5.4 Onshore Water Resources

The following sections summarize the environmental setting, project-related impacts, alternative projects' impacts, and cumulative impacts to onshore water resources, which include both surface and groundwaters in the area affected by the proposed project.

5.4.1 Environmental Setting

The environmental setting of the proposed project area, including the onshore water resources associated with existing facilities, is described in detail in the 1985 Point Pedernales EIR/EIS a (Arthur D. Little, 1985). Surface water and groundwater resources within the Santa Ynez River basin were described by Upson and Thomasson (1951) and Miller (1976), respectively, and onshore water resources in San Antonio Creek Valley and Santa Maria Valley were described by Muir (1964) and Worts (1951), respectively. Recent (ca. 1998-1999) information concerning the health of the Santa Ynez, San Antonio, and Santa Maria watersheds is listed on websites maintained by University of California, Davis and by the U.S. Environmental Protection Agency (EPA). Information from these sources concerning the environmental setting for surface waters and groundwaters is presented in the following sections.

5.4.1.1 Surface Waters

Wall/Surf Beach to LOGP

The onshore portion of the oil emulsion pipeline and the Lompoc Oil and Gas Plant (LOGP) processing facility are located in the Lompoc Subarea of the Santa Ynez River Basin in Santa Barbara County (SBC). The river and associated tributaries are the dominant surface water features within the project area. The river basin is situated between the east-west trending Santa Ynez Mountain and San Rafael Mountain ranges. The head of the basin occurs 60 miles east of the mouth of the Santa Ynez River within the Headwater Subarea of the river basin. Three dams in the upper reaches of the river are used for water supply for the South Coast of SBC.

The basin itself is a narrow, nearly flat, alluvial plain with a total area of approximately 800 square miles. Surface water drainages are limited to the distance between the crest of the mountain range and the shoreline. Therefore, most drainages are short, steep, and small. The major tributaries are Lompoc Canyon, La Salle Canyon, Sloans Canyon, San Miguelito Creek, and Salsipuedes Creek from the south, and Oak Canyon, Santa Lucia Canyon, Davis Creek, Purisima Canyon, and Cebada Canyon to the north. Throughout most of its length, the river is dry during most of the year, with large flows only in response to winter storms and spilling from upstream dams.

The Santa Ynez River basin is susceptible to severe flooding in response to heavy rainfall and water releases from upstream dams. Peak flows may reach 100,000 cubic feet per second (cfs). Flooding has potential for substantial soil erosion within the flood plain.

Within the project area, rainfall typically occurs only during November through April, with high annual variability. The average rainfall at Lompoc is approximately 23 inches, with a range of approximately 6 to 30 inches per year. In response to seasonal rainfall, stream flow and the presence of surface waters are also highly variable throughout most of the basin. In contrast,

perennial flow exists near the mouth of the Santa Ynez River and other areas subject to groundwater discharge, irrigation runoff, and effluent discharge from the Lompoc Regional Wastewater Treatment Plant. Flow volumes and water quality characteristics within the river basin are highly variable.

Surface water quality in the project area is typical of surface waters in the river basin. No major industrial waste sources discharge directly to the Santa Ynez River. In accordance with a National Pollutant Discharge Elimination System (NPDES) permit, the Lompoc Wastewater Treatment Plant discharges approximately 5 million gallons per day (MGD) of treated municipal wastewaters at a location approximately three miles from the river mouth. Water quality in the river has been characterized as "less serious problems-low vulnerability" (i.e., to stressors such as pollutant loadings above permitted discharge limits and urban runoff potential; EPA, 1999). However, the Santa Ynez River is on the 2002 Section 303(d) list as an impaired water body. Nutrients, sedimentation/siltation, and salinity/ total dissolved solids (TDS)/chlorides are parameters of concern. Major ions include sodium, chloride, bicarbonate, and sulfate. Waters are suitable for most irrigation and agricultural uses but only marginally suitable for domestic uses because of high TDS levels.

The onshore portion of the pipeline is north of and generally parallel to the Santa Ynez River before turning north near Valve Site #6. From landfall to Route 1, the pipeline crosses 14 drainages, with drainage areas ranging from 18 to 9,100 acres. All but two are considered minor, with drainage areas less than 200 acres. Surface waters in these minor drainage areas are classified as ephemeral (i.e., seasonal), and natural runoff occurs only during the rainy season.

Surface waters in the western end of the land portion of the pipeline near the mouth of the Santa Ynez River are fed by groundwater, irrigation tail water, and effluent from the Lompoc Wastewater Treatment Plant. During portions of the year (e.g., summer), the presence of a sand bar at the mouth of the river prevents exchange between the river and ocean. Following winter storms, high river flows will breach and erode the sand bar, allowing the river to drain to the ocean. While the river mouth is open, exchanges with ocean waters result in increases in salinity within portions of the rivers affected by estuarine circulation (e.g., mixing of lower density river water and higher density seawater).

A small water body is also located immediately north of the mouth of the river, between the back dunes of the beach and the railroad tracks. This water body appears to be part of the estuarine system within the lower Santa Ynez River, although exchange between this water body and the river probably occurs episodically due to formation of a sand berm at the connection to the river mouth. Based on the species of vegetation present, waters within this feature are expected to be brackish. The onshore portion of the pipeline passes within 0.5 kilometers of this portion of the estuary.

Proceeding inland from the railroad tracks, the pipeline route between Catchment Basins #2 and #8 is one kilometer or more from the Santa Ynez River. The direction of surface water flow in the area of the pipeline route is generally southwestward, towards the river. The pipeline crosses a small drainage near Catchment Basin #4, where the pipeline daylights and is suspended at an elevation of approximately 50 feet over the floor of the canyon (see Figure 5.4-1).

According to the 1985 Point Pedernales EIR/EIS, this unnamed canyon drains an area of 213 acres, with an average flow of 15.4 acre-feet per year (AFY), although streamflow is classified as ephemeral (HDR, 1984). Eight catchment basins, with varying capacities, have been constructed along the portion of the pipeline between Valve Site #1 (at the beach landing) and Valve Site #5 (Figure 5.4-2).

Between Catchment Basins #8 and #12, the pipeline route is within approximately 0.5 kilometers of the Santa Ynez River. The pipeline also crosses Oak Canyon near Basin 12 before turning north and away from the river. Oak Canyon and related tributaries drain an area of approximately 1800 acres with an average flow of 70 acre-feet per year (Arthur D. Little, 1985). Streamflow in Oak Canyon is classified as ephemeral, and has been diverted into a diked channel along the eastern side of the valley floor (HDR, 1984).

Near Valve Site #8, the pipeline route crosses Santa Lucia Canyon, which drains an area of approximately 9,000 acres and has an average flow of 373 acre-feet per year. The stream is classified as intermittent/perennial. Santa Lucia Canyon drains to the Santa Ynez River. Approximately mid-way between Valve Sites #8 and 9, the pipeline route passes within one kilometer of a wetlands area classified as an ephemeral stream (HDR, 1984) with a small (less than 30 acres) drainage area. From Valve Site #9 to the Lompoc Oil and Gas Plant, the pipeline crosses a number of small drainages with ephemeral flow, and Davis Creek, with a drainage area of 3,660 acres and intermittent/perennial flow from underground return flow of golf course irrigation water (HDR, 1984). No catchment basins occur along this portion of the pipeline route.

No specific data are available to characterize water quality within these smaller drainage systems. Large portions of the Oak Canyon and Santa Lucia Canyon drainage areas are undeveloped without significant sources of industrial discharges or agricultural or urban runoff. Portions of the Davis Creek drainage area could be affected to a relatively greater extent by urban runoff and, therefore, surface water quality may reflect inputs of nutrients, bacteria, pesticides, and organophosphorus herbicides that are common in urbanized watersheds.

LOGP to Suey Junction

The oil pipeline corridor from LOGP to Suey Junction crosses 26 drainages within the San Antonio and Santa Maria watersheds. San Antonio Creek Valley drains a 154 square mile area, and includes drainages associated with Purisima Hills, San Antonio Creek, Harris Canyon, Long Canyon, and Graciosa Canyon consisting primarily of agricultural uses and urban riparian habitat. Most of these drainages are small and ephemeral or intermittent, and they are affected primarily by seasonal precipitation events. Annual average rainfall in this area is approximately 15 inches. San Antonio Creek is on the 2002 Section 303(d) list as an impaired water body. Boron and sedimentation/siltation are parameters of concern. No other specific water quality data are available for these drainages; however, many are likely affected by runoff from adjacent agricultural operations.

Suey Junction to Summit Pump Station

Onshore water resources associated with the ConocoPhillips pipeline between Suey Junction and Summit Pump Station are described briefly below; additional information is provided in the Sisquoc Pipeline SEIR (Arthur D. Little and SAIC, 2000). The pipeline crosses two drainage

basins between the Suey Junction and the Summit Pumping Station. Nearly 95 percent of the pipeline runs through the Santa Maria River Basin, while the remaining 5 percent lies in the Central Coastal Basin.

The Santa Maria River drainage basin is dominated by a broad alluvial plain and extends from northern SBC to southern San Luis Obispo County. The Santa Maria River originates in the foothills of the San Rafael Mountains at the junction of the Cuyama River and the Sisquoc River. It continues west along the northern boundary of Santa Maria, past the town of Guadalupe, through a coastal estuary, and into the Pacific Ocean. Large areas along the river valleys are irrigated cropland, while surrounding hills are used for rangeland.

The drainage area at Guadalupe is approximately 1,700 square miles. Based on USGS data from 1941 to 1987, average flow on the Santa Maria River at Guadalupe is approximately 30 cfs. Highest flows are in March, which averages 137 cfs. Summer flows are minimal. The August average is near zero. The Santa Maria River is capable of high flows, with three instances of discharges above 20,000 cubic feet per second at Guadalupe since 1959 (USGS, 2006).

Water quality and water supply are major concerns within the watershed. Erosion and nutrient loadings are important issues. Water quality in the Santa Maria River basin reflects the influences of local topography and land use. The Santa Maria River is on the 2002 Section 303(d) list as an impaired water body. Fecal coliform and nitrate are parameters of concern.

Water quality in the mountainous areas of the basin is generally high because of its low dissolved mineral content. Surface flows are diverted for domestic use, irrigation, and for percolation and recharge of groundwater basins. Beneficial uses for the Santa Maria River include: municipal and domestic supply, agricultural supply, industrial service supply, groundwater recharge, freshwater replenishment, recreation, commercial and sport fishing, warm and cold fresh water habitat, terrestrial wildlife habitat, migration of aquatic species, and habitat that supports rare, threatened, or endangered species (Regional Water Quality Control Board (RWQCB, 1994).

The pipeline crosses Nipomo Creek twice and runs parallel to it for much of its route, crossing 14 minor drainages that empty into the Nipomo Creek. Nipomo Creek begins in the hills north of Santa Maria near the Nipomo Mesa and flows into the Santa Maria River. Nipomo Creek is on the 2002 Section 303(d) list as an impaired water body. Fecal coliform is the parameter of concern. Although the RWQCB has not designated specific beneficial uses, the Creek is assigned the designations of municipal and domestic water supply as well as protection of both recreation and aquatic life (RWQCB, 1994).

Only five percent of the pipeline route lies in the Central Coastal Drainage Basin, which extends north to Carmel in Monterey County. This section of pipeline approaches but does not cross the Los Berros Creek near the Summit Pump Station. It does, however, cross a drainage approximately 1,500 feet from the creek. The Los Berros Creek is the southernmost waterway in the Central Coastal Basin. Near the Summit Pump Station, the Los Berros Creek meanders along the edge of agricultural land, passes through the Pismo Dunes Natural Preserve, and empties into the Pacific Ocean. Beneficial uses for the Central Coastal drainage include: municipal and domestic supply, agricultural supply, groundwater recharge, recreation, commercial and sport fishing, warm and cold fresh water habitat, terrestrial wildlife habitat, migration of aquatic species, and habitat that supports rare, threatened, or endangered species (RWQCB, 1994).

The Los Berros Creek has historical peak flow of 691 cubic feet per second, a historic annual average flow of 1.3 cubic feet per second, and a historic rainy season (November through April) average flow of 2.7 cubic feet per second (USGS, 2000; County of San Luis Obispo, 1968-1998).

5.4.1.2 Groundwater

Surf Beach to LOGP

Portions of the proposed project are located within the Lompoc Subarea of the Santa Ynez River basin. The geological units of the basin can be divided into two parts: underlying, non-water bearing, consolidated rocks, and an overlying, water bearing, unconsolidated deposit. The underlying consolidated rocks form an effective lower boundary for the usable aquifer.

The lower portion of the younger alluvium under the Lompoc Plain is up to 180 feet thick, comprises most of the water-bearing zone, and is the most utilized aquifer in the Lompoc area (Miller, 1976). The upper portion of the alluvium has a lower permeability, but supplies a few domestic wells, whereas the river channel deposits are permeable but not tapped by wells in the Lompoc Plain. The lower terrace deposits that underlie alluvium deposits on the southern portion of the plain are up to several thousand feet thick, moderately permeable, and tapped by many wells with yields up to several hundred gallons per minute (Miller, 1976).

The aquifer of the Santa Ynez River Basin is bounded below and laterally to the north, south, and east by largely impermeable consolidated formations, and on the west by the ocean. These conditions create a general flow direction from east to west, with unconsumed groundwater discharging to the ocean. Prior to reaching the ocean, the aquifers discharge to streams where the water level in the stream is lower than the adjacent water table. Aquifer recharge is from infiltration of rainwater, seepage from streams, and return flows from irrigation and wastewater discharges (Arthur D. Little, 1985).

Depth to groundwater varies from zero near the ocean to over 400 feet in upland areas of the basin. For much of the Lompoc Plain, depth to groundwater ranges from 15 to 50 feet. Seepage from the Santa Ynez River to groundwater occurs consistently in portions of the river downstream from the city of Lompoc and intermittently in the rest of the river. Average annual recharge to groundwater in the Lompoc Plain from the Santa Ynez River, local tributaries, rain infiltration, and underflow is approximately 14,000 acre-feet, whereas removal is due to pumping, evapotransporation, streamflow, and underflow to the ocean. The net consumptive use from the Lompoc Basin was estimated to be 22,459 acre-feet in 2000 (SBC, 2001a).

Groundwater within the Lompoc Subarea is used extensively for agriculture (an estimated 70 percent), as well as some municipal, industrial, and military requirements. In contrast, groundwaters generally are not suitable for drinking water due to high TDS, as well as sulfate, chloride, and iron concentrations. Previous studies had shown a progressive deterioration of groundwater quality within the Santa Ynez River Basin, associated with increasing chloride ion concentrations due to agricultural recycling (Evenson, 1965). The effects of saltwater intrusion in the western portion of the basin are considered negligible.

The project area lies in the Lompoc Groundwater Basin, which consists of three hydrologically connected sub-basins: Lompoc Plain, Lompoc Terrace, and Lompoc Uplands. These basins,

specifically Lompoc Plain and Lompoc Upland, are in equilibrium as natural recharge is augmented with periodical water releases from Cachuma Reservoir (Santa Barbara County Public Works, 2006).

LOGP to Suey Junction

Groundwater resources between the LOGP and Orcutt Pump Station are described in Arthur D. Little (1985). Groundwaters in the San Antonio basin are pumped for agricultural as well as some municipal and industrial uses. Depth to groundwater along the pipeline typically ranges from 20 to greater than 100 feet. Therefore, San Antonio Creek is generally above the water table, except at Barka Slough. Surface water bodies, when present, may recharge the groundwater. Groundwater quality in the San Antonio groundwater basin is similar to that of the Santa Ynez River basin, and is characterized by high TDS concentrations.

Suey Junction to Summit Pump Station

Groundwater in the Santa Maria River basin is used heavily for agriculture and, until 1997, as municipal water supply for the City of Santa Maria. Since 1997 and for the foreseeable future, the City of Santa Maria will rely on State Water for 100 percent of its municipal supply while groundwater will be used to flush lines and remain an emergency backup supply. Surface waters recharge groundwater, except in the western portion of the basin where impermeable beds underlie the river. Due to inadequate recharge, water shortages occur during the dry season, even during years of average rainfall. Groundwater quality in the Santa Maria groundwater basin is similar to that of the Santa Ynez River basin and is characterized by high TDS concentrations.

5.4.2 Regulatory Setting

Federal

Clean Water Act. The Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq., formerly the Federal Water Pollution Control Act of 1972 was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCB).

Projects that disturb one or more acres are required to obtain NPDES coverage under the California General Permit for Discharges of Storm Water Associated with Construction Activity. The Construction General Permits require the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) describing Best Management Practices (BMPs) to be used during construction to protect storm water runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredge or fill material to the waters of the U.S. and adjacent wetlands. The limits of

nontidal waters extend to the Ordinary High Water (OHW) line, defined as the line on the shore established by the fluctuation of water and indicated by physical characteristics, such as natural line impressed on the bank, changes in the character of the soil, presence of debris. The USACE issues individual site-specific or general (Nationwide) permits for such discharges. A Section 404 permit would likely be required for the proposed project construction.

Section 401 of the CWA requires that any activity, including river or stream crossings during road, pipeline, or transmission line construction, which may result in a discharge into a State waterbody must be certified by the RWQCB. This certification, usually triggered by the need for a 404 Permit, ensures that the proposed activity not violate State and/or federal water quality standards.

Section 303(d) of the federal Clean Water Act (CWA, 33 USC 1250, et seq., at 1313(d)), requires States to identify waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). States are required to compile this information in a list and submit the list to USEPA for review and approval. This list is known as the Section 303(d) list of impaired waters. As part of this listing process, States are required to prioritize waters/watersheds for future development of Total Maximum Daily Loads (TMDLs). A TMDL is a written plan that describes how an impaired waterbody will meet water quality standards (www.swrcb.ca.gov/tmdl/docs/tmdl_factsheet.pdf). The State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCB) have ongoing efforts to monitor and assess water quality, to prepare the Section 303(d) list, and to subsequently develop TMDLs.

State

California Streambed Alteration Agreement. Section 1601 of the California Fish and Game Code requires an agreement between the Department of Fish and Game and a public agency proposing to substantially divert or obstruct the natural flow or effect changes to the bed, channel, or bank of any river, stream, or lake. The agreement is designed to protect the fish and wildlife values of a river, lake, or stream.

California Porter Cologne Water Quality Control Act. The Porter Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The Porter Cologne Water Quality Control Act also regulates the discharge of pollutants or dredging and filling into the waters of the United States, which includes wetlands.

Section 1601 of the California Fish and Game Code requires an agreement between the Department of Fish and Game and a public agency proposing to substantially divert or obstruct the natural flow or effect changes to the bed, channel, or bank of any river, stream, or lake. The agreement is designed to protect the fish and wildlife values of a river, lake, or stream.

The California Coastal Act addresses several issues that relate to surface waters. Specific sections of the Act, addressing flood hazards and disturbances, maintenance of biological productivity, and possible impacts from runoff, could be applicable to the proposed project.

These include Section 30233 (diking, filling, or dredging of open coastal waters); Section 30231 (biological productivity); and Section 30240 (environmentally sensitive habitat areas).

Onshore re-injection of produced waters requires approval from the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) under provisions of the Public Resources Code and a permit reviewed by RWQCB.

Regulations covering oil spills are discussed in Section 5.1, Risk of Upset.

Regional and Local

Most counties in California have floodplain and drainage regulations that regulate floodplain development. These regulations generally prohibit floodplain development that will result in flooding of the development, and prohibit floodplain development that will result in adverse flooding impacts on other property. For instance, floodplain encroachments that raise water levels on other property are generally prohibited, as are diversions and concentrations of flow.

Policies adopted by SBC address siting criteria for new structures, including avoidance of geological hazards and locations overlying regional groundwater basins (County of Santa Barbara, 2000).

5.4.3 Significance Criteria

Significant impacts to onshore water resources would result from any of the following events or conditions:

- Violation of any water quality standards or waste discharge requirements;
- Substantial depletion of groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantial alteration of the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water exceeding the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Other substantial degradation of water quality in surface water such as streams, lakes, ponds and wetlands, and groundwater
- Location of facilities in flood-prone area or alterations to the course or flow of floodwater;
- Substantial flooding, erosion, or siltation; and/or
- Alteration of stream flow characteristics that result in erosion, sedimentation or flooding downstream.

The above criteria are based on CEQA significance criteria. These criteria cover the Santa Barbara significance criteria for water quality, listed below, as they are applicable to the proposed project.

According to Santa Barbara County ~~Significance~~Environmental Thresholds and Guidelines Manual, a significant water quality impact is presumed to occur if the project:

- Is located within an urbanized area of the county and the project construction or redevelopment individually or as a part of a larger common plan of development or sale would disturb one (1) or more acres of land;
- Increases the amount of impervious surfaces on a site by 25% or more;
- Results in channelization or relocation of a natural drainage channel;
- Results in removal or reduction of riparian vegetation or other vegetation (excluding non-native vegetation removed for restoration projects) from the buffer zone of any streams, creeks or wetlands;
- Is an industrial facility that falls under one or more of categories of industrial activity regulated under the NPDES Phase I industrial storm water regulations (facilities with effluent limitation; manufacturing; mineral, metal, oil and gas, hazardous waste, treatment or disposal facilities; landfills; recycling facilities; steam electric plants; transportation facilities; treatment works; and light industrial activity);
- Discharges pollutants that exceed the water quality standards set forth in the applicable NPDES permit, the Regional Water Quality Control Board's (RWQCB) Basin Plan or otherwise impairs the beneficial uses of a receiving waterbody; or
- Results in a discharge of pollutants into an "impaired" waterbody that has been designated as such by the State Water Resources Control Board or the RWQCB under Section 303 (d) of the Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act).
- Results in a discharge of pollutants of concern to a receiving water body, as identified ~~in~~by the RWQCB.

5.4.4 Impact Analysis for the Proposed Project

The following sections discuss potential impacts to onshore water resources, mitigation measures (where appropriate), and residual impacts associated with the proposed project. Because the proposed project largely would use existing facilities (e.g., LOGP and pipelines), requirements for new facilities or equipment with potentials for impacting onshore water resources are minimal. Impacts from the existing Point Pedernales facilities and operations are discussed in the 1985 Point Pedernales EIR/EIS. Impacts associated with the proposed project are related to changes in the present facilities or operating conditions, and are described below.

Impact #	Impact Description	Phase	Residual Impact
OWR.1	Project-related construction could cause erosion or siltation resulting in substantial degradation of surface water quality.	*Construction*	*Class II*

The proposed project may require~~s~~ new construction activities related to the installation of pumps and associated equipment at Valve Site #2 and the installation of power poles and a substation to connect the pumps to the existing power lines along Ocean Avenue. These construction activities have the potential for disturbances to existing soil conditions, changes in local surface water flow patterns, or surface water impoundment and increased siltation of drainages and the Santa Ynez River. Construction activities associated with Valve Site #2 would

occur within the disturbed site and no additional vegetation removal would be required. Vegetation removal associated with the proposed project is limited to power line installation. Assuming 45 power poles total, the disturbance would be approximately 0.33 acre of vegetation and wildlife habitat. Construction of the proposed transformer station would result in temporary impacts to 4,200 square feet and permanent loss of 150 square feet of vegetation or wildlife habitat (depending on location), for a total of less than 0.1 acre of impact. Installation of power poles immediately adjacent to the Santa Ynez River could cause run-off into the river from excavated or disturbed areas or soil storage piles associated with pole installation. These impacts would be considered potentially significant.

Mitigation Measures

Mitigation Measures OWR-1, GR-1, AG-6, AG-7, TB-18 and TB-22 would reduce the magnitude of potential impacts to onshore water quality associated with disturbances to soils and vegetation during construction.

OWR-1 Prepare a Stormwater Pollution Prevention Plan (SWPPP) that describes Best Management Practices (BMPs) to be implemented for the purpose of minimizing soil loss and other construction-related sources of water pollution for any new construction associated with the project. The SWPPP will be prepared in accordance with RWQCB guidelines and will designate BMPs that will be followed during construction activities. Erosion-minimizing efforts may include measures such as avoiding excessive disturbance of steep slopes; using drainage control structures (e.g., coir rolls or silt fences) to direct surface runoff away from disturbed areas; strictly controlling soil stockpiling and vehicular traffic; implementing a dust-control program during construction; restricting access to sensitive areas; using vehicle mats in wet areas; and revegetating disturbed areas following construction. Erosion-control measures will be installed before extensive clearing and grading begins, and before the onset of winter rains. The SWPPP BMPs shall specify that the staging of construction materials, equipment, and excavation spoils, and refueling of equipment will be performed at least 100 feet outside of drainage channels and intermittent streams, where these receive overland runoff. Mulching, seeding, or other suitable stabilization measures will be used to protect exposed areas during and after construction activities. If required, concrete washout stations will be established to avoid direct release to surface water or to areas where groundwater could become contaminated. The SWPPP shall be submitted to SBC/CCC for review and approval prior to construction.

Residual Impact

With the implementation of the erosion and siltation mitigation measures, the residual impact is considered to be *significant but mitigable (Class II).*

Impact #	Impact Description	Phase	Residual Impact
OWR.2	A rupture or leak from the emulsion, produced water or dry oil pipelines could substantially degrade surface and groundwater quality.	*Increased Throughput Extension of Life*	*Class I*

A spill or large leak of crude oil or oil emulsion could allow either emulsion or dry oil to be released into the environment, which could substantially degrade surface and groundwater quality in nearby drainages and streams or rivers. Because the potential for spills already exists within the project area, the possible significance of a spill to onshore water resources associated with the proposed project is related to the incremental change in the size of the spill event. Small leaks or spills, which are contained and cleaned up quickly, may have minor or negligible impacts to onshore water resources. In contrast, large spills, or pipeline ruptures, which spread to surface waters and/or groundwater may substantially degrade water quality, with potential long-term impacts to beneficial uses and biological resources. Since the potential impacts to water resources associated with the baseline conditions are considered locally and regionally significant (Arthur D. Little, 1985), an increase in spill size would increase the severity of an already significant impact. In addition, the proposed project increases the lifetime probability of leaks or spills. Therefore, the impacts associated with the proposed project are considered significant.

Each of the oil emulsion, produced water, and gas pipelines from Platform Irene to LOGP, and the crude oil pipeline from LOGP to Summit Junction, has the potential to rupture or leak. Gas leaks would have negligible impacts to water resources because leaked materials would volatilize and, therefore, not directly affect surface or groundwater. In contrast, both produced water and oil emulsion spills could affect surface and groundwaters depending on the location and size of the spill. Although the proposed project would treat produced water to achieve compliance with offshore receiving water criteria in accordance with the National Pollutant Discharge Elimination System (NPDES) permit, onshore spills still may contain some soluble hydrocarbons with the potential for affecting surface and/or groundwater quality. Under worst-case conditions, maximum estimated spill volumes of oil or oil/water emulsion would be lost from a pipeline rupture immediately adjacent to surface waters at a location with no containment basins to impede oil dispersion. Although some of the more toxic components of oil would be lost rapidly due to weathering (e.g., volatilization), spills reaching the Santa Ynez River could have significant, long-term and widespread impacts to water quality and, consequently, sensitive biological resources. Similarly, subsurface (i.e., underground) spills, or surface spills in areas with porous surface soils and a shallow aquifer, could result in significant, long-term contamination of groundwater.

Increased throughput of oil emulsion, produced water, and crude oil would increase the maximum potential spill volumes. Further, the oil content of the emulsion would increase from present levels of 12~~10~~ percent to approximately 40~~34~~ percent. Consequently, the total mass of oil released by an oil emulsion spill would be greater than under existing conditions.

The total physical capacity of the emulsion pipeline between Platform Irene and the LOGP is 46,000 barrels. However, due to the onshore terrain (and pipeline path), and the series of existing check valves in the pipeline, only a portion of the total pipeline volume would be lost in the event of a spill. The specific volume would depend on the time between leak occurrence and

system shutdown and the pumping rate. Maximum possible spill volumes for different pipe segments are presented in Section 5.1, Risk of Upset.

At Valve Site #2, the worst-case emulsion spill volume is 2,054 barrels. As mentioned previously, the probability of a rupture at this location would increase to 8.9 percent over the life of the project. (The probability of leaks from pumps would approach 100 percent due to potential failure of the new pumps, although leaks would not likely affect onshore water resources.) Surface water resources at this location would also be vulnerable for three reasons. Valve Site #2 does not have an adjacent catchment basin, the facility is within one kilometer directly upslope from the lower portion of the Santa Ynez River, and oil emulsion spilled at this location could flow directly along, and on top of, the road to the river without substantial impediment by local terrain or sorption by surface soils.

Oil from a surface spill would disperse and weather. Weathering would, in turn, affect the long-term persistence and toxicity of oil. The oil emulsion would have a lower viscosity than crude oil, which would increase the potential for transport in surface flows (e.g., runoff) or movement towards and with groundwaters. On the other hand, the soluble and more toxic components of crude oil (e.g., benzenes and other lower molecular weight aromatic compounds) would be lost more readily due to volatilization from an emulsion than from crude oil. Consequently, the toxicity of a potential spill may be reduced somewhat by natural weathering processes during dispersion. In contrast, insoluble oil fractions retained in low energy aquatic environments, due to burial in bottom sediments or trapped by aquatic vegetation, can affect water quality for periods up to several years. The possible dispersion and fate of a subsurface (underground) spill would be different and would depend in part on soil permeability and depth to groundwater. In most areas along the pipeline, groundwater occurs at depths greater than 75 feet below ground surface (U.S.G.S., unpublished data); therefore, an oil spill would not immediately contact groundwater. However, in some areas where the water table is shallow and soil is permeable (i.e., at the coastline), oil or produced water spills could affect groundwater.

In the event of a spill, containment facilities and cleanup procedures can reduce the potential impacts of the spill to onshore water resources. The success of the cleanup effort in preventing or minimizing impacts of the spill would depend on the volume and location of the spill, and the time needed to initiate the response action. A number of facilities, spill prevention methods, and response plans presently exist to minimize impacts from spills. These include: containment basins constructed along the pipeline route to retain and/or retard dispersion of spills; spill prevention and cleanup plans with regular preparedness reviews; monitoring, including regular pipe pigging to detect areas of significant corrosion within the pipeline; and automated leak detection and valving systems (e.g., SCADA - Supervisory Control and Data Acquisition) capable of detecting appreciable fluid losses from the pipeline and isolating specific pipeline sections in the event of spill to minimize spill volumes. The existing catchment basins along the onshore portion of the pipeline adjacent to the Santa Ynez River (see Figure 5.4-2) would be used to retain and prevent dispersion of the spill.

PXP has prepared an Oil Spill Response Plan which includes a Groundwater Protection Plan. This plan calls for regular monitoring for leaks, subsurface investigation to assess the extent of contamination, and preparation of leak-specific remedial action plans (excavation and disposal, in-situ treatment, etc.). In the event that leaks reach the groundwater table, owners of wells that could potentially be affected will be notified, and remedial action plans developed. Since known

existing irrigation and water supply wells in the down-gradient sensitive areas pump from below the water table surface, it is unlikely that water supply from these would be adversely affected. Should this occur, however, the groundwater protection plan calls for backup water supplies, reconditioning the contaminated well, or installation of a new well.

The corrosion program for the 8-inch produced water return pipeline is summarized in Table 5.1.2c~~a~~. The water pipeline has not experienced any leaks or failures to date.

There are no anticipated changes to the corrosion control program, however, the frequency of the maintenance pigging may increase or decrease based on pipeline parameters. If, for example, the pipeline smart pigging demonstrates increased corrosion rates, then pigging would occur more frequently. A recent Smart Pig Survey (2005) showed evidence of corrosion. A section of pipe has been repaired and as a result of a confirmation dig for the identified anomalies, a monolithic isolation flange and pipe spool were replaced in 2005 at valve site #1. The internal corrosion survey conducted in 2005 using a high resolution pig showed 21 anomalies between 30 and 60 percent of wall thickness; the majority of anomalies (>99 percent) were between 10 and 29 percent of wall thickness.

Mitigation Measures

In addition to Mitigation Measure Risk-1, the following mitigation measures are proposed.

OWR-2 The applicant shall construct a berm around Valve Site #2 with sufficient capacity to retain 150 percent of the maximum spill volume associated with this portion of the onshore pipeline (see Section 5.1, Risk of Upset). The applicant shall submit specific plans for the catchment basin at Valve Site #2 to SBC/CCC for review and approval prior to land use clearance. The berm shall be installed prior to operations.

OWR-3 Update the Oil Spill Contingency Plan and the November 2004 Oil Spill Response Plan and July 2005 Supplement to address the SCADA system and GR.1-related requirements for the proposed project. Conduct annual readiness exercises and audits to ensure that containment and cleanup equipment is readily available close to areas with greatest vulnerability to spills (e.g., along the lower sections of the Santa Ynez River).

OWR-4 PXP shall ensure that catchment basins located along the Santa Ynez River section of the pipeline are cleaned and surveyed periodically to ensure that they are capable of holding at least 110 percent of the associated release volume from nearby pipeline segments. Prior to land use clearance, PXP shall provide volume calculations to SBC for each of the catchment basins for the following leak scenarios: (1) 11 minutes of pumping time for a worst case leak in accordance with the MMS Oil Spill Response Plan, Volume 2, worst case scenario, and (2) 20 minutes of pumping time for a small leak as detected by the PXP leak detection system. The total pipeline emulsion fluids, including produced water, shall be included in the calculations. If it is determined that the volume of any of the catchment basins is insufficient to fully contain the leak scenarios analyzed, the catchment basin(s) shall be expanded. Plans for catchment basin(s) expansion shall be submitted to SBC for review and approval prior to land use clearance.

OWR-5 Ensure that any pipeline replacement within stream beds is engineered such that the replacement pipeline and any pipeline support structures are protected from scour and erosion effects of a 100-year flood discharge. Plans demonstrating these requirements shall be submitted to SBC/CCC for review and approval prior to land use clearance.

Residual Impact

These mitigation measures, in combination with the mitigation measures listed in Section 5.1, Risk of Upset, Section 5.2, Terrestrial Biology, and Section 5.3, Geological Resources, would reduce the severity of potential spill impacts to onshore water resources. However, even with implementation of these mitigation measures, the potential for impacts to surface water and groundwater resources from oil emulsion or dry oil spills would remain *significant (Class I)*.

Impact #	Impact Description	Phase	Residual Impact
OWR.3	Continued monitoring and pipeline maintenance and replacement activities associated with the onshore pipeline system could cause disturbances to soils that could cause erosion and subsequent siltation resulting in degradation of surface water quality.	*Extension of Life*	*Class II*

Extending the life of the facility would extend the risk of ground disturbances that could occur due to pipeline maintenance and repair activities. These ground disturbances could result in erosion, and siltation of nearby drainages and surface water bodies. These would be due primarily to the required excavation and replacement of pipeline segments. These activities are associated with the current operations. However, the extension of life of the facilities due to the Tranquillon Ridge Project would extend the potential for these types of disturbances. This issue is also discussed in Sections 5.2 (Terrestrial Biology) and 5.3 (Geological Resources). These impacts would be considered significant.

Mitigation Measures

Implementation of Mitigation Measure OWR-1 and GR-1 would reduce potentials for causing significant erosion or siltation associated with excavation along the pipeline right-of-way, along with the following measure:

OWR-6 If soil excavation is needed to expose buried pipeline or cleanup a spill within a stream bed, the area shall be restored to the maximum extent feasible to pre-spill conditions after excavation is completed.

Residual Impact

With implementation of Mitigation Measures OWR-1, OWR-6, and GR-1 the residual impact would be *significant but mitigable (Class II).*

Impact #	Impact Description	Phase	Residual Impact
OWR.4	Remediation activities associated with a pipeline spill could increase erosion and siltation and substantially degrade surface water quality.	*Increased throughput Extension of Life*	*Class II*

Remediation activities related to a release from the emulsion, produced water or dry oil pipelines would involve the mobilization of equipment, booms, and might also involve the construction of berms, modification of drainage or steam/river terrain and the travel of construction equipment off road. These activities could result in erosion and siltation of nearby drainages and surface water bodies as well as permanent changes to drainage and stream/river bed characteristics, which could adversely impact surface water quality. These activities are associated with the current operations and are considered to be potentially significant. With the increased throughput associated with the Tranquillon Ridge Project, these potential significant impacts would increase in severity. In addition, the extension of life of the facilities due to the Tranquillon Ridge Project would extend the potential for these types of disturbances. This issue is also discussed in Sections 5.2 (Terrestrial Biology) and 5.3 (Geological Resources). These impacts would be considered significant.

Mitigation Measures

Implementation of Mitigation Measures OWR-1, GR-1 and OWR-6 would reduce the potential for causing significant erosion or siltation associated with spill remediation activities along the pipeline right-of-way.

Residual Impacts

The residual impact is expected to be *significant but mitigable (Class II).*

Impact #	Impact Description	Phase	Residual Impact
OWR.5	Increased water injection rates could potentially infiltrate fresh water aquifers.	*Extension of Life*	*Class III*

Increased throughput of crude oil could increase the volume of produced water disposal via onshore injection, which could infiltrate fresh water aquifers. Produced water would be separated from the crude oil at the LOGP and transported to Platform Irene and/or the onshore Lompoc Oil Field and injected into existing designated disposal wells. An increase in produced water could potentially exceed the safe capacity of each onshore injection well. This scenario could allow produced water to infiltrate fresh water aquifers, which would contaminate them with non-potable water.

To increase groundwater protection, the Safe Drinking Water Act (SDWA) of 1974 established a federal Underground Injection Control (UIC) program, which established minimum requirements for effective state UIC programs. Because ground water is a major source of drinking water in the United States, the UIC program requirements were designed to prevent contamination of Underground Sources of Drinking Water (USDW) resulting from the operation of injection wells. A USDW is defined as an “aquifer or its portion which supplies any public water system, or contains less that 10,000 milligrams per liter total dissolved solids and is not an exempt aquifer” (Groundwater Protection Council).

In California, all Class II injection wells are regulated by DOGGR, under provisions of the state Public Resources Code and the federal Safe Drinking Water Act. Class II injection wells fall under the Division's Underground Injection Control (UIC) program, which is monitored and audited by the U.S. Environmental Protection Agency. The Division received EPA primary authority "primacy" for regulation of Class II wells in 1983. The main features of the UIC program include permitting, inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, and public outreach. In California, Class II injection wells have an outstanding record for environmental protection. A peer review conducted by a national organization, the Ground Water Protection Council, found that the division has an excellent program that effectively protects underground sources of drinking water (Ground Water Protection Council, 2000).

The DOGGR is the state agency responsible for approving injection wells within the state of California. The DOGGR imposes well construction, monitoring, testing, and operational requirements that make it unlikely that fresh water aquifers would be affected from the injection of produced water.

Mitigation Measures

No mitigation measures are proposed because of existing regulatory oversight of injection wells.

Residual Impact

Impact OWR.5 associated with injection of produced water into the Lompoc Oil Field would be *adverse but not significant (Class III).*

Impact #	Impact Description	Phase	Residual Impact
OWR.6	~~Continued use of groundwater by LOGP~~The project could contribute or lead to groundwater basin ~~an~~ overdraft~~condition~~.	*Extension of Life*	*Class III*

The proposed project would extend LOGP's contribution to withdrawals from the Lompoc groundwater basin over the longer life of the project. Continued operation of LOGP beyond its current permitted life would continue the consumption of this resource. However, the groundwater basin is not currently in an overdraft condition. Further, the LOGP annual usage is comparable to a small office building according to their water supplier (MHCSD, 2002), represents only a small fraction of overall consumption, and is less than SBC's threshold of significance for extractions from the Lompoc Basin. Therefore, the impact would be considered less than significant.

Mitigation Measures

No mitigation measures have been proposed because of the nominal contribution of the LOGP.

Residual Impact

The impact from the proposed project would be minimal; therefore, it is considered *adverse but not significant (Class III).*

5.4.5 Impact Analysis for the Alternatives

Detailed descriptions of the various alternatives have been provided in Chapter 3.0. This section provides a discussion of the onshore water resource impacts of the various alternatives.

5.4.5.1 No Project Alternative

Scenarios 2 and 3. As discussed in Section 3.2, under the No Project Alternative Scenarios 2 and 3, production of the federal portion of the Tranquillon Ridge field would and would not occur, respectively. However, no extension of life of Point Pedernales facilities (Platform Irene, pipelines, and LOGP) is assumed under either scenario.

Impact OWR.1 - Construction Related Impacts: Construction of the power line and installation of the pumps at Valve Site #2 would not occur under either Scenario 2 or 3 ~~the No Project Alternative~~. Therefore, this impact would not occur.

Impact OWR.2 - Spill Related Impacts, OWR.4 - Remediation Impacts, and OWR.5 - Water Injection Impacts: The oil spill remediation and water injection impacts associated with increased throughput in the emulsion, produced water or dry oil pipelines would be the same as the baseline, therefore, these impacts would not occur.

Impact OWR.3 - Pipeline Maintenance: Impacts associated pipeline maintenance would not be applicable to ~~this alternative~~ Scenarios 2 and 3 because the production would not extend beyond that expected for the Point Pedernales operations; existing pipeline maintenance impacts would not increase beyond baseline conditions.

Impact OWR.6 - Contribution to Groundwater Basin Overdraft: This impact would not apply to ~~this alternative~~Scenarios 2 and 3 because there would be no extension of life of the project; therefore, the project would not impact the overdraft of the Lompoc Groundwater Basin beyond the current operations.

Options for Meeting California Fuel Demand. The relative onshore water resource impacts associated with the various options for meeting California fuel demand are summarized in Table 5.4.1.

Table 5.4.1 No Project Alternative Comparison to Options for Meeting California Fuel Demand, Onshore Water Resources

Source of Energy		Impacts
Other Conventional Oil & Gas		
	Domestic onshore crude oil and gas	Likely to displace, rather than eliminate, onshore water resource impacts.
	Increased marine tanker imports of crude oil	Would eliminate proposed project onshore water resource impacts.
	Increased gasoline imports[1]	Likely to displace, rather than eliminate, onshore water resource impacts.
	Increased natural gas imports (LNG)	Likely to displace, rather than eliminate, onshore water resource impacts.

Table 5.4.1 No Project Alternative Comparison to Options for Meeting California Fuel Demand, Onshore Water Resources

Source of Energy		Impacts
Alternatives to Oil and Gas		
	Fuel Demand Reduction: increased fuel efficiencies, conservation, electrification[2]	
	Alternative transportation modes	Proposed project impacts would be eliminated.
	Implementation of regulatory measures	Proposed project impacts would be eliminated.
	Coal, Nuclear, Hydroelectric	Would eliminate proposed project impacts, but could introduce power facility construction and operation impacts which could likely be greater than proposed project.
	Alternative Transportation Fuels	
	Ethanol/Biodiesel[3]	Groundwater depletion impacts could be greater for ethanol production. Other proposed project onshore water resource impacts could be reduced.
	Hydrogen[2]	Proposed project impacts would be eliminated. Potential onshore water resource impacts due to hydrogen delivery infrastructure development.
	Other Energy Resources[2]	
	Solar[2,4]	Proposed project onshore water resource impacts would be eliminated. Solar onshore water resource impacts and their severity would depend upon facility infrastructure siting.
	Wind[2,4]	Proposed project onshore water resource impacts would be eliminated. Wind onshore water resource impacts and their severity would depend upon facility infrastructure siting.
	Wave[2,4]	Proposed project onshore water resource impacts would be eliminated. Wave onshore water resource impacts and their severity would depend upon facility infrastructure siting.

Footnotes:
1. Pipeline and tanker truck import from out-of-State assumed.
2. Assumes that Tranquillon Ridge production would not be replaced with other petroleum-based energy supply.
3. Assumes ethanol and biodiesel used as blends only and therefore would reduce, but not eliminate Tranquillon Ridge or equivalent production.
4. Assumes, large centralized facilities.

5.4.5.2 VAFB Onshore Alternative

The following sections summarize the environmental setting and potential impacts to onshore water resources in the area affected by the Vandenberg Air Force Base (VAFB) Onshore Alternative.

Environmental Setting

The VAFB Onshore Alternative ~~onshore portion of the~~oil emulsion and gas pipelines,~~and~~ drilling/processing facility, power lines, pipeline tie-in station, and electrical substations are located within the southern part of the Central Coast Hydrologic Region of the South Coast and Santa Ynez Hydrologic Units in southern Santa Barbara County.

Topographic features within the alternative area are dominated by a rugged Pacific seacoast to the west, the Santa Ynez Mountains to the east, and the Santa Ynez River to the north. Precipitation in this area ranges from approximately 10 inches near the coast to 18 inches in the nearby Lompoc Hills. Average precipitation is approximately 15 inches. Most precipitation falls in the winter months, November through April. Watercourses within the alternative area are typically dry during the summer months and have flows that rise and fall in response to precipitation with the potential of producing high volumes of runoff during wet years.

Surface Waters

There are several localized drainage areas associated with this alternative that are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. The major stream system within the alternative area is the Santa Ynez River north of Highway 246 and south of the existing PXP pipelines.

The major components of the VAFB Onshore Alternative are south of the Santa Ynez River with one crossing by the alignment of the pipelines as they head north along 13th Street to connect to the existing PXP pipelines at the tie-in station. The Santa Ynez River basin and associated tributaries are discussed in detail above in Section 5.4.1.

The alternative drilling and production area is located in a sub-watershed of the Arguello Hydrologic Area, South Coast Hydrologic Unit, just north of La Honda Canyon. From this point, the pipelines head north traversing an unnamed tributary, Spring Canyon, and Bear Creek. It is at this juncture that the pipeline alignment passes into the Lompoc Canyon sub-watershed of the Santa Ynez River Super Planning Watershed, Lompoc Hydrology Study Area, Santa Ynez Hydrology Unit. The pipelines continue north to parallel Highway 246 then east and north again at the base of Lompoc Canyon to parallel 13th Street in a northeasterly direction crossing the Santa Ynez River before connecting to the existing PXP pipelines at the tie-in station.

Surface water quality for the Santa Ynez River is described in Section 5.4.1. Processed wastewater from Space Launch Complex 3 is discharged into Bear Creek. Water quality sampling of Bear Creek indicated that aluminum, iron, manganese, and mercury greatly exceeded water quality criteria. Turbidity and chlorophyll *a* levels were also high (Tetra Tech, 2006). Lower Spring Canyon also receives processed waste water. Potential pollutants from this source include chlorine, perchlorate, other products of launch vehicle emissions, and sediment (Tetra Tech, 2006).

Groundwater

The associated groundwater basin for the VAFB Onshore Alternative is the Lompoc Groundwater Basin of the Santa Ynez River Basin. The general direction of groundwater flow is from east to west, parallel to the Santa Ynez River. The Lompoc Groundwater Basin consists of three hydrologically connected subbasins: the Lompoc Plain, Lompoc Terrace, and Lompoc Uplands. The three subbasins encompass about 76 square miles, but only the Lompoc Plain and Terrace subbasins are associated with this alternative.

The Lompoc Plain sub-basin surrounds the lower reaches of Santa Ynez River and is bordered on the north by the Purisima Hills, on the east by the Santa Rita Hills, on the south by the Lompoc Hills and on west by the Pacific Ocean. This alluvial basin is divided into three

horizontal zones: an upper, middle and main zone. Based on previous hydrologic and water quality studies, these zones have only limited points of hydrologic continuity and exchange. This basin is basically in equilibrium as during periods of dry climate, water is released from Lake Cachuma to recharge groundwater levels in the eastern portion of the subbasin.

Alternative components that traverse the area surrounding Bear Canyon lie within the Lompoc Terrace groundwater basin. This basin was formed by a down-faulted block capped with permeable sediments on south VAFB south of the Lompoc Plain. This basin consists of Orcutt Sand deposits which overlay both the Graciosa and Cebada members of the Careaga Formation. The Careaga Formation is a marine formation which can yield small to moderate quantities of water. The thickness of the formation in the Terrace is 400-500' and usable groundwater in storage is estimated to be around 60,000 acre-feet. The Lompoc Plain subbasin is in equilibrium as natural recharge is augmented with periodic releases from Cachuma Reservoir.

The City of Lompoc and the surrounding incorporated communities receive their water from wells drilled in the Lompoc Plain and Lompoc Upland ground water basins. South VAFB derives all of its water from the Lompoc Terrace Basin. Total VAFB groundwater usage is approximately 4,300 AFY.

Water quality in the shallow zone of the Lompoc Plain tends to be poorest near the coast and in heavily irrigated areas of the subbasin. TDS concentrations of up to 8,000 mg/L near the coast were measured in the late 1980s. The poor quality water in this area is attributed to upwelling of poor quality connate (waters trapped in sediment layers) waters, reduction in fresh water recharge from the Santa Ynez River beginning in the early 1960s, agricultural return flows, and downward leakage of seawater from an overlying estuary in the western portion of the basin. The presence of elevated boron and nitrates (constituents common in seawater and agricultural return flow, respectively) supports this conclusion.

Groundwater of the Lompoc Terrace is generally of better quality than that of the Lompoc Plain, averaging less than 700 mg/L TDS. Some of the natural seepage from these subbasins is of excellent quality.

Impact Analysis

***Impact OWR.1 – Construction Related Impacts*:** The VAFB Onshore Alternative requires new construction activities related to the drilling and production facility, new pipelines, ~~and transmission~~power lines, pipeline tie-in station, and electrical substations; therefore, Impact OWR.1 is considered to be more severe for the alternative than the proposed project. These construction activities have the potential for disturbances to existing soil conditions, changes in local surface water flow patterns, or increased siltation of drainages including the Santa Ynez River, which could be subject to spills of drilling mud from a directional drill or bore. These impacts would be considered potentially significant.

Mitigation Measures

Mitigation Measure OWR-1 would reduce the magnitude of potential impacts to onshore water quality associated with disturbances to soils and vegetation during construction. With regard to the VAFB Alternative, the required SWPPP shall specifically address containment and clean-up of potential spills of mud from construction of the crossing of the Santa Ynez River, and from

adverse effects of other new creek and drainage crossings. The following mitigation measure would also apply:

OWR-7 The applicant shall schedule construction activities during the dry season, unless otherwise approved by SBC, CCC, CDFG, and USFWS. Construction time restrictions shall be included in the contractor bid solicitation packages and depicted on construction plans which will be provided to SBC prior to construction.

Residual Impact

With the implementation of Mitigation Measures OWR-1 and OWR-7, impacts are considered to be *significant but mitigable (Class II).*

Impact OWR.2 - Spill Related Impacts: A spill or large leak of oil could be released into the environment, which could substantially degrade surface and groundwater quality in nearby drainages and streams or rivers. Small leaks or spills, which are contained and cleaned up quickly, may have minor or negligible impacts to onshore water resources. In contrast, large spills, or pipeline ruptures, which spread to surface waters and/or groundwater may substantially degrade water quality, with potential long-term impacts to beneficial uses and biological resources. Therefore, the impacts associated with the alternative are considered significant.

Mitigation Measures

Mitigation Measures OWR-3 and OWR-5, as well as the following mitigation measures would apply.

OWR-8 Install catchment basins to prevent spills from entering the Santa Ynez River. Basin volumes shall be designed in accordance with Mitigation Measure OWR-5. Catchment basin design and construction plans shall be submitted to SBC for review and approval prior to land use clearance.

OWR-9 Implement an oil-spill response and containment plan, including catchment basins as necessary, for the drilling and production facility. The plan shall be submitted to SBC/CCC for review and approval prior to land use clearance.

Residual Impact

These mitigation measures would reduce the severity of potential spill impacts to water resources. However, the potential for impacts to surface water and groundwater resources would remain *significant (Class I).* Because spill frequencies due to the increased pipeline lengths associated with the VAFB Onshore Alternative would increase in comparison to the proposed project, this impact is considered more severe for the alternative.

***Impact OWR.3 - Pipeline Maintenance*:** Ground disturbances resulting from pipeline repair and maintenance could result in erosion and siltation of nearby drainages and surface water bodies. These would be due primarily to the required excavation and replacement of pipeline segments. These impacts would be considered significant. Implementation of Mitigation Measure OWR-1 and OWR-6 would reduce the potential for causing significant erosion or siltation associated with excavation along the pipeline right-of-way. The residual impact is expected to be *significant but mitigable (Class II).* The severity of this impact would be slightly greater than the proposed project because of the increased pipeline lengths associated with the VAFB Onshore Alternative.

Impact OWR.4 - Spill Remediation Impacts: Remediation activities related to a release of oil from the pipeline, ~~or~~ drilling/production facility, or tie-in station would involve the mobilization of construction equipment, possible modification of drainage or stream/river terrain, and the travel of construction equipment off road. These activities could result in erosion and siltation of nearby drainages and surface water bodies as well as permanent changes to drainage and stream/river bed characteristics, which could adversely impact surface water quality. These activities are considered to be potentially significant. Implementation of Mitigation Measures OWR-1 and OWR-6 would reduce the potential for significant erosion or siltation caused by spill remediation activities along the pipeline right-of-way. Residual impacts are expected to be *significant but mitigable (Class II).* The severity of this impact would be similar to the proposed project.

***Impact OWR.5 - Water Injection Impacts*:** Produced water disposal via onshore injection, if used, could infiltrate and contaminate fresh water aquifers. The discussion in Section 5.4.4 of this EIR related to the Safe Drinking Water Act (SDWA) of 1974, and regulation of injection wells by the Department of Conservation, Division of Oil, Gas, and Geothermal Resources, applies to this alternative. The residual impact associated with injection of produced water would be *adverse but not significant (Class III).* No mitigation measures are proposed. If Produced Water Scenarios 2 or 3 are implemented (onshore injection of produced water) the severity of this impact would be greater for the VAFB Onshore Alternative in comparison to the proposed project because a greater volume of water would be injected onshore with the alternative, whereas for the proposed project, most produced water would be injected (or discharged) offshore.

Impact OWR.6 - Contribution to ~~Lompoc~~ Groundwater Basin Overdraft: This impact would be the same for the VAFB Onshore Alternative as the proposed project.

Impact #	Impact Description	Phase	Residual Impact
OWR.7	Potential "frac-out" of boring muds could cause siltation and degrade surface water quality.	*Construction*	*Class II*

Directional drilling under the Santa Ynez River would be utilized to install the VAFB Onshore Alternative pipelines. Drilling has the potential to indirectly impact surface water quality through the inadvertent release of drilling muds through natural subsurface fractures (frac-out). Drilling muds typically consist of a mixture of bentonite and water. Bentonite is an inert clay material and is considered essentially nontoxic to aquatic organisms although it can have adverse physical effects on organisms that get coated. Due to the larger diameter bore that would be required to install the VAFB Onshore Alternative pipelines, the risk of frac-out is considered greater for the alternative than the proposed project power line.

Mitigation Measures

Mitigation Measures TB-16 and TB-17 would minimize impacts associated with a frac-out. The following measure would reduce impacts associated with soil erosion and sedimentation:

OWR-10 The applicant shall monitor boring operations, immediately cleaning spilled drilling muds, restricting construction activities to avoid potential conflicts with special

status species, and use of best management practices to prevent or minimize soil erosion and effects of siltation on surface waters.

Residual Impact

The residual impact would be considered *significant but mitigable (Class II).*

~~Impact #~~	~~Impact Description~~	~~Phase~~	~~Residual Impact~~
~~OWR.8~~	~~The VAFB Onshore Alternative would contribute to the possible overdraft of the Lompoc groundwater basin.~~	~~*Operations*~~	~~*Class III*~~

~~The VAFB Onshore Alternative would contribute to the overdraft of the Lompoc groundwater basin. As mentioned in the environmental setting above, the groundwater basin is presently in a state of overdraft with net extractions exceeding recharge by 913 acre-feet per year in 2000. Construction and operation of the VAFB Onshore Alternative would continue the consumption of an overused resource. However, the alternative drilling and production site, the major user of groundwater for the alternative, is located within the Lompoc Terrace. As noted above, the Lompoc Terrace has experienced an average gain of 33 AFY between 1975 and 2000.~~

~~*Mitigation Measures*~~

~~No mitigation measures have been identified.~~

~~*Residual Impact*~~

~~Impact OWR.8 is considered *adverse but not significant (Class III).*~~

Impact #	Impact Description	Phase	Residual Impact
OWR.~~8~~9	Scour from large flood events could uncover, expose, and place the pipeline at risk for rupture at Santa Ynez River and Bear Creek crossings.	*Operations*	*Class II*

Flood scour at river crossings could result in pipeline rupture and subsequent contamination of river flows. This impact would be considered significant.

Mitigation Measures

Mitigation Measure OWR-11 applies.

OWR-11 The pipelines shall be placed below the 100-year depth of scour at all river crossings. The river cross section topography shall not be altered in a manner that would result in increased levels of scour or erosion. Pipeline construction plans for the Santa Ynez River and Bear Creek crossings shall be submitted to SBC for review and approval prior to land use clearance.

Residual Impact

With the implementation of Mitigation Measure OWR-11, this impact is considered to be *significant but mitigable (Class II).*

Impact #	Impact Description	Phase	Residual Impact
OWR.~~9~~1~~0~~	Disturbance of sites contaminated with hazardous substances could result in contamination of surface water and groundwater.	*Construction*	*Class II*

There are currently 136 sites identified as hazardous substance release sites by the federal Installation Restoration Program (IRP) on VAFB. These sites are remediated through the Federal Facilities Site Remediation Agreement (FFSRA), a working agreement between the U.S. Air Force, the RWQCB Central Region, and the Department of Toxic Substances Control. In addition to IRP sites, there are additional Areas of Concern, where potential hazardous material releases are suspected, and Areas of Interest, which have a potential for the presence of a hazardous substance. Activities associated with the installation of an onshore drilling and production facility, and associated pipelines may encounter contaminated soils or sites in at least two locations (Ryan, 2006). Disturbance of these sites may result in contamination of surface and/or groundwater.

Mitigation Measure

Mitigation Measure OWR-12 applies.

OWR-12 The applicant shall work with the U.S. Air Force, the RWQCB Central Region, and the Department of Toxic Substances Control to identify Federal Installation Restoration Program (IRP) sites, Areas of Concern and Areas of Interest within the construction area, and characterize the nature and extent of hazardous substances that may be present at each. In conjunction with the USAF, the RWQCB Central Region, and the Department of Toxic Substances Control, the applicant shall develop a plan of action to avoid and/or minimize any contamination of groundwater or surface water that may result from construction in these areas. Permits/approvals from these respective agencies shall be provided to SBC prior to construction.

Residual Impact

Mitigation Measure OWR-12 would reduce this impact to *less than significant with mitigation (Class II).*

5.4.5.3 Casmalia East Oil Field Processing Location

This alternative would involve the relocation of the LOGP facility to the Casmalia East location identified in the North County Siting Study (SBC, 2000). The pipelines would also be routed to the north along Harris Grade Road, Highway 135 and then east to the Casmalia East location.

Building a new processing site at Casmalia East near Orcutt, and trenching for new pipelines from this processing site to the LOGP would result in extensive ground disturbance. It is likely that this new construction would result in significant impacts on unnamed tributaries to Graciosa Creek along the pipeline route. New impacts on water resources would likely be greater than the proposed project's construction activities due to the extensive ground disturbance involved with this alternative, and because new tributaries would be crossed by the pipeline array in addition to existing crossings along the pipe corridor.

Impact OWR.1 - Construction Related Impacts: Impacts associated with construction of the power line and installation of the pumps at Valve Site #2 would still occur under this alternative. Impacts would be of the same type but of greater severity, as construction would require more earth disturbances and more opportunity for erosion and drainage siltation. Impacts would remain *significant but mitigable (Class II)* and Mitigation Measure OWR-1 would still apply.

Impact OWR.2 - Spill Related Impacts: Oil spill impacts associated with increased throughput in the emulsion, produced water or dry oil pipeline would be the same as the proposed project. The impact would be considered *significant (Class I).* Mitigation Measures OWR-2 through OWR-6 would apply to this alternative. The impact associated with extension of life would also apply to this alternative.

Impact OWR.3 - Pipeline Maintenance: Impacts associated with pipeline maintenance would be applicable to this alternative because the production would extend beyond that expected for the Point Pedernales operations. Impacts would remain *significant but mitigable (Class II)* and Mitigation Measure OWR-9 would still apply.

Impact OWR.4 - Remediation Impacts: Impacts associated with spill remediation would still be applicable due to the increased throughput and extension of life issues of this alternative. Impacts would be considered *significant but mitigable (Class II).* Mitigation Measure GR-1 would still apply.

Impact OWR.5 - Water Injection Impacts: Impacts associated with water injection into the aquifers would be similar to the proposed project, as there would be an increase in injection rates. However, given the permitting, monitoring, and reporting requirements of CDOGGR, impacts would be considered to be *adverse but not significant (Class III).*

Impact OWR.6 - Contribution to Groundwater Basin Overdraft: This impact would be the same as for the proposed project, *adverse but not significant (Class III)*, but for a different aquifer.

5.4.5.4 Alternative Power Line Routes to Valve Site #2

Impacts OWR.2 through OWR.6 would remain the same as the proposed project for all of the alternative power line routes discussed below.

Alternative Power Line Route – Option 2a

Impact OWR.1 - Construction Related Impacts: Impacts associated with construction would be the same as the proposed project. The installation of power poles for crossing the Santa Ynez River, and the relocation of the power line to the west side of 13th Street would not increase the severity of this impact over that for the proposed project. The impact would be considered *significant but mitigable (Class II).* Mitigation Measure GR-1 would apply to this alternative.

Alternative Power Line Route – Option 2b

Impact OWR.1 - Construction Related Impacts: With this option the power line would be placed under the Santa Ynez River via a directional bore. The boring activities would require two 150 foot by 150 foot work areas on either side of the Santa Ynez River adjacent to the proposed

power line route. These areas would temporarily expose stockpiled or disturbed soils to wind and water erosion, which could result in an increase in potential siltation within the river. The disturbed area of the project would also require the implementation of a SWPPP. This is considered *significant but mitigable (Class II).* Mitigation Measure GR-1 would still apply.

Impact OWR.7 – Frac-out of Boring Muds: Spills or losses through the formation (i.e., frac out) of drilling fluids could affect surface water resources. Drill muds typically consist of a mixture of bentonite and water. Bentonite is an inert clay material and is considered essentially nontoxic to aquatic organisms although it can have adverse physical effects on organisms that get coated. Nevertheless, drilling muds losses could cause temporary and localized increases in turbidity and suspended solids concentrations and promote siltation within the Santa Ynez River. Therefore, impacts to onshore water resources would be potentially *significant but mitigable (Class II)* with the implementation of Mitigation Measure OWR-9.

Underground Power Line along Terra Road

Impact OWR.1 - Construction Related Impacts: Trenching, required for installing of power lines to Valve Site #2, would temporarily disturb soils along the power line route. Soils removed during trenching would be susceptible to erosion and transport during storm events. Impacts from erosion and siltation could be minimized by scheduling construction during summer and fall, and using construction BMPs (erosion control measures). Impacts would remain *significant but mitigable (Class II)* and Mitigation Measures OWR-1 and GR-1 would still apply. The severity of this impact would be greater than for the proposed project due to the more extensive construction.

5.4.5.5 Replacement of Oil Emulsion Pipeline from Platform Irene to LOGP

Impact OWR.1 - Construction Related Impacts: This alternative would not include construction at Valve Site #2 but rather would include the replacement of the existing crude oil pipeline from Platform Irene to the LOGP with a new pipeline. Installation of a new pipeline would involve excavation along the present pipeline route, removing the existing oil emulsion pipeline, and replacing it with a new pipeline. Therefore, all ground disturbances associated with construction of a new pipeline would occur within the previously disturbed ROW. This section addresses potential impacts to onshore water resources associated with the installation of a replacement pipeline between pipeline landfall at Wall/Surf Beach to the LOGP.

Impacts to onshore water resources from construction of a replacement pipeline would be comparable to those associated with installation of the original pipeline, which was evaluated in 1985 Point Pedernales Project EIR/EIS. Excavation, minor grading, and vegetation removal associated with replacement pipeline construction would temporarily expose disturbed soils to wind and water erosion, and thereby result in a minor increase in potential siltation of the nearby Santa Ynez River and adjoining creeks and drainages. With the exception of localized, erosion-prone areas, replacement of the pipeline within the existing corridors would result in less than significant impacts.

Impacts to erosion-prone areas, such as portions of Oak Canyon and Santa Lucia Canyon, would be considered potentially significant, although the impacts could be reduced to insignificance by implementing Mitigation Measures OWR-1, OWR-7, GR-1 through GR-4, and TB-4 and TB-5,

which address using best management practices to prevent or minimize soil erosion and effects of siltation on surface waters. These mitigation measures include: development of a SWPPP, limiting construction to the dry season; installing sediment retention and flow diversion devices at the construction site; and mulching slopes and revegetating immediately following construction. These potentials for impacts associated with erosion and siltation would be considered short-term, and expected to persist until vegetation is re-established in disturbed areas along the pipeline route. Construction impacts on water quality would be considered *significant but mitigable (Class II)*. The severity of this impact would be substantially greater than for the proposed project due to the greater area of construction.

Impact OWR.2 - Spill Related Impacts: Oil spill impacts associated with increased throughput in the emulsion, produced water or dry oil pipeline would be the same as the proposed project. The impact would be considered *significant (Class I).* Mitigation Measures OWR-2 through OWR-5 would apply to this alternative. The impact associated with extension of life would also apply to this alternative. The degree of this impact would be less than for the proposed project due to the reduced risk of spill from the new portion of the pipeline.

Impact OWR.3 - Pipeline Maintenance: Impacts associated with pipeline maintenance would be applicable to this alternative because the production would extend beyond that expected for the Point Pedernales operations. However, impacts would be less severe as fewer pipeline maintenance activities would be expected with the newer pipeline. Impacts would remain *significant but mitigable (Class II)* and Mitigation Measures OWR-8 and OWR-9 would still apply.

Impact OWR.4 - Remediation Impacts: Impacts associated with oil spill remediation would still be applicable due to the increased throughput and extension of life issues of this alternative. Impacts would be considered *significant but mitigable (Class II).* Mitigation Measures OWR-1, GR-1 and OWR-9 would still apply.

Impact OWR.5 - Water Injection Impacts: Impacts associated with water injection into the aquifers would be the same as the proposed project, as there would be an increase in injection rates over current operations. However, given the permitting, monitoring, and reporting requirements of CDOGGR, impacts would be considered *adverse but not significant (Class III).*

Impact OWR.6 - Contribution to Groundwater Basin Overdraft: This impact would be the same as the proposed project: adverse but not significant (Class III).

5.4.4.6 Alternative Drill Muds and Cuttings Disposal

Inject Drill Muds and Cuttings into Reservoir

Onshore activities under this alternative would be the same as for the proposed project. Therefore, impacts on onshore water resources would be the same as for the proposed project.

Transport Drill Muds and Cuttings to Shore for Disposal

Onshore disposal activities would not affect onshore water resources; therefore, its impacts would be the same as for the proposed project. Since the material would be disposed of onshore, the potential for some impact exists. However, as the disposal would be to a licensed facility, it is assumed no new impacts to water resources would occur.

5.4.6 Cumulative Impacts

5.4.6.1 Offshore Oil and Gas Projects

The majority of the offshore oil and gas development projects discussed in Sections 4.~~1~~2 and 4.~~2~~3 would primarily use existing infrastructure. However, within the northern Santa Maria Basin, exceptions could potentially include development of the federal OCS Santa Maria, Lion Rock, Point Sal, and Purisima Point Units and Lease OCS-P 0409. Collectively, if implemented, these potential projects could involve up to three new offshore platforms and three associated off- to onshore pipelines (see Section 4.~~2~~1.5). Production of the Santa Maria, Lion Rock, Point Sal, and Purisima Point Units and Lease OCS-P 0409 would be hypothetically sent to a new onshore processing facility in Casmalia. These cumulative oil and gas development projects would increase the severity of impacts to onshore water quality due to an oil or produced water spill. Although it is assumed that these potential projects would be subject to the same or similar onshore water resources mitigation measures as recommended for the proposed project, their cumulative impacts, and the proposed project's incremental contribution to them, would still be considered significant.

The remainder of the cumulative offshore oil and gas projects would occur in the southern Santa Maria Basin and Santa Barbara Channel, and their production would be transported to and processed at existing facilities located along Santa Barbara's south coast. Consequently, these projects would not be expected to have any geographic overlap with the watersheds affected by the proposed project. Therefore, the proposed project would not incrementally contribute to the potential onshore water resources cumulative impacts associated with these projects.

5.4.6.2 Onshore Projects

Proposed onshore development projects in the study area would locally increase impervious ground cover reducing rates of groundwater recharge and increasing storm water run-off. Due to the limited new impervious surfaces associated with the proposed project, the proposed project's incremental contribution would not be considered cumulatively significant. As noted in Section 5.2, Terrestrial Biology, due to the limited amount and duration of both construction-related grading and maintenance-related grading, the proposed project's incremental contribution to cumulative water quality impacts due to sedimentation also would not be considered significant. The potential onshore development projects outlined in Section 4.~~4~~3 would be subject to the same stormwater runoff regulations that apply to the proposed project construction, which would serve to mitigate these impacts. Of the three onshore projects associated with the Santa Ynez River, two may affect the volume of water currently reaching the lower reaches of the river. The third project is not expected to affect reaches of the river below Bradbury Dam (the Bee Rock Quarry Expansion Project) (County of Santa Barbara, 2006). Project-specific mitigation measures related to the two projects that may affect the downstream reaches of the river, if approved, would be assumed to reduce all or some of the adverse onshore water resources impacts associated with their implementation; consequently, cumulatively significant impacts would not be anticipated to occur. Implementation of the proposed project would not affect the volume of water received by the lower reaches of the river. Therefore, it would not incrementally contribute to any cumulative impacts~~would not be expected to be significant~~ related to surface water flows in the Santa Ynez River.

5.4.7 Mitigation Monitoring Plan

Mitigation Measure	Mitigation Requirements and Timing	Method of Verification	Timing of Verification	Party Responsible For Verification
OWR-1	Prepare a Stormwater Pollution Prevention Plan (SWPPP) that describes Best Management Practices (BMPs) to be implemented for the purpose of minimizing soil loss and other construction-related sources of water pollution for any new construction associated with the project. The SWPPP will be prepared in accordance with RWQCB guidelines and will designate BMPs that will be followed during construction activities. Erosion-minimizing efforts may include measures such as avoiding excessive disturbance of steep slopes; using drainage control structures (e.g., coir rolls or silt fences) to direct surface runoff away from disturbed areas; strictly controlling soil stockpiling and vehicular traffic; implementing a dust-control program during construction; restricting access to sensitive areas; using vehicle mats in wet areas; and revegetating disturbed areas following construction. Erosion-control measures will be installed before extensive clearing and grading begins, and before the onset of winter rains. The SWPPP BMPs shall specify that the staging of construction materials, equipment, and excavation spoils, and refueling of equipment will be performed at least 100 feet outside of drainage channels and intermittent streams, where these receive overland runoff. Mulching, seeding, or other suitable stabilization measures will be used to protect exposed areas during and after construction activities. If required, concrete washout stations will be established to avoid direct release to surface water or to areas where groundwater could become contaminated. The SWPPP shall be submitted to SBC/CCC for review and approval prior to construction.	Review and approval of plans. Inspection of BMPs	Prior to construction	SBC P&D CCC
OWR-2	The applicant shall construct a berm around Valve Site #2 with sufficient capacity to retain 150 percent of the maximum spill volume associated with this portion of the onshore pipeline (see Section 5.1, Risk of Upset). The applicant shall submit specific plans for the catchment basin at Valve Site #2 to SBC/CCC for review and approval prior to land use clearance. The berm shall be installed prior to operations.	Plan review prior to land use clearance.	Site inspections before construction sign-off. Berm installation before operation of facilities.	SBC P&D B&S CCC
OWR-3	Update the Oil Spill Contingency Plan and the November 2004 Oil Spill Response Plan and July 2005 Supplement to address the SCADA system and GR.1-related requirements for the proposed project and conduct annual readiness exercises and audits to ensure that containment and cleanup equipment is readily available close to areas with greatest vulnerability to spills (e.g.,	Review of OSCP and attendance at training drills.	Annual readiness exercises and spill prevention and cleanup equipment audits.	SBC P&D CCC

Mitigation Measure	Mitigation Requirements and Timing	Method of Verification	Timing of Verification	Party Responsible For Verification
	along the lower sections of the Santa Ynez River).			
OWR-4	PXP shall ensure that catchment basins located along the Santa Ynez River section of the pipeline are cleaned and surveyed periodically to ensure that they are capable of holding at least 110 percent of the associated release volume from nearby pipeline segments. Prior to land use clearance, PXP shall provide volume calculations to SBC for each of the catchment basins for the following leak scenarios: (1) 11 minutes of pumping time for a worst case leak in accordance with the MMS Oil Spill Response Plan, Volume 2, worst case scenario, and (2) 20 minutes of pumping time for a small leak as detected by the PXP leak detection system. The total pipeline emulsion fluids, including produced water, shall be included in the calculations. If it is determined that the volume of any of the catchment basins is insufficient to fully contain the leak scenarios analyzed, the catchment basin(s) shall be expanded. Plans for catchment basin(s) expansion shall be submitted to SBC for review and approval prior to land use clearance.	Review and approval of calculations and expansion plans. Inspection of basins.	Calculation and plan review prior to land use clearance. Periodic inspection of pipeline route.	SBC P&D CCC
OWR-5	Ensure that any pipeline replacement within stream beds is engineered such that the replacement pipeline and any pipeline support structures are protected from scour and erosion effects of a 100-year flood discharge. Plans demonstrating these requirements shall be submitted to SBC/CCC for review and approval prior to land use clearance.	Review and approval of plans.	Prior to land use clearance	SBC CCC
OWR-6	If soil excavation is needed to expose buried pipeline or cleanup a spill within a stream bed, the area shall be restored to the maximum extent feasible to pre-spill conditions after excavation is completed.	Construction drawings. Part of spill report..	Immediately after spill occurrence.	SBC P&D
OWR-7 (VAFB Onshore and Emulsion Pipeline Replacement Alternatives only)	The applicant shall schedule construction activities during the dry season, unless otherwise approved by SBC, CCC, CDFG, and USFWS. Construction time restrictions shall be included in the contractor bid solicitation packages and depicted on construction plans which will be provided to SBC prior to construction.	Schedule restrictions shall be part of contractor bid solicitation packages and construction plans.	Review of solicitation packages and construction plans.	SBC P&D CCC
ORW-8 (VAFB Onshore Alternative only)	Install catchment basins to prevent spills from entering the Santa Ynez River. Basin volumes shall be designed in accordance with Mitigation Measure OWR-5. Catchment basin design and construction plans shall be submitted to SBC for review and approval prior to land use clearance.	Plan review and approval	Prior to land use clearance	SBC P&D
OWR-9 (VAFB Onshore Alternative only)	Implement an oil-spill response and containment plan, including catchment basins as necessary, for the drilling and production facility. The plan shall be submitted to SBC/CCC for review and approval prior to land use clearance.	Plan review and approval	Prior to land use clearance	SBC P&D CCC

Mitigation Measure	Mitigation Requirements and Timing	Method of Verification	Timing of Verification	Party Responsible For Verification
OWR-10 (VAFB Onshore and Power Line Route – Option 2b Alternatives only)	The applicant shall monitor boring operations, immediately cleaning spilled drilling muds, restricting construction activities to avoid potential conflicts with special status species, and use of best management practices to prevent or minimize soil erosion and effects of siltation on surface waters.	Review of Frac-out Contingency Plan and site inspections during construction.	Prior to construction and during construction.	SBC P&D B&S CCC
OWR-11 (VAFB Onshore Alternative only)	The pipelines shall be placed below the 100-year depth of scour at all river crossings. The river cross section topography shall not be altered in a manner that would result in increased levels of scour or erosion. Pipeline construction plans for the Santa Ynez River and Bear Creek crossings shall be submitted to SBC for review and approval prior to land use clearance.	Plan review and approval	Prior to land use clearance	SBC P&D
OWR-12 (VAFB Onshore Alternative only)	The applicant shall work with the U.S. Air Force, the RWQCB Central Region, and the Department of Toxic Substances Control to identify Federal Installation Restoration Program (IRP) sites, Areas of Concern and Areas of Interest within the construction area, and characterize the nature and extent of hazardous substances that may be present at each. In conjunction with the USAF, the RWQCB Central Region, and the Department of Toxic Substances Control, the applicant shall develop a plan of action to avoid and/or minimize any contamination of groundwater or surface water that may result from construction in these areas. Permits/approvals from these respective agencies shall be provided to SBC prior to construction.	Permit issuance	Prior to construction	U.S. Air Force, RWQCB, Department of Toxic Substances Control

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Figures 5.4-1: Photograph of Pipeline Route Crossing Small Drainage Feature Near Basin 4.

Figures 5.4-2: Example of a Catchment Basin (Basin 1) Adjacent to Onshore Portion of the Pipeline Route. *(A weired Concrete Outlet is Shown Near the Upper Left Corner of the Photograph.)*

Source: MRS, 2002.

PREPARED BY Aspen Environmental Group

Figures 5.4-1 & 5.4-2
Photographs