

SECTION 5.3 ENVIRONMENTAL JUSTICE

On February 11, 1994, President Clinton issued an executive order to address questions of equity in the environmental and health conditions of impoverished communities. The Proposed Action is not expected to increase onshore development related to offshore oil and gas. Since the Proposed Action is located offshore the only direct Environmental Justice implications would be related to subsistence fishing and gathering or religious and cultural practices of native populations. A discussion of cultural and religious practices of the native populations is contained in section 4.7 of this document.

The percentage of minority population in each county in the Study Area is shown on Table 5.3-1. The Proposed Action is not expected to result in onshore impacts in the study area and therefore is not anticipated to have a disproportionate effect on low income and minority communities.

Table 5.3-1. Population by Ethnic and Racial Group

	1990	% of Total	2000	%Change/ % of Total	2010	%Change/ % of Total
San Luis Obispo	217,944	100.00%	254,818	16.92%	324,741	27.44%
White	177,031	81.23%	203,347	79.80%	253,097	77.94%
Hispanic	29,122	13.36%	37,122	14.57%	52,459	16.15%
Asian or Pacific Islander	5,783	2.65%	7,461	2.93%	10,527	3.24%
Black	4,351	2.00%	5,166	2.03%	6,770	2.08%
American Indian	1,657	0.76%	1,722	0.68%	1,888	0.58%
Santa Barbara	370,893	100.00%	412,071	11.10%	468,457	13.68%
White	245,005	66.06%	244,212	59.26%	240,087	51.25%
Hispanic	99,104	26.72%	134,725	32.69%	188,294	40.19%
Asian or Pacific Islander	15,185	4.09%	20,218	4.91%	25,801	5.51%
Black	9,442	2.55%	10,293	2.50%	11,139	2.38%
American Indian	2,157	0.58%	2,623	0.64%	3,136	0.67%
Ventura	670,274	100.00%	753,820	12.46%	854,580	13.37%
White	441,280	65.84%	452,133	59.98%	468,465	54.82%
Hispanic	177,998	26.56%	233,041	30.91%	293,969	34.40%
Asian or Pacific Islander	32,939	4.91%	48,284	6.41%	69,252	8.10%
Black	14,617	2.18%	16,738	2.22%	19,027	2.23%
American Indian	3,440	0.51%	3,624	0.48%	3,867	0.45%
Total Study Area	1,259,111	100.00%	1,420,709	100.00%	1,647,778	100.00%
White	863,316	68.57%	899,692	63.33%	961,649	58.36%
Hispanic	306,224	24.32%	404,888	28.50%	534,722	32.45%
Asian or Pacific Islander	53,907	4.28%	75,963	5.35%	105,580	6.41%
Black	28,410	2.26%	32,197	2.27%	36,936	2.24%
American Indian	7,254	0.58%	7,969	0.56%	8,891	0.54%

5.4 ENVIRONMENTAL IMPACTS OF ALTERNATIVE 2: ONSHORE DISPOSAL OF MUDS AND CUTTINGS

Alternative 2 requires that all mud and cuttings be barged to shore for onshore disposal at an approved disposal site. This operation would entail storing the mud and cuttings in bins, transporting the bins to shore via workboat, and trucking the bins to an approved disposal.

Since the type and size of the semi-submersible is unknown, the onboard storage capacity for muds and cutting can not be estimated. For the Sedco 712, the onboard storage capacity for liquid mud is 900 bbls. There will likely be space to store cuttings on the semi-submersible until the transport boat arrives at the rig to take the cuttings to shore for disposal. The amount of muds that would be generated in the 5 proposed wells ranges from 3000 – 12,250 bbls/well, while the amount of cuttings ranges from 1805 – 4270 bbls/well. Operators have only used the onshore disposal option on rare occasions. Based on this past experience in the Pacific OCS Region, a workboat would be used to transport the mud and cuttings to shore. It is assumed that the 180-foot class workboat described in the Project Description would be used. The cuttings and mud would be transferred to a workboat in U. S. Coast Guard-approved storage bins, via crane. These bins must be covered in order to fulfill regulatory requirements for travel over water (DOT) and to prevent emissions from ventilating into the atmosphere.

The rate and number of workboat trips to port depends on the volume and rate cuttings are produced when drilling each well. Typically, the rate cuttings are circulated to the rig floor is greater when drilling the upper portion of the well because of the faster drilling rate and the larger diameter hole. The number of bins that can be placed on the workboat is dependent

on weather, safety, available space, and other factors. Costly rig downtime and raised serious health and safety concerns are associated with offloading bins during poor weather conditions. In consultation with Port Hueneme, it is estimated that under good weather conditions between 9 to 15 bins could be transported by a 180-foot workboat. An average of 12 bins per trip was assumed for this analysis.

There are numerous facilities in California that can take offshore-generated oil field wastes. The closest facility capable of accepting oil field waste is located near Bakersfield, approximately 150 miles from Port Hueneme. In order to ensure compliance with DOT regulations, a maximum load weight (not including the truck weight) of 20,000 lbs. should be utilized. In consulting with trucking companies, depending on the weight of the material, up to 8 or 9 cubic yards (38 to 42 bbls) could be transported per truckload.

Table 5.4-1 summarizes the estimated volumes of mud and cuttings for each well, the approximate number of bins, estimated number of trips to shore, estimated miles from the unit to port, and estimated number of tank trucks to transport the cuttings to an approved disposal site. The table is based on the following assumptions:

- The operational storage capacity for the U. S. Coast Guard approved storage bins is 35 bbls
- The estimated number of trips to port is calculated based on transporting 12 bins per trip
- The estimated round trip mileage from the Unit to port is calculated based on taking drilling mud and cuttings to Port Hueneme
- The estimated number of truck trips is calculated based on a tank truck volume of 35 bbls.

Table 5.4 -1. Estimated volumes of mud and cuttings for each well, the approximate number of bins, estimated number of trips to shore, estimated round trip miles from the unit to port, estimated number of tank trucks.

Well	Mud Volume (bbls)	Cuttings Volume (bbls)	No. bins ¹	No. of Trips to Shore ²	Miles to Port Hueneme ³	No. of tank trucks ⁴
Bonito (well 1)	3000	1,805	140	12	204 miles	140
Bonito (well 2)	3000	1,805	140	12	204 miles	140
Purisima Point	12,250	2,112	410	35	240 miles	410
Point Sal	12,250	2,112	410	35	240 miles	410
Gato Canyon	3000	4,270	210	20	100 miles	210

¹ The operational storage capacity for the bins is 35 bbls (<20,000 lbs.)

² the estimated number of trips to port was calculated based on transporting 12 bins per trip

³ the estimated mileage from the Unit to port is calculated based on round trip to Port Hueneme

⁴ the estimated number of truck trips was calculated based on a standard tank truck volume of 35 bbls.

Effects of Alternative 2: The analysis of Alternative 2 is based primarily on the scenario for the Proposed Action (delineation drilling) since the only differences are that offshore discharges of muds and cuttings would be eliminated. Therefore, the sources of impacts associated with Alternative 2 and the impacts will be the same as those discussed for the Proposed Action with the exception of the following resources:

Air Quality: Air quality impacts associated with the alternative barging of well muds and cuttings to shore for onshore disposal was analyzed. The operation would entail the onsite storage of muds and cuttings in bins, transporting the bins to shore via workboat, and trucking the bins to an approved site. A 180-foot workboat is assumed for the analysis with an average of 12 bins per trip transported to Port Hueneme in Ventura County for offloading onto tanker trucks. The tanker trucks will be transported 150 miles to an approved onshore disposal site located outside of Bakersfield. Vessel and mobile source emission estimates were developed based on the following estimates of vessel and truck trips necessary for the transport of the muds and cuttings to shore.

Mobile source emission estimates for NO_x, CO and VOC were derived by utilizing emission factors for heavy-duty diesel powered trucks located in Volume II, Appendix H of AP-42 (AP-42, EPA, 2000). A 1995 model year truck was assumed for calculation purposes. Emission estimates for the workboat emissions were derived from AP-42 emission factors and fuel usage assumptions as determined in the Santa Barbara APCD Crew and Supply Boat Study (SBCAPCD, 1987). Table 5.4-2 presents the estimated emission increases expected per Proposed Action with the additional workboat and onshore tanker truck trips for Alternative 1.

Emission estimates for Alternative 2 are projected to increase emissions ranging from 8-36 percent beyond those expected with the proposed onsite discharge of muds and cuttings. The Bonito and Gato Units would exhibit the lower percentage increases in emissions due to the lower volume of muds and cuttings expected to be transported to shore and the shorter distance to Port Hueneme from those units. A two well scenario at Bonito would effectively double the total emission estimate for Bonito. The Santa Maria Basin Units are expected to exhibit a much greater increase in emissions due to the increased volume of muds and cuttings to be transported to shore and the greater distance to shore requiring a greater frequency of vessel and truck trips.

Alternative 2 is expected to increase total emissions ranging between 8-36 percent greater than those predicted for the Proposed Action due to the projected increase in vessel and truck trips. However, the increase in total emissions is not expected to increase the peak hour emissions projected and modeled for the site preparation stage of the Proposed Action. Therefore, no increases to onshore predicted concentrations affecting the ambient air standards are expected with this Alternative as the emissions do not overlap with the modeled emissions during the site preparation stage. Emission increases projected from the vessel emissions will be subject to permit and emission offset requirements per SBCAPCD Rules and Regulations. Impacts to Santa Barbara County air quality from the proposed Alternative are considered to be low.

Onshore impacts from additional tanker truck trips will occur in Ventura County. Increases in onshore mobile source emissions will add approximately 1.6 tons of NO_x over 14 months to the Ventura County

Table 5.4-2. Alternative 2 emission increase estimates.

Unit	NO _x	CO	VOC	SO _x ¹	PM ₁₀ ¹
Bonito					
Vessel	2.69	1.27	1.72	0.07	0.34
Truck	0.19	0.27	0.05	--	--
Total	2.88	1.54	1.76	0.07	0.34
Purisima Point					
Vessel	9.24	4.37	5.89	0.24	1.16
Truck	0.56	0.78	0.14	--	--
Total	9.80	5.15	6.03	0.24	1.16
Point Sal					
Vessel	9.24	4.37	5.89	0.24	1.16
Truck	0.56	0.78	0.14	--	--
Total	9.80	5.15	6.03	0.24	1.16
Gato Canyon					
Vessel	2.20	1.04	1.40	0.06	0.28
Truck	0.28	0.40	0.07	--	--
Total	2.48	1.44	1.47	0.06	0.28

1- heavy duty diesel emission factors not provided for SO_x And PM₁₀¹⁰

mobile-source emission budget. The proposed increase in on-road emissions is considered to have low impacts to Ventura County air quality. Therefore, overall impacts to regional air quality from Alternative 2 are expected to be low.

WaterQuality: Impacts to water quality from alternative remains the same as for the Proposed Action, except that no impacts to water quality will occur due to the discharge of drilling muds and cuttings. Initial drilling of any of the wells entails penetration of the seafloor with no direct connection to the drilling floor on the MODU. This means that as the drill bit penetrates the sea floor, initial drilling fluid (composed of seawater and gel) and cuttings will be deposited onto the sea floor. These depositions will raise sediment into the water column in a fashion similar to that described in Section 5.2.2.1, when discussing resuspension processes. Once this phase of the drilling operations is over and the casing is set, all drilling muds and cuttings will be returned to the drilling rig, cleaned, and barged to shore.

As noted in Section 5.2.2, drilling muds and cuttings discharges from the drilling of the five proposed wells, will cause a low impact to water quality. The other discharges that could occur from the drilling activities, also described in Section 5.2.2, caused only a negligible impact to water quality. Thus, under this alternative, only negligible impacts to water quality will occur.

If, during the lifting the bins of drilling muds and cuttings onto the supply boat by crane, a bin is dropped into the sea and the muds are spilled, a negligible impact to water quality will occur. This is because a maximum of 35 bbl of muds and cuttings will be exposed to being spilled at any one time. Even if there is some hydrocarbon, or other contamination in the muds, water quality will be impacted no worse than at a negligible level.

Seafloor Resources: This alternative would benefit seafloor resources in general, reducing impacts to both soft and hard substrate resources. Onshore disposal of muds and cuttings would all but eliminate the introduction of turbidity at the wellsite locations (a small amount of cuttings with seawater would be discharged until the first string is drilled) and would avoid smothering impacts to potentially sensitive hard substrate communities at all wellsites.

Marine Mammals: Onshore disposal of muds and cuttings would add about 2 supply boat trips per week to the support traffic estimated to occur as part of the proposed delineation activities. The effects of this alternative on marine mammals remain the same as those described for the Proposed Action (Section 5.2.8).

Threatened and endangered Marine Mammals: Onshore disposal of muds and cuttings would add about 2 supply boat trips per week to the support traffic estimated to occur as part of the proposed delineation activities. The effects of this alternative on threatened and endangered marine mammals remain the same as those described for the Proposed Action (Section 5.2.9).

Threatened and endangered Turtles: Onshore disposal of muds and cuttings would add about 2 supply boat trips per week to the support traffic estimated to occur as part of the proposed delineation activities. The effects of this alternative on sea turtles remain the same as those described for the Proposed Action (Section 5.2.9).

Infrastructure: Onshore disposal of drilling of muds and cuttings will have a short-term impact on the number of truck trips from the Port of Hueneme. The impact of the truck trips from the Port of Hueneme will result in a 36% percent increase in truck traffic for up to 6 days. While a short-term increase in traffic is generally considered to be a moderate impact, the extremely short time periods this impact is likely to occur reduces the impact to low. Table 5.4-3 shows the number of trucks required and the daily increase in trips, and the number of days required to complete operations for each unit.

Table 5.4-3. Alternative 2 estimated number of trucks required, daily trips, percent of port traffic and the number of days required to complete operations for each unit for the Port of Hueneme.

	Total Trucks	Daily Trucks	Percent of Port of Hueneme Daily Truck Traffic	Number of Days Required
Bonito Well 1	140	72	36%	2
Bonito Well 2	140	72	36%	2
Point Sal	410	72	36%	6
Purisima Point	410	72	36%	6
Gato Canyon	210	72	36%	3

5.5 ALTERNATIVE 3 — NO ACTION

Alternative 3 would result in no delineation drilling on the four units. The opportunity for development could be precluded. However, it is important to note that no action could occur under 3 different scenarios. First, MMS reviews the revisions to the EP's and disapproves the plans based on the OCSLA and MMS regulatory requirements: because of probable serious harm or damage to life (including fish and other aquatic life), property, natural resources offshore including mineral deposits, the national security or defense, or the marine, coastal, or human environment, and the proposed activity cannot be modified to avoid the harm (OCSLA Section 5 (a) (2) (A) (i) & MMS regulations 30CFR 250.203 (i) (3)). If the revisions are disapproved, no further activity will occur unless MMS changes its determination that probable serious harm will occur. For example, unanticipated advances in technology may allow some activities to continue without probable serious harm. This would constitute a new Proposed Action and would receive full NEPA, safety and operational analysis. Second, MMS approves the plan but the operator decides not to drill. Third, MMS reviews the revisions to the EP's and requires modifications. The applicant may decide not to pursue the Proposed Action. As a result of the No Action, the 4 - 5 delineation wells do not get drilled. The applicant could legally submit development plans proposing activities to recover the resources; however, this would be more difficult without the information from delineation wells. A new development plan would undergo full NEPA, safety and operational analysis prior to a decision being made to allow the activity to proceed.

Effects of Alternative 3: If Alternative 3 is selected, all impacts, associated with the Proposed Action would be eliminated. This alternative would therefore result in no effect on the resources and activities discussed in Section 5.2. The incremental contribution of the Proposed Action to cumulative effects would also be foregone, but effects from other activities, including other OCS activities, would remain. If the operators make a decision to pursue development, each operator would submit a separate Development and Production Plan (DPP) to the MMS. The DPP(s) would be subject to full review and public coordination under the NEPA, the OCS Lands Act, and all other required Federal, State, and local laws and regulations. Therefore, the impacts due to the Proposed Action (Delineation Drilling) would not occur but the impacts due to potential development could occur.

The potential oil and natural gas resources from the Proposed Action could remain undeveloped. Strategies that could provide replacement resources for lost domestic OCS oil and gas production include a combination of energy conservation; onshore domestic oil and gas supplies; alternative energy sources; and im-

ports of oil, natural gas, and liquefied natural gas. These alternatives, except conservation, may have environmental impacts of their own. Market forces are assumed to be the predominant factor in determining substitutes for OCS oil and gas. Based on this, increased imports of foreign oil are assumed to be the largest replacement source. This is thoroughly analyzed in the Final EIS prepared by the Minerals Management Service for the Department of Interior's 5 year *Outer Continental Shelf Oil and Gas Leasing Program: 1997-2002*. In the event import tankers are substituted, the probability of a large spill associated with import tankering could increase.

5.6 UNAVOIDABLE ADVERSE IMPACTS OF THE PROPOSED ACTION

The short-term uses of the environment considered in this Draft EIS from delineation drilling activities are compatible with the maintenance of long-term productivity. Unavoidable adverse impacts are anticipated to be primarily short-term and localized in nature.

AIR QUALITY

Unavoidable adverse impacts to air quality could occur onshore adjacent to the delineation drilling locations and along the route of support vessels. Increased NOx and SO2 emissions from exploratory drilling operations on the semi-submersible drilling rig will be minimized through the application of the following emission control measures on the main engines; 4 degree injection timing retard, turbo-charging, enhanced inter-cooling with seawater, and low sulfur diesel fuel (# 0.05 wt.%S). The crew and supply boats supporting the exploratory drilling activities will utilize the same control measures as are planned for the drilling rig. Additionally, the support vessels will limit their cruising speed to 80 percent of full power.

Water Quality

Unavoidable adverse impacts to water quality would occur at and near the sites of drilling activities. Anchoring and drilling activities would cause an increase in the turbidity of the affected waters for the duration of the activity. A turbidity plume would also be created by the discharge of drill mud and cuttings. Mud and cuttings discharges result in changes to standard, measurable water quality parameters. The changes will be transient and temporary, and limited to between 100 and 5,000 m from the discharge point affecting water quality in the immediate vicinity of the drilling unit. The discharge of treated sewage from

the drilling unit would increase the levels of suspended solids, nutrients, chlorine, and BOD in a small area near the discharge point for a short period of time.

SEAFLOOR RESOURCES

Unavoidable adverse impacts to seafloor resources, soft-bottom and hard-substrate communities, would occur at and near the sites of drilling activity from anchoring and mud and cuttings discharges.

SOFT-BOTTOM: Physical disturbances to soft-bottom habitat results from placement and removal of the drillplate, the physical drilling of a hole in the substrate, and placement and removal of anchors and associated chains and cause temporary changes in species abundance or composition. Drill mud and cuttings smother soft bottom habitat in a concentrated area under a well site result in sediment grain size changes and resultant changes in species composition.

HARD-SUBSTRATE: Physical disturbances on hard-substrate could include changes in species composition and community structure by altering the natural composition of the substrate, i.e. breaking the larger rocks into smaller pieces which could be recolonized by different species. Anchors and their chains, if placed in high relief hard substrate habitat, can crush or smother long-lived animals over the localized area contacted. Any biological effects due to the drilling muds were related to physical effects of smothering and are limited to within 1 km of the discharge source. Drill cuttings would cause localized smothering if the wellsite is located immediately adjacent to a hard substrate. Avoidance mitigation measures could reduce impacts to both hard-substrate and soft-bottom communities.

FISH RESOURCES

Unavoidable adverse impacts to fish resources would occur during well abandonment from explosive removal of the wellhead. A small number of fish would be expected to be lost. However, given the short duration of the project, few fish would be expected to be attracted to the wellhead and a low mortality is expected. The use of explosives for well abandonment would require the implementation of a wildlife mitigation plan designed to minimize impacts to marine life. Typically, such a plan has included the use of shipboard observers who would be charged with collecting injured or dead fish after the detonation. The detonation could also be postponed if the diver setting the charge reports an appreciable number of fish over the wellhead.

MARINE MAMMALS

Unavoidable adverse impacts to marine mammals would occur during drilling, vessel and helicopter support activities, and well abandonment from explosive removal of the wellhead. Impacts on marine mammals from drilling noise are expected to be restricted to minor, temporary (less than 1-hour) disturbances within approximately 100 m of the drilling rig. Noise from drilling activities will last less than 2 months at each well location.

The level of support vessel and barge traffic associated with the proposed exploratory activities is expected to result in temporary (less than 1-hour), localized disturbances to some marine mammals, primarily baleen whales. Collisions between support vessels and marine mammals, while possible, are considered to be highly unlikely events. Helicopter traffic is expected to result in temporary (less than 1-hour), localized disturbances to some marine mammals.

A marine mammal close to the detonation site potentially could be injured or killed, or suffer permanent or temporary hearing damage. Some disturbance of marine mammals present in the vicinity of the detonation area could also occur, but these would be expected to be minor and temporary (less than 1 hour in duration). Impacts could be reduced through the implementation of a wildlife mitigation plan designed to minimize impacts on marine mammals and other marine animals.

THREATENED AND ENDANGERED SPECIES

Unavoidable adverse impacts to threatened and endangered species and blue and humpback whales could occur during drilling, vessel and helicopter support activities, and well abandonment from explosive removal of the wellhead. Impacts on blue and humpback whales from drilling noise are expected to be restricted to minor, temporary (less than 1-hour) disturbances within approximately 100 m of the drilling rig. Noise from drilling activities will last less than 2 months at each well location. The level of support vessel and barge traffic associated with the proposed exploratory activities could result in temporary (less than 1-hour), localized disturbances to blue and humpback whales. Surface traffic to and from the proposed project areas is unlikely to have a detectable effect on blue and humpback whales during their summer and fall presence in southern California waters. Helicopter traffic is expected to result in temporary (less than 1-hour), localized disturbances to blue and humpback whales. Blue or humpback whales close to the detonation site for well abandonment activities potentially could be injured or killed, or suffer permanent or temporary hearing damage. Some disturbance of blue and humpback whales present in the vicinity of the deto-

nation area could also occur, but these would be expected to be minor and temporary (less than 1 hour in duration). Impacts could be reduced through the implementation of a wildlife mitigation plan designed to minimize impacts on blue and humpback whales and other marine animals.

VISUAL RESOURCES

Unavoidable adverse impacts to visual resources could occur during drilling operations. The effect of the proposed action on visual resources is not significant on any of the four Units. The Visual Resource Impact Area (VRIA) from the Gato Canyon Unit drill site crosses the shoreline for a short distance in the vicinity of El Capitan State Beach. However, the VRIA is outside the boundary of El Capitan State Beach.

MARINE RECREATIONAL FISHING

Unavoidable adverse impacts to marine recreational fishing could occur during drilling operations. Vessels trolling for pelagic species would be expected to avoid an area up to 1,525 m (5,000 ft) around the proposed well sites while the MODU is on site. An increase in navigational hazards to marine recreational fishermen would be expected due to increased vessel traffic associated with the proposed project.

COMMERCIAL FISHING AND KELP HARVEST

Unavoidable adverse impacts to commercail fishing could occur during drilling operations. Fishing conflicts, lost fishing time and damage to equipment, with fishing could occur as the MODU is towed to each of the well sites. Fishing conflicts may also occur as crewboats and supply boats travel to and from the drill site. Fishermen of all gear types would be precluded from fishing in the vicinity of the MODU for up to 90 days at each well site. The trawl fishery may also experience long-term impacts due to artificial obstructions, such as drill mud and cuttings, anchor scars, and lost debris. Impacts to fishermen would have indirect impacts to the rest of the industry including seafood processors, brokerage firms, dock workers, shipping and boat yards.

Industry proposes, or plans to negotiate, the following mitigation measures; 1) transit to and from drilling sites will occur within vessel corridors established for oil and gas service vessels in the SMB and SBC, 2) consultation with fishermen and fishing organizations concerning drilling activities, 3) notification to fishermen and fishing organizations of drilling activities compensation for preclusion of fishing, 4) identify and arrange for relocation of gear within

anchor scope prior to arrival of the MODU, 5) industry and boat captains associated with the proposed project will keep logs documenting equipment lost overboard. Industry will notify MMS of all lost items, 6) all offshore personnel involved in the proposed project to attend the Western States Petroleum Association's Fisheries Training Program, appropriately abridged, and 7) industry will hold at least two pre-survey coordination meetings with MMS and other interested agencies to review the status of the implementation of these mitigation measures.

INFRASTRUCTURE

Unavoidable adverse impacts to infrastructure would occur during drilling operations. Crew and supply vessels trips are anticipated to increase as a result of the proposal resulting in a small short-term increase in supply vessel.

5.7 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

In this section, the short-term effects and uses of various components of the environment in the vicinity of proposed drilling of 4-5 delineation wells at different locations are related to long-term effects and the maintenance and enhancement of long-term productivity. Short-term refers to the total duration of the Proposed Action, oil and gas delineation activities, whereas long-term refers to an indefinite period beyond the termination of delineation activities. The specific impacts of the Proposed Action vary in kind, intensity, and duration according to the activities occurring at any given time. Air emissions and drilling discharges result in short-term, localized impacts. Anchor scars and mud and cuttings piles last for decades and longer. Over the long-term, several decades to several hundreds of years, natural environmental balances are expected to be restored. Many of the effects discussed in Section 5 are considered to be short-term (occurring only during drilling activities). These impacts could be further reduced by the mitigative measures discussed in Section 5.

The short-term use of the leased areas is the drilling of 4-5 delineation wells at different locations. Delineation drilling activities would have air emissions, water discharges, cause disturbance to and resuspension of bottom sediments, and occupy a large area with the drill rig and anchors. Support vessels would have air emissions and routinely travel between the drill rig and port. Helicopters would have air emissions and routinely travel between the drill rig and

support bases. The short-term delineation drilling may have long-term impacts on sensitive hard substrate communities (section 5.2). Delineation drilling and support activities would also have temporary, short-term impacts to air and water quality, marine life, visual resources, marine recreational and commercial fishing, and infrastructure. After the completion of the drilling and support activities, the marine and coastal environment is generally expected to remain at or return to its normal long-term productivity levels. There have been decreases in long-term marine productivity in OCS areas where oil and gas have been produced for many years. Reductions have been observed in plankton and fish populations off the West Coast in the last 50 years which experienced exploration drilling, development and production during the 1960s, 1970s, and 1980s. McGowan et al. (1996) attributes the reduction in macrozooplankton in southern California waters to warming of the California Current since 1951. Impacts to plankton due to the Proposed Action are not expected. Anchoring and mud and cuttings discharges of the Proposed Action would alter the ocean bottom resulting in a small change in habitat for a small number of fish over a small area. Because a small number of fish and a small area would be affected, we conclude that decreases in long-term productivity are not expected as a result of the Proposed Action.

5.8 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretreivable may be confusing terms to some because they are not part of everyday language. Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long term (millions of years). The classic instance is when a species becomes extinct; this is an irreversible loss. Irretrievable commitments are those that are lost for a period of time. For example, fishermen would not be able to trawl in the same space as an MODU for as long (68-92 days) as the MODU is there. Once the MODU is removed and the site cleared of any debris, fishermen could again trawl the location where the drill rig used to be.

WATER QUALITY

Irretrievable commitments to water quality would result from resuspension of sediments during anchoring and vessel discharges; for example cooling water, sanitary and domestic wastes, deck drainage, and drilling related discharges; muds and cuttings, excess cement, and blowout preventer fluid.

AIR QUALITY

Irretrievable commitments to air quality would occur from increased NO_x and SO₂ emissions from exploratory drilling operations on the semi-submersible drilling rig, support vessels, and helicopter traffic.

SEAFLOOR RESOURCES

Irretrievable commitments to seafloor resources; soft-bottom and hard-substrate communities, would occur at and near the sites of drilling activity from smothering due to resuspension of sediments from anchoring and mud and cuttings discharges. Irreversible commitments to hard-substrate communities would occur from anchors and their chains if placed in high relief hard substrate habitat resulting in crushing or smothering long-lived animals over the localized area contacted and recolonization by other species.

FISH RESOURCES

Irretrievable commitments to fish resources would occur during well abandonment from explosive removal of the wellhead resulting in the loss of a small number of fish.

MARINE MAMMALS

Irretrievable commitments to marine mammals would occur during drilling, vessel and helicopter support activities, and well abandonment from explosive removal of the wellhead resulting in minor, temporary (less than 1-hour) disturbances within approximately 100 m of the drilling rig.

THREATENED AND ENDANGERED SPECIES

Irretrievable commitments to threatened and endangered species, blue and humpback whales, could occur during drilling, vessel and helicopter support activities, and well abandonment from explosive removal of the wellhead resulting in minor, temporary (less than 1-hour) disturbances.

VISUAL RESOURCES

Irretrievable commitments to visual resources could occur during drilling operations resulting from viewing the drill rig from shore.

MARINE RECREATIONAL FISHING

Irretrievable commitments to marine recreational fishing could occur during drilling operations resulting from preclusion of fishing around the proposed well sites and vessel conflicts with support vessel traffic.

COMMERCIAL FISHING

Irretrievable commitments to commercial fishing could occur during drilling operations resulting from lost fishing time and damage to equipment and obstructions, such as drill mud and cuttings, anchor scars, and lost debris.

INFRASTRUCTURE

Irretrievable commitments to infrastructure would occur during drilling operations from increased vessels trips.

