using ground-disturbing techniques. This area includes both sides of the right-of-way for segments of the project route within existing railroad and road rights-of-way. The construction corridors for railroad and road rights-of-way typically extend to right-of-way fences and can vary between 2 and 10 meters (6.6 to 33 feet) in width. In segments where these fences did not exist, the right-of-way area included areas up to 20 (65.6 feet) meters from the edge of the road pavement and railroad ballast.

The project study area also included OP-AMP/regenerator station locations and any adjacent structures or historic resources that could be indirectly affected by siting of these facilities, the grading of existing access roads, and any staging areas located outside paved or graveled areas for equipment or bore pits.

The area of potential effects (APE) is defined as those areas where the project coincides with delineated wetlands and drainages under the jurisdiction of the Corps. These areas are therefore subject to the Section 106 process of the National Historic Preservation Act (NHPA). This limited APE occurs inside of the project study area defined above.

No new access roads would be required to install the fiber optic cable along the project route. Construction equipment and staging areas would be located within previously disturbed or developed areas where there is no potential to affect significant cultural resources.

Inventory Methods

Records Search and Cultural Resources Information

As part of the cultural resources inventory for the project, record searches and cultural resources survey information were obtained from a number of clearing houses for cultural resource information for previously documented sites. These records were obtained from Information Centers of the California Historical Resources File System, which included information on all previous surveys and previously recorded resources, as well as listings of properties on the California Register of Historical Resources, the National Register of Historic Places, California Inventory of Historic Resources, and California Historical Landmarks. Information research for this route was conducted primarily at the Northwest and North Central Information Centers at California State Universities, Sonoma, and Sacramento, respectively. (**Appendix M**).

In addition, agencies that maintain records of cultural resources in the project vicinity, such as the Native American Heritage Commission (NAHC) and the Bureau of Land Management (however, the project route would not cross land managed by the Bureau of Land Management), were contacted and consulted for information for documented cultural resources for the project route.

Historical research has been conducted for the project route where historic-period resources were likely to be found but where field inventory would be difficult because of factors that would limit ground surface visibility (e.g., subsequent development). For the project route, focused historical research has been conducted to determine whether historic or prehistoric resources might be buried beneath urban, developed settings. Repositories for sources dealing with historic resources include the California Room of the California State Library and other local repositories. At these repositories, historical maps were reviewed to determine the potential for disturbing potentially significant resources. Project-specific historical research is described in the cultural resources inventory report.

The records search included the identification of previous surveys or identified sites within 1/8 mile of the project study area. In some cases, this record search map area was expanded to a 1/4-mile area to better assess the archaeological resources recorded near the project route. The results of the records search indicated previously recorded sites located within the project study area, as well as results of previous surveys that have been conducted in or near the project study area. A summary of the methodology and results of the records search for the project route will also be provided in the cultural resources inventory report.

Native American Contacts

The California NAHC has been contacted to obtain information from their Sacred Lands Files, as well as to obtain lists of Native American individuals or organizations potentially interested in or having concerns about the project route. All individuals and organizations identified by the NAHC have been contacted by letter and asked to provide comments or identify any concerns or issues pertaining to the project route. A total of 50 Native American individuals and organizations were contacted. A copy of the list of Native Americans provided by the NAHC is included in the cultural resources inventory report currently being prepared for the project route and **Appendix M**. All correspondence from Native Americans will also be included in the cultural resources inventory report. An example of the Native American contact letter is also included in the inventory report. As of January 7, 2000, four responses from Native American groups or individuals contacted have been received. These responses are provided in **Appendix M**.

Field Survey Methods

Intensive field surveys have been conducted for the identified project route. Linear portions of the road and railroad rights-of-way, as well as regeneration/OP-AMP station locations, were surveyed. The surveys were conducted by multiperson crews walking the project study area at intervals that did not exceed 20 meters in width. Smaller sections of the project route were occasionally surveyed by an individual. As noted above, both sides of the railroad and road rights-of-way were surveyed. General environmental information, archaeological site and isolated artifact identification and locational data, were recorded on California Department of Parks and Recreation record forms and will be available to the CPUC.

The surveys were limited to inventorying surface artifacts and features. No other subsurface excavation or probing was conducted, and no artifacts were collected. Observed artifacts were left in place and documented. Cultural resources sites and isolates were photographed with isolates frequently field illustrated. Isolated artifacts found within the project study area were plotted on a USGS 7.5-minute quadrangle and briefly described in terms of artifact type, material, color, and other noteworthy characteristics.

Archaeological sites, isolated artifacts, and features encountered within the project study area were recorded, except for previously documented sites, which were revisited and re-recorded as necessary. Previously recorded sites were also revisited to verify resources information and determine if they extended into the project study area. All artifacts and features were noted to delineate site boundaries and assist with the character, configuration of sites, and densities of artifacts. Site characteristics were documented on the California Department of Parks and Recreation forms. Photographs showing overviews of the site within its environmental context were also taken. Work was completed at the sites when temporary site numbers were inscribed on metal tags and plastic surveyor=s Awhiskers@ were placed at each end of the site near the centerline of the project route. The identified cultural resource sites were assigned temporary field numbers according to their relationship to specific USGS 7.5-minute quadrangles, and will be plotted on the engineered drawings prior to construction. Site Atagging@ was conducted at sites that were located in or adjacent to the project study area. A complete list of the identified isolated artifacts and historic features are listed in the cultural resources inventory report.

The cultural resource inventory has been completed for the project route using the procedures described above. Measures to avoid potential impacts on identified cultural resources are specific to the identified resource. If avoidance proves infeasible, Williams has agreed to adopt the Mitigation Measure C-3, AConduct Test Excavation to Determine Resources Significance, and If Significant, Conduct Data Recovery Excavation@. Prior to construction, the cultural resources inventory report will be completed and submitted to the CPUC for its approval.

Regulations, Approvals, and Permits Applicable to Cultural Resources

State Regulations

As the state lead agency, the CPUC must ensure that the project would comply with CEQA requirements for the identification and treatment of historic and prehistoric cultural resources (Pub. Res. Code, Sec. 21082, 21083.2 and 21084.1 and California Code of Regs. 15064.5). This report complies with the requirements pertaining to cultural resources, as described in an expanded IS/MND approved by the CPUC for the Williams fiber optic cable system installation project (California Public Utilities Commission 1999).

Any resource that has been determined eligible for inclusion in the National Register of Historic Places (NRHP) would be considered eligible for the CRHR. Finally, an archaeological site if considered significant if it meets the definition of a unique archaeological resource as defined in Public Resources Code Section 21084.1 and Section 15126.4 of the State CEQA Guidelines.

The State CEQA Guidelines defines significant historical resources as Aresources listed or eligible for listing on the California Register of Historical Resources@ (CRHR) (Public Resources Code Section 5024.1) A historical resource may be eligible for inclusion in the CRHR if it:

- is associated with events that have made a significant contribution to the broad patterns of California=s history and cultural heritage;
- is associated with the lives of persons important in the past;
- embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
- has yielded, or may be likely to yield, information important in prehistory or history.

Because the project is a discretionary action under CEQA and crosses land under state and local jurisdiction, it is also necessary for the project to comply with state laws (Pub. Res. Code, Sec. 5097) pertaining to the inadvertent discovery of human remains of Native American origin. The procedures that must be followed if burials of Native American origin are encountered during project construction are described below.

Because implementation of the project would require a permit from the Corps and historic properties could be affected, it is necessary to comply with Section 106 of the NHPA and its implementing regulations (36 Code of Federal Regulations [CFR], Part 800). Section 106 requires federal agencies to consider the impacts of their actions on properties that may be eligible for listing or are listed in the NRHP.

To be listed in the NRHP, a property must be at least 50 years old and evaluated as significant (or if less than 50 years old, be of exceptional historic significance). To qualify for listing in the NRHP, a property must represent a significant theme or pattern in history, architecture, archaeology, engineering, or culture at the local, state, or national level. It must meet one or more of the following four criteria and have sufficient integrity to convey its historic significance.

The criteria for evaluation the eligibility of cultural resources for listing in the NRHP are defined in 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association, and:

(1) that are associated with events that have made a significant contribution to the broad patterns of our history; or

(2) that are associated with the lives of persons significant in the past; or

(3) that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(4) that have yielded, or may be likely to yield, information important in prehistory or history.

The Corps is the federal lead agency responsible for compliance with Section 106 of the NHPA. As such, the Corps is responsible for any coordination or consultation with the California State Historic Preservation Officer (SHPO). No other permitting or land holding federal agencies have been identified for this project.

To determine whether an undertaking could affect NRHP-eligible properties, cultural sites (including archaeological, historical, and architectural properties) must be inventoried and evaluated for eligibility for listing in the NRHP. Although compliance with Section 106 is the responsibility of the federal lead agency, the work necessary to comply can be delegated to others.

The Section 106 review process is implemented using a five-step procedure:

- Identify and evaluate historic properties.

- Assess the impacts of the undertaking on properties eligible for listing in the NRHP.

- Consult with the SHPO and other agencies for the development of an agreement that addresses the treatment of historic properties.

- Receive Advisory Council on Historic Preservation comments on the agreement or results of consultation.

- Implement the project according to the conditions of the agreement.

Only those portions of the project route under the jurisdiction of the Corps are subject to the requirements of Section 106 of the NHPA.

Results of Inventory

The entire project route has been surveyed and inventoried for cultural resources (**Appendix G**). This research identified a total of 17 cultural resources sites, which included 13 prehistoric sites and five historic sites. Two of the 12 sites (Ca-Son-1787/H and Ca-Son-455/H), contained prehistoric and historic resources. Only one new site (C-Napa-2) was discovered during the cultural resources survey. This resource exists outside the project study area and would not be affected by project construction. The records search inventory identified an actual higher number of previously recorded sites as being present along the project route, but these resources also existed outside the project study area or were no longer present. Cultural resources identified during the record search that fell outside the project study area would be documented in the cultural resources inventory report.

Thirteen of the prehistoric sites, were found to exist within the project study area and can be avoided by boring under or routing the fiber optic conduit and cable around the resource. Because the fiber optic conduit and cable would be directed to avoid these resources sites, by boring or routing around them, they would not be affected by project construction. Of the four exclusive historic cultural resource sites, one is the Vallejo=s adobe building and three were linear resources (an historic era quarried stone culvert, a section of the Northwest Pacific Railroad grade, and a manually constructed stone wall). The fifth historic resource was a small stone masonry bridge the only new resource recorded. This resource existed outside the project study area and would not be affected by construction activities. The two historic sites that occurred in conjunction with the prehistoric sites included the Petaluma Hill Dairy structures and 1870s debris (Ca-Son-1787/H) and the historic period Gables House (Ca-Son-455/H). As noted, the project would not affect any standing structures, while the remaining linear resources would be avoided by placing the fiber optic cable just outside the railroad grade and boring underneath the quarried stone culvert. Avoidance measures for these two resources sites containing both prehistoric and historic resources would be comprehensive, so as to avoid both prehistoric and historic site elements.

Because the project route can be directed around or under the identified prehistoric and historic resources sites, none would be affected because the project would avoid sites, including culverts, existing structures, railroad grades, and ballast areas. The specific avoidance measures that would be used for these resources sites are provided in Chapter 5, AEnvironmental Impacts and Mitigation Measures@. However, if significant or potentially significant resources are discovered during construction, then work would stop until the significance of the resource could be determined and, if necessary, mitigation measures implemented.

In addition to the 19 cultural resources sites, several isolated prehistoric and historic artifacts were found or previously recorded. The isolated artifacts included a mano and a piece of historic solarized glass. A complete list and inventory of these resources will be presented in the inventory report. Although isolated artifacts are often important for gaining some general information about land use patterns, they are not considered significant cultural resources.

Paleontological Resources

Fossils are considered by the Society of Vertebrate Paleontology to be a non-renewable resource. One purpose of a paleontological investigation is to document the presence of fossils in the geologic record to provide a better understanding of the phylogenetic histories of species in the area or in general and provide keys to the history of evolution. In addition to revealing which species were present, the fossil record can give indications of previous climates and paleotemperatures, topography, geography, rainfall, and proximity to water bodies.

The project route would generally cross Jurassic to Recent age geologic units and has a low to high sensitivity for paleontological resources (**Table 4B.V-1**). All identified paleontological resource sites located along the project route would be avoided.

Approach and Methodology

A literature search was conducted to determine the paleontological sensitivities of geologic units and paleontological localities previously identified along the project route. The literature search consisted of a search and review of available published and unpublished literature, including locality information from the California Museum of Paleontology and Los Angeles County Museum, paleontological survey reports, and paleontologic locality maps. Interviews were conducted with Dr. Larry Barnes and Dr. Ed Wilson of the Los Angeles County Museum to develop the sensitivities and significance of paleontological resources of the geologic formations along the project route.

Published and unpublished literature indicates that the project route and surrounding areas would be underlain by bedrock formations that have a low to high paleontological sensitivity (**Table 4B.V-1**). Paleontological sensitivities of geologic units are determined by the potential for the recovery of fossil resources. Determining factors include the known fossil resources in the geologic unit, sedimentary rock types present, and the environment of deposition of the geologic unit.

Regional geologic maps for California identified geologic units, surficial sedimentary rocks, and cool volcanic flows that would be present on the project route (California Division of Mines and Geology 1977, Jones & Stokes Associates 1990). Although the presence of these deposits does not necessarily indicate the presence of fossils, these formations have the highest probability of preserving plant, animal, and invertebrate remains. **Table 4B.V-1** summarizes the geologic units, age, and paleontological sensitivity for the project route. Fossilized micro and macro flora and fauna of marine and non-marine origin, including marine vertebrates, land mammals, and other vertebrates, have been recovered from formations exposed along the project route. **Appendix N** lists previously identified fossil localities that would be located on the project route.

Table 4B.V-1. Paleontological Sensitivity of Geologic Units Potentially Occurring in the Project Study Area

Geologic Units	Age	Paleontological Sensitivity
Valley Alluvial fill	Recent	Low
Basin filling deposit	Recent	Low
Stream and channel deposits	Recent	Low
Intertidal sediments	Recent	Low
Quaternary terrace deposits (marine and non-marine)	Pleistocene	High
Dissected Alluvial deposits (non-marine)	Pleistocene	High
Petaluma Formation	Pleistocene	High
Montezuma Formation	Pleistocene/Pliocene	High
Huichica Formation	Pleistocene/Pliocene	High
Sonoma volcanics	Pliocene	High
Gallaway-Schooner Gulch Formations	Miocene	High
San Pablo group	Miocene	High
Monterey Formation (marine)	Miocene	High
Markley Formation	Eocene	High
German Ranch Formation	Paleocene	High
Coastal belt Franciscan (marine, sandstone, shale, and conglomerate)	Paleocene/Cretaceous	High
Chico/Gualala Formation/marine sediments	Upper Cretaceous	High
Marine rocks	Cretaceous	High
Great Valley Sequence marine rocks	Cretaceous	High
Marine sediments	Lower Cretaceous	High
Franciscan Formation	Jurassic	Varies

Applicable Regulations, Approvals, and Permits

The Antiquities Act of 1906 and the Federal Land Policy and Management Act of 1976 mandate the protection of significant paleontological resources on federally owned, managed, or controlled lands. Additionally, California Pub. Res. Code Section 5097.5 states that it is a misdemeanor for any person to knowingly and willingly excavate, remove, or destroy a vertebrate paleontological site, including fossilized footprints or any other paleontological feature on public lands without the permission of the public agency having jurisdiction over the land.

VI. GEOLOGY AND SOILS

Geology

The geologic map of the Santa Rosa quadrangle (Wagner and Bortugno 1982) and the geologic map of the Sacramento quadrangle (Wagner et al. 1981) were used to assess existing geologic conditions along the project route.

Mendocino and Sonoma Counties

North of Cloverdale the project route would cross terrain composed of sedimentary and metasedimentary rocks of the Franciscan Complex. Between Cloverdale and Petaluma the project route would primarily cross over Quaternary alluvial deposits and undifferentiated fluvial deposits. Small portions of the project route between Lytton and Chiquita would cross terrain composed of marine sedimentary rocks of the Lower Cretaceous Great Valley Sequence and sedimentary and metasedimentary rocks of the Franciscan Complex.

Between Petaluma and the eastern boundary of Sonoma County, the project route would cross nonmarine and marine sedimentary rocks of the Petaluma Formation; Tertiary volcanic rocks in the Sonoma Mountains; and various alluvial, fluvial, and intertidal deposits in the Petaluma and Sonoma Valleys.

Napa County

The portions of the project route would pass through Napa County cross over various Quaternary alluvial deposits, undifferentiated fluvial deposits of the Huichica and Glen Ellen Formations, intertidal deposits, and marine sandstones and shales.

Solano, Yolo, and Sacramento Counties

The portions of the project route that are between the boundary of Napa and Solano Counties and the City of Fairfield would cross terrain composed of Tertiary marine sandstones, intertidal deposits, and Quaternary alluvial deposits. Between Fairfield and Sacramento, the project route would cross terrain composed various types of alluvium, including basin alluvium and levee and channel deposits.

Seismicity

The map showing recency of faulting, Santa Rosa quadrangle (Bortugno 1982) and the geologic map of the Sacramento quadrangle (Wagner et al. 1981) were used to assess existing seismic conditions along the project route.

The project route may pass through areas that are subject to strong earthquake-induced ground shaking. Furthermore, certain portions of the project route in each of the five of the six counties listed above are in the immediate vicinity of or pass directly over active and potentially active earthquake faults. The faults are subject

to ground surface displacement, which may occur in a variety of relative motions depending on the type of fault involved.

In some areas, sediments underlying the project route may also be subject to earthquake-induced liquefaction, which may cause differential ground settlement and lateral spreading. Conditions most favorable for liquefaction include a fault capable of causing ground shaking and the presence of clean, loose, saturated sandy soils within 50 feet of the ground surface.

Soils

Information on existing soil conditions along the project route was gathered from the soil survey of Sonoma County (Miller 1972), the soil survey of Napa County (Lambert and Kashiwagi 1978), the soil survey of Yolo County (Andrews 1972), the soil survey of Solano County (Bates 1977), and the soil survey of Sacramento County (Tugel 1993).

Native soil characteristics vary widely throughout the areas that would be crossed by the project route. This variation is natural and is largely because of the wide range of topography, parent material, climate, and vegetation along the project route. Soils along the project route are described below as they exist in their natural, undisturbed state. However, most of the project route is located within existing transportation corridors where natural soil conditions are not likely to exist because of disturbances associated with past construction activities. In general, soils within these corridors should be less susceptible to accelerated erosion and landsliding due to attenuated slope gradients and to runoff management practices already in place.

Mendocino and Sonoma Counties

Soils along the project route northwest of Cloverdale consist of deep to moderately deep loams to clay loams on gently to steeply sloping uplands. Runoff is slow to very rapid and the erosion hazard is slight to very high.

Between Cloverdale and Windsor, soils exist mostly on level to gently sloping surfaces in the Alexander, Dry Creek, and the Russian River Valleys. They consist of moderately deep to deep gravelly loams and gravelly sandy loams underlain by recent alluvial deposits. In some areas, a clay loam subsoil is present. Runoff is slow and the erosion hazard is slight. Some soils along this portion of the project route may classify as Aexpansive@ under the Uniform Building Code. Small portions of the project route between Lytton and Healdsberg cross upland areas where soils consist of gravelly loams and clay loams on gently to very steeply sloping uplands. In these areas, runoff is slow to very rapid and the erosion hazard is slight to very high.

Soils along the project route that occur between Windsor and Cotati consist of moderately deep to deep loams to silty clay loams underlain by old alluvial deposits. The exist on level to gently sloping surfaces where runoff is very slow and the erosion hazard is slight to nonexistent.

Two general soil types occur along the project route between Cotati and Petaluma. The first consists of soils formed in nearly level basins and tidal marshes near San Pablo Bay. They are moderately deep to deep clays and silty clays underlain with alluvial deposits. Runoff is slow to very slow, and the erosion hazard is slight to nonexistent. The second type consists of soils formed on gently sloping uplands. They are moderately deep to deep clay loams and clays underlain by old alluvial deposits. In these areas, runoff is slow to moderate and the erosion hazard is slight to moderate. Both soil types may classify as Aexpansive@ under the Uniform Building Code.

Napa County

Most soils along the project route in Napa County exist on nearly level to moderately sloping surfaces. Soils in nearly level basins and tidal flats generally consist of deep clays and silty clays. Runoff is slow to very slow and the erosion hazard is slight to nonexistent. These soils may classify as Aexpansive@ under the Uniform Building Code. Soils on sloping surfaces generally consist of deep to moderately deep gravelly loams, loams, and clay loams underlain by deep alluvial deposits. In these areas, runoff is slow to medium and the erosion hazard is slight to nonexistent.

Small portions of the project route between Highway 29 and the eastern boundary of Napa County cross moderately sloping to steep upland areas where soils consist of shallow to moderately deep loams and clay loams underlain by weathered sandstone and siltstone. Runoff is medium to very rapid and the erosion hazard is moderate to high. In upland areas where soil textures are clay loam or finer and slope gradients exceed approximately 30%, soils may be subject to landsliding.

Solano County

Between the western boundary of Solano County and Interstate 80, the project route crosses gently sloping to steep uplands. In these areas, soils primarily consist of moderately deep to deep, loams and clay loams underlain by weathered sandstone. Runoff is medium and the erosion hazard is slight to moderate.

Between Interstate 80 and the boundary of Yolo County, the project route crosses soils formed in basins and on nearly level to moderately sloping surfaces. Soils on moderately sloping surfaces primarily consist of deep to very deep loams and clay loams underlain with alluvium. Runoff is slow and the erosion hazard is slight to nonexistent. Soils formed in nearly level to gently sloping surfaces primarily consist of deep to very deep silty clay loams and clay loams underlain with alluvium. Runoff is very slow and the erosion hazard is slight to nonexistent. Soils along this portion of the project route may classify as Aexpansive@ under the Uniform Building Code.

Yolo County

Soils along the project route in Yolo County exist in basins and on nearly level to gently sloping surfaces. Soils in basins consist of deep to very deep silty clay loams and clays underlain with alluvium. Runoff is very slow and the erosion hazard is slight to nonexistent. Soils on nearly level to gently sloping surfaces consist of deep silty clay loams and loams underlain with alluvium. Runoff is very slow and the erosion hazard is slight to nonexistent. Soils along this portion of the project route may classify as Aexpansive@ under the Uniform Building Code.

Sacramento County

Soils along the Sacramento County portions of the project route primarily exist on artificially drained natural river levees, low floodplains, and the edges of wetlands. They consist of very deep silt loams, clay loams, and sandy clay loams underlain with alluvium. Runoff is very slow and the erosion hazard is slight to nonexistent.

Regulations, Approvals, and Permits Applicable to Geology and Soils

A storm water pollution prevention plan (SWPPP) (which includes erosion and sediment control measures) is required by EPA to comply with National Pollutant Discharge Elimination System (NPDES) requirements. The EPA has delegated authority to the State Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs) to administer the NPDES program. A SWPPP for the project route has been prepared (**Appendix E**).

VII. HAZARDS AND HAZARDOUS MATERIALS

Hazards and hazardous materials issues include handling of hazardous materials, disposal of hazardous waste (unexpectedly encountered during trenching and construction activities), training of construction workers (responsibility of the construction contractor), and the potential risk of upsetting and exposing to the community from an unexpected release or spill and fire hazards. The CEQA environmental checklist (**Appendix A**) identifies eight areas of potential concern under the issue of hazards and hazardous materials.

A search of several government database resources was conducted for the project route. The database lists more than 3.5 million regulated and unregulated hazardous waste generators, leaking tank sites, toxic spills, and other sites affecting the environment throughout the United States. An information technology firm was retained to perform a search to seek out specific environmental hazards that would be within 1,000 feet of the centerline of project route and sort and standardize the data obtained from this database. The result is a complete library of environmental information that will be translated into mapped and site-specific reports for all aspects of a hazards analysis. The following databases were included in the search:

- National Priority List;
- RCRA Corrective Actions;
- RCRA permitted treatment, storage, disposal facilities;
- State equivalent priority list;
- State equivalent Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) list;
- Sites under review by EPA (CERCLIS/Archive [NFRAP] database);
- Leaking Underground Storage Tanks;
- Solid waste landfills, incinerators, or transfer stations;
- Additional federal, state and regional lists, where available;
- Toxic Release Inventory database;
- Registered underground storage tanks;
- Registered aboveground storage tanks;
- RCRA registered small or large generators of hazardous waste;
- RCRA violations/enforcement actions; and
- Emergency Response Notification System and state spills lists.

The results of the database search would assist in reviewing the project route and OP-AMP/regenerator station locations to ascertain existing contaminated areas and potential areas where hazardous substances should be avoided during construction activities.

Site specific hazardous materials reports are being prepared for each of the four OP-AMP/regenerator stations. Environmental transaction screen (ETS) reports are used to evaluate the sites for recognized hazards caused by current or past activities or site conditions. This ETS strives to provide Aall appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice in an effort to minimize liability@, as stated in the Comprehensive Environmental Response, Compensation and Liability Act, (42 U.S.C. 9601, et. seq., liability).

Williams has retained the services of an environmental firm to prepare the ETS assessments of the four OP-AMP/regenerator stations. These assessments, performed in accordance with the American Society for Testing and Materials (ASTM) standards, include the following scope of work:

- a site reconnaissance to assess existing conditions and evaluate, if possible, potential environmental concerns at the site;
- a reconnaissance of the immediate site vicinity to evaluate surrounding land use and make relevant observations regarding the potential for environmental concerns to exist in this vicinity;
- a review of regulatory agency database lists to evaluate reported environmental problems in the vicinity of the project route (see above project route search database list);
- an interview with the landowner;
- completion of an environmental transaction screen questionnaire; and
- preparation of the ETS report documenting the findings of the study.

If conditions onsite are determined to have recognized environmental concerns, further assessment may be required depending on site conditions and Williams= approval.

Regulations, Approvals, and Permits Applicable to Hazards and Hazardous Materials

A variety of regulatory issues pertain to the handling and disposal of hazardous materials and waste, including proper training of personnel handling such materials.

Workers exposed to hazardous waste (unexpectedly encountered during construction) should be properly trained in accordance with Occupational Safety and Health Administration (OSHA) guidelines[1]. This training allows for worker safety, proper handling, knowledge of testing instruments, and safety equipment (e.g., respirators).

Hazardous waste is to be handled and disposed of in accordance with applicablee local, state, and federal regualtions. Local jurisdictions (e.g., city or county health departments) may have area-specific requirements.

Consultation and coordination with regulatory land managers is required along certain portions of the project route that may be susceptible to fire hazards.

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[1] Refer to OSHA=s Hazardous Waste Operations and Emergency Response (HAZWOPER) fact sheet 93-31, which specifies training for workers at hazardous materials sites (available http://www.osha-slc.gov/OshDoc/Fact_data/FSNO93-31.html)

VIII. HYDROLOGY AND WATER QUALITY

Hydrologic Setting

The project route would cross several geographically separated drainage areas of Coast Mountain Ranges, including the Russian and Navaro River valleys, tributary drainage areas to San Pablo Bay (the Petaluma River, Sonoma Creek, and the Napa River), and tributaries of the Yolo Bypass and Sacramento River watersheds. In addition to numerous small intermittent and perennial stream crossings, the project route would cross the Garcia River, the Russian River, Sonoma Creek, the Napa River, South Fork of Putah Creek, Yolo Bypass, and the Sacramento River.

Precipitation

Precipitation over the north coastal portions of California are higher than any other area of the state, and damaging floods are a fairly frequent hazard. Mean annual precipitation in the coastal portions is high, ranging from 80 inches at coastal and mountainous locations to 40 inches at interior valley locations. The northern San Francisco Bay region experiences a moderate climate with annual precipitation ranging from 25 to 35 inches, depending on location and elevation. The eastern portion of the project route is located in the Sacramento Valley where annual rainfall is approximately 20 to 25 inches. The climate is moderate and temperature extremes are minimal on the coast, whereas seasonal temperatures can vary by 100EF at inland locations.

Water Quality

Streams that would be found along the project route are subject to great changes in volume because of seasonal variations in precipitation and runoff. Headwater streams are generally cool and clear; water quality is good and linked closely to the condition of the bed and banks of the stream channel. Degraded conditions most often consist of high sediment loads, which are a function of mass wasting (naturally unstable lands and management-influenced failures) and surface erosion processes (roads, developments, and other nonpoint sources). Removal of riparian vegetation also interrupts processes that maintain stream water quality.

As water enters the valleys, waters become warmer and tend to accumulate increased sediment and other pollutants in urban communities and agricultural areas. Water quality decreases because of the additional influences of urban and industrial development, diversions, agricultural runoff, additional loss of riparian vegetation, and other factors.

Water Uses

Beneficial water uses of water bodies that would be crossed by the project route generally include domestic and municipal water supply, recreation, agriculture, industrial uses, and protection of fish and wildlife. No aspect of this project would change surface or subsurface flows; thus, the project would not affect groundwater or surface water sources for these beneficial uses.

Floodplains

Federal Emergency Management Agency- (FEMA-) designated floodplains are identified for larger streams, including the Garcia River, Russian River, Sonoma Creek, Alamo Creek, Ulatis Creek, South Fork of Putah Creek, Yolo Bypass, and Sacramento River; floodplain information is rarely available for small rural streams in unpopulated areas. No aspect of this project would substantially change flood conveyance or floodplain characteristics of drainage channels in the project study area.

Regulations, Approvals, and Permits Applicable to Hydrology and Water Quality

California=s nine RWQCBs are primarily responsible for identifying beneficial uses of surface and groundwater resources and establishing water quality standards and implementation programs to protect those uses. The proposed project route passes through three RWQCBs. The western portion of the proposed route is in the North Coast region; the central portion of the project route, between Healdsburg and south of Fairfield, is within in the San Francisco Bay region; and the eastern portion of the project route is in the Central Valley region. Section 303(d) of the Clean Water Act requires each state to maintain a list of water quality limited streams that are impaired by the presence of pollutants, including physical and chemical characteristics. The Garcia, Navarro, and Russian River drainage basins are listed as impaired by sediment; the Petaluma River, Sonoma Creek, and Napa River basins are listed for sediment, nutrients, and pathogens; and the Sacramento River is listed as impaired by sediment, nutrients, and toxic constituents. The North Coast RWQCB is currently completing a Total Maximum Daily Load (TMDL) program for the Garcia River that will regulate that allocation of allowable sediment discharges in the watershed by land disturbing activities. Under the TMDL program, land management activities may opt to meet general elements of the RWQCB=s Garcia River Sedimentation Reduction Plan (SRP) or submit a site-specific SRP. Required elements of SRPs include preparing an inventory of existing sites in the project area that generate sediment, assessment of unstable areas, and monitoring of sediment reduction practices that are used.

If soil disturbance exceeds 5 acres, a general construction activity permit under the National Pollutant Discharge and Elimination System (NPDES) (Section 402 of the Clean Water Act) requires preparation and implementation of a storm water pollution prevention plan (SWPPP). Best management practices to reduce and control stormwater discharges related to project construction would be specified in the SWPPP. Construction activities subject to the NPDES permit restrictions would be administered by the appropriate RWQCB for each project route segment. Williams would prepare the SWPPP and acquire authorization under the general NPDES permit prior to starting construction. RWQCB staff are expected to inspect construction practices for compliance with the SWPPP and TMDL requirements; Williams will ensure that construction practices are implemented consistent with RWQCB requirements for these programs.

A Section 401 water quality certification (or waiver) from the appropriate RWQCBs are being required under the Clean Water Act and would be obtained by meeting the terms and conditions in Section 404 Nationwide Permit No. 12, issued by the Corps, as appropriate. Nationwide Permit No. 12 authorizes discharge of material for backfill or bedding for utility lines. Under Nationwide Permit No. 12 conditions, an applicant must demonstrate that any unavoidable in-water work would occur within the state lead agency=s preferred work windows and all practicable erosion control measures would be implemented.

The DFG regulates streambed alterations, including the release of materials into streams, under Section 1603 of the Fish and Game Code (see AState Policies and Regulations Concerning Waters of the United States@ in the ABiological Resources@ section of this chapter). Williams would obtain streambed alteration agreements from the DFG where necessary.

Local county flood control and water conservation districts typically are responsible for coordinating flood control programs and emergency preparedness and response plans. The FEMA maps and designates floodplain areas for avoiding flood-related loss of life or property, and managing flood insurance programs.

IX. LAND USE AND PLANNING

Land use planning is the province of local government in California. Each city and county is required to adopt a Ageneral plan@ that establishes goals and policies for long-term development, protection from environmental

hazards, and conservation of identified natural resources. Typically, a general plan lays out a pattern of future residential, commercial, industrial, agricultural, open space, and recreational land uses within a community. Zoning, the primary means of implementing these plans, identifies the specific types of land uses that may be allowed on a given site. Zoning also establishes the standards that will be imposed on new development.

Local approaches to zoning vary considerably throughout the state. In general, zoning requirements are more restrictive along the coast and less restrictive in unincorporated portions of counties. The OP-AMP/regenerator stations associated with the project may be subject to zoning requirements in some jurisdictions. Williams is currently in the process of identifying local zoning and permit requirements and approvals.

The project route is described in Chapter 3, AProject Route Description@. The project route would be located predominantly in state highway and county road rights-of-way, with a few short private road segments. As such, it would not be in conflict with local general plans. The project crosses Mendocino, Sonoma, Napa, Solano, Yolo Sacramento Counties and the communities of Manchester, Cloverdale, Healdsburg, Santa Rosa, Cotati, Rohnert Park, Petaluma, Cordelia, Fairfield/Suisun city, Davis, and Sacramento. Each of these jurisdictions has its own land use and zoning regulations. Williams is in the process of identifying those land use and zoning requirements applicable to the project.

Four OP-AMP/regenerator stations would be constructed along the project route: west of Yorkville in Mendocino County, between the communities of Windsor and Fulton in Sonoma County, near Schellville in Sonoma County, and northeast of Elmira in Solano County. Construction of OP-AMP/regenerator stations may be subject to conditional use permits, which would require a finding of consistency with local general plans. Permitting and zoning requirements for these sites are described in **Table 4B.IX-1**.

Table 4B.IX-1. Permitting and Zoning Requirements for OP-AMP/Regenerator Stations on the Point Arena to Sacramento Project Route

OP-AMP/ Regenerator Station	Location	Zoning	Permitting	Comments
Yorkville	Mendocino County, California; adjacent to Highway 128, 1 mile east of Highway 128/Fish Rock Road intersection	RL. Rangeland	No permit required	County designated agricultural preserve
Windsor/Fulton	Sonoma County, California; approximately **2** mile southwest of the Highway 101/Shiloh Road intersection	I. Industrial	Conditional use permit required	
Schellville	Sonoma County, California; adjacent to SR 12/121, approximately 1.5 miles west of SR 12/121/Napa Road intersection	DA. Diverse Agriculture	Conditional use permit required	Located near county scenic route corridor
Elmira	Solano County, California; 1/4 mile northeast of Elmira, adjacent to the Union Pacific Railroad	A-20. Agriculture, 20-acre minimum	Conditional use permit required	Located near county Scenic Route corridor and in an open agricultural area

Regulations, Approvals, and Permits Applicable to Land Use and Planning

Zoning regulations vary from jurisdiction to jurisdiction along the proposed route. In some jurisdictions, construction is permitted Aby right@ (i.e., without the need for hearing) as an allowable use under the zoning ordinance. In others, a conditional use permit or similar discretionary action would be needed. Typically, discretionary actions require a noticed public hearing on the proposal. At the hearing, the local zoning board or zoning administrator would consider the proposal, public testimony, and the findings of a CEQA review. If approved, the proposed project would be made subject to conditions relating to its design, appearance, and construction intended to comply with local ordinance and environmental quality requirements.

X. MINERAL RESOURCES

Sand and gravel deposits are the minerals most likely to be found along the project route. Such deposits are typically found in streambeds and valley bottoms.

This project route has four OP-AMP/regenerator sites. No mineral land classification mapping has been done for these sites or their surrounding areas. However, installation of conduit and cable and OP-AMP/regenerator stations would be within existing, disturbed rights-of-way and would not impede mineral extraction. Therefore, mineral zone classifications of the project route and OP-AMP/regenerator sites are irrelevant.

Regulations, Approvals, and Permits Applicable to Mineral Resources

Land use documents, including general plans, specific plans, and the CEQA environmental checklist, typically include policies that limit development of facilities in areas that contain mineral resources.

The California Surface Mining and Reclamation Act (SMARA) (Pub. Res. Code Section 2710 et seq.) establishes statewide mineral conservation policies that are implemented by counties and cities through local surface mining ordinances. The ordinances apply to surface mining operations and would not be applicable to the project. However, these policies discourage local governments from allowing new incompatible uses (essentially defined as permanent, urban uses) in areas identified by the state geologist as containing mineral resources that are either locally important or of statewide value.

The SMARA requires the state geologist to examine lands within California and classify them based on the availability of mineral deposits. The conduit and cable would be installed within existing rights-of-way, only to a depth of 4 feet, and would not involve mineral excavations. The lines would not obstruct the recovery of mineral deposits. The OP-AMP/regenerator sites would not be constructed in areas of mineral extraction. Because the conduit and cable and the OP-AMP/regenerator sites would not have any impact on mineral resources, the project would not require compliance with the SMARA.

XI. NOISE

The technical terms and acronyms used in this section may be unfamiliar to the reader. Explanations of these terms, acronyms (e.g., *dBA*, *Ldn*, and *Leq*), and background information on environmental acoustics and state and federal noise regulations are provided in **Appendix O**.

Residencies, such as private homes, hospitals, and rest homes, are typically considered to be sensitive to noise, as are libraries and educational facilities. Threatened and endangered wildlife species are also considered to be noise sensitive in some cases. The number and type of noise sensitive uses along the project routes would vary, depending on the degree of development in the area. In some areas, residences or other sensitive uses

would be located within 100 feet of the project route. In other areas, the distance between the project route and the nearest noise-sensitive uses would be several thousand feet. However, because the project route is primarily located within existing rights-of-way, any sensitive receptors are often already exposed to noise sources (i.e., railroad and roads).

Background noise levels along the project route would also vary widely depending on the degree of development and general human activity in the area. For example, railroad and road rights-of-way would typically have greater background noise associated with trains and automobiles. Typical sources of noise include transportation (e.g., traffic, aircraft, train, watercraft), mechanical equipment (e.g., air conditioners, manufacturing equipment), and natural sources (e.g., wind, birds, crickets, frogs). Background sound levels typically range from 35 to 45 dBA in rural areas, 45 to 55 dBA in suburban areas, and 55 to 65 dBA in urban areas.

Regulations, Approvals, and Permits Applicable to Noise

California Government Code Section 65302(f) requires that city and county general plans include a noise element. The general plan noise element is used as a planning guideline to ensure that long-term noise generated by a source is compatible with adjacent land uses.

The California Department of Health Services (DHS) has studied the correlation between noise levels and their effects on various land uses and published land use compatibility guidelines for the noise elements of local general plans (Office of Planning and Research 1990). These guidelines are the basis for most noise element land use compatibility guidelines in California, identifying the normally acceptable noise level range for several different land uses. Recommended maximum acceptable noise levels for various land uses are shown in **Table 4.XI-1**.

Table 4B.XI-1. Maximum Allowable Ambient Noise Exposure for Various Land Uses

Land Use	Suggested Maximum Ldn
Residential - low density	60
Residential - high density	65
Transient lodging	65
Schools, libraries, churches, hospitals	70
Auditoriums	70
Playgrounds, parks	70
Commercial	70
Industrial	75

Source: Office of Planning and Research 1990.

As shown in **Table 4B.XI-1**, low-density residential areas are most sensitive to noise intrusion, with noise levels of 60 dBA Ldn or below considered acceptable. Acceptable noise levels for schools, libraries,

churches, hospitals, and parks is 70 Ldn or below, and 70 and 75 Ldn or below, respectively, for commercial and industrial land uses.

Cities and counties can also adopt noise control requirements as part of their zoning ordinances or as separate ordinances. Noise ordinances are enforcement mechanisms for controlling noise. The level of specificity in noise ordinances used in California cities and counties varies widely. Many are based on the model noise ordinance published by DHS, which recommends daytime and nighttime noise level limits of 40 and 50 dBA-L_{50}, respectively, for rural uses; 45 and 55 dBA-$L_{50,}$ respectively, for suburban uses; and 50 and 60 dBA-L_{50}, respectively, for urban uses. Noise ordinances often contain exemptions for construction activities, if the construction occurs during the hours specified by affected local jurisdictions.

Mendocino and Yolo Counties do not have adopted noise ordinances. Each of the municipal areas within those counties are responsible for their own noise ordinances. Napa County=s noise ordinances are based on the model noise ordinance for the state. The ordinance states that construction is allowed 7 days a week from 7 a.m. to 7 p.m. at any decibel level.

There is no noise ordinance for Solano County; however, each city has its own noise standards with which the project would comply.

In Sonoma County, there are no noise ordinance. On a project where noise may be an issue, the county may apply limitations to a use permit. Each of the municipal areas within the county is responsible for their own noise ordinances.

In the City of Sacramento, construction can occur from 7 a.m. to 6 p.m. Monday through Saturday and from 9 a.m. to 6 p.m. on Sundays.

XII. POPULATION AND HOUSING

Implementation of the project would not affect or generate additional population or affect or create demand for new housing along the Point Arena to Robbins project route. Therefore, no discussion of the setting for population and housing is necessary.

XIII. PUBLIC SERVICES

Public services are typically provided to development projects by a variety of local purveyors (i.e., city, county, special district, water agency, school district). The services available vary depending on the level of development in the area. This project would not result in an increased demand for public services, such as police protection, schools, parks, or other public facilities, because project construction would be temporary and located within existing railroad and road right-of-ways. A fire prevention and management plan would be prepared as a precaution, and any impact on fire protection services would be less than significant (**Appendix J**). Therefore, because public services would not be affected, no discussion of the public services setting is necessary.

XIV. RECREATION

Public recreation facilities are provided by cities, counties, and special districts. The types and uses of these recreation facilities vary greatly. This project would be located within disturbed railroad and road rights-of-way, and would not cross any parks or land where recreational facilities exist. The project would not affect recreational opportunities in any of the counties through which the project would be implemented; use of existing facilities would not increase and construction of additional facilities would not be necessary. Therefore, no further discussion of the recreation setting is necessary.

XV. TRANSPORTATION/TRAFFIC

California is served by a well-developed network of freeways, highways, and surface streets, as well as mass transit facilities in the larger urban areas of the state, such as the San Francisco Bay Area, the Los Angeles metropolitan area, and the Sacramento metropolitan area. The project route would pass through rural, suburban, and urban areas of Northern California. In suburban and urban settings, development tends to directly abut surface streets. In rural areas, the rights-of-way adjacent to the road pavement are generally undeveloped.

The project route would follow a combination of state highways, local roads, private roads, and railroad rights-of-way (**Table 4B.XV-1**). State highways (freeways) are under the jurisdiction of the Caltrans, which controls the design, operation, and maintenance of these roadways. The local roadway system comprises roads that are under the jurisdiction of a particular city or county public works department. As described in Chapter 2, "Project Description", the installation of fiber optic cable would be accomplished primarily by plowing or trenching along one side of the road or railroad right-of-way. The project route is summarized below in **Table 4.XV-1**.

Table 4B.XV-1. Right-of-Way Miles - Point Arena to Sacramento

Route Segment	Right-of-Way Miles			
	Local Roads	State Highways	Rail-road	Private Road
Kinney Road*	0.95			
State Route 1*		6.21		
Riverside-Eureka Hill Road*	2.85			
Ten Mile/Cutoff Road*	5.91			
Iverson Road*	1.85			
Fish Rock Road*	25.49			
State Route 128*		19.09		
Cloverdale Boulevard	0.14			
McCray Road	0.28			
North Coast Pacific Railroad			10.89	
West Grant Road	0.04			
Grove-Vine Road	0.62			
Mill Road	0.28			
Kinley Road	0.99			
Highway 101 Bridge (Russian River Crossing)		0.62		
Old Redwood Highway	10.80			
Mendocino Road	1.29			
Lewis Road	0.28			
Franklin Road	0.41			
North-Brookwood Roads	2.37			
Allan-Aston Way	0.75			
Petaluma Hill Road	6.79			
Old Adobe Road	11.87			
Petaluma Road	3.21			
Highway 116		1.61		
Highway 12/121		9.55		
Highway 12/29		4.00		
Highway 12		5.14		
North Kelly Road (Hwy 12 By-pass)		1.23		
Red Top Road	0.05			
Northern California Railroad Association			6.30	
Union Pacific Railroad			34.95	

Table 4B.XV-1. Right-of-Way Miles - Point Arena to Sacramento

Route Segment	Right-of-Way Miles			
	Local Roads	State Highways	Rail-road	Private Road
Yolo By-Pass, private lands				2.98
Stillwater Road	0.23			
Reed Avenue	0.54			
Sacramento Avenue	1.96			
3rd Avenue	0.09			
Sacramento River Crossing				0.37
Bercut Street	0.28			
Bannon Street	0.45			
North B Street	0.47			
Subtotal	81.23	47.45	52.13	3.35
GRAND TOTAL	184.165			

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* Approved in the previous proponent=s environmental assessment (California Public Utilities Commission 1999).

Regulations, Approvals, and Permits Applicable to Transportation/Traffic

The California Department of Transportation would require Williams to obtain an encroachment permit to perform construction activities within the state highway rights-of-way along the project route. In addition, some of the affected local agencies may require local encroachment permits or conditional use permits for activities within public road rights-of-way. Encroachment permit requirements vary by agency. The implementation of specific transportation and traffic measures may be required as conditions under the encroachment permits. Williams is currently identifying all of the required encroachment permits.

XVI. UTILITIES AND SERVICE SYSTEMS

Utilities are typically provided to development projects by a variety of local purveyors (e.g., city, county, special district, water agency, or school district). The services available vary depending on the level of development in the area. This project would not exceed wastewater treatment requirements of the RWQCB, require expansion of existing wastewater treatment facilities, or require construction of additional facilities. The project would not require the expansion of existing stormwater drainage facilities or the construction of additional facilities. The project would not require the use of any water, so it would not affect water resources. The project would not have an impact on landfill services. The project would comply with any applicable federal, state, and local statutes that pertain to solid waste. The only utility that the project would require is electrical power for the OP-AMP/regenerator stations. Therefore, no further discussion of the utilities and service systems setting is necessary.

ADig Alert@, AOne-Call@, or a similar underground utility contractor would be contacted to determine the locations of subsurface utilities before construction. All railroad companies would be notified of construction activities prior to construction. In areas where construction would occur along railroads, specific training may be required by railroad companies before any activities can occur within the respective rights-of-way. Such training would be completed as necessary.