Enclosure 2

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

SPENT FUEL PROJECT OFFICE

ENVIRONMENTAL ASSESSMENT RELATED TO THE CONSTRUCTION AND OPERATION OF THE DIABLO CANYON INDEPENDENT SPENT FUEL STORAGE INSTALLATION

DOCKET NO. 72-26
PACIFIC GAS AND ELECTRIC COMPANY

October 2003

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ENVIRONMENTAL ASSESSMENT
FOR THE
DIABLO CANYON
INDEPENDENT SPENT FUEL STORAGE INSTALLATION

1.0 INTRODUCTION

1.1 Description of the Proposed Action

By letter dated December 21, 2001, Pacific Gas and Electric Company (PG&E) submitted an application to the U.S. Nuclear Regulatory Commission (NRC), requesting a site-specific license to build and operate an Independent Spent Fuel Storage Installation (ISFSI), to be located on the site of the Diablo Canyon Power Plant (DCPP), in San Luis Obispo County, California. Supplemental information was submitted by PG&E in letters dated October 15, 2002, and February 7, February 14, March 27, May 6, June 13 and July 28, 2003, in response to a request for additional information from NRC staff, which was issued on August 29, 2002.

This Environmental Assessment (EA) is being prepared in accordance with NRC requirements in 10 CFR 51.21 and 51.30, and with the associated guidance in NRC report NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs." An EA is defined by the Council on Environmental Quality in 40 CFR 1508.9 as a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

A holder of an NRC license for a power reactor under 10 CFR Part 50 can construct and operate an ISFSI at that power reactor site under the general license provisions of 10 CFR Part 72, or may apply for a separate site-specific license. PG&E has applied for a site-specific license for the proposed Diablo Canyon ISFSI in accordance with the applicable regulations in 10 CFR Part 72.

1.2 Previous Environmental Assessments and Supporting Documents

Documents evaluated in the preparation of this EA include: "Diablo Canyon Independent Spent Fuel Storage Installation Safety Analysis Report and Environmental Report," PG&E, December 2001, and Amendment 1, October 2002; "Final Environmental Statement related to the Nuclear Generating Station, Diablo Canyon, Units 1 & 2," U.S. Atomic Energy Commission, May 1973; "Final Generic Environmental Impact Statement on Handling and Storage of Spent Light-Water Power Reactor Fuel," NUREG-0575, U.S. Nuclear Regulatory Commission, August 1979; and, "Holtec International HI-STORM 100 Cask System Amendment 1 Safety Evaluation Report," NRC, July 2002.

Additional references may be found in Section 10.0 of this EA.

1.3 Purpose and Need for the Proposed Action

The Diablo Canyon ISFSI is needed to provide additional spent fuel storage capacity so that the two DCPP reactors can continue to generate electricity beyond 2006, when the storage capacity of the spent fuel pools will be reached. By providing additional temporary spent fuel

storage with the proposed ISFSI, sufficient space can be maintained in each unit's spent fuel pool to fully off-load its reactor core, if necessary, enabling PG&E to operate both units until the current operating licenses expire (September 2021 for Unit 1 and April 2025 for Unit 2).

DCPP is owned and operated by PG&E. DCPP consists of two nearly identical Westinghouse-type pressurized water reactors (PWR) and is located approximately 6 miles northwest of Avila Beach, CA, on approximately 760 acres in San Luis Obispo County. The units are each rated at a nominal 1,100 Megawatts-electric and each unit has its own spent fuel storage pool.

Unit 1 began commercial operation in May 1985 and its current operating license will expire in September 2021. Unit 2 began commercial operation in March 1986, and its current operating license will expire in April 2025.

The spent fuel storage pool for each reactor was initially equipped with low-density spent fuel storage racks which could only hold approximately 257 fuel assemblies. In the late 1980s, the low-density racks were replaced with high-density racks which significantly increased the storage capacity of the pools. Re-racking the two spent fuel pools with the high-density racks increased the storage capacity of each pool to 1,324 spent fuel assemblies.

Each reactor core contains 193 fuel assemblies. Both reactors are operating on refueling cycles of 18 to 21 months. At each refueling, 76 to 96 fuel assemblies are permanently removed from the core. Based on the existing inventory of spent fuel assemblies in the fuel pools and the projected number of assemblies to be removed from the reactor cores after each operating cycle, there is sufficient space in each fuel pool to accommodate the expected number of spent fuel assemblies and an additional full core of irradiated fuel until 2006. After that time, both units at DCPP will lose the ability to fully off-load the reactor cores. The DCPP Final Safety Analysis Report (FSAR) discusses PG&E's operating requirement for the two units to maintain the ability to fully off-load their reactor cores to their spent fuel pools.

2.0 THE PROPOSED ACTION

The proposed action is for PG&E to build, operate and decommission an ISFSI at the DCPP site. The ISFSI will provide sufficient temporary dry storage capacity, as needed, for the spent nuclear fuel currently stored in the DCPP spent fuel pools, and for all of the spent nuclear fuel to be produced by the two units for the duration of their current operating licenses.

2.1 Description of Proposed ISFSI and Dry Cask Storage System

PG&E has chosen the HI-STORM 100 dry cask storage system manufactured by Holtec International to store the spent fuel and associated non-fuel hardware from the DCPP. The HI-STORM 100 system has been certified for general use by the NRC. The actual system to be used at Diablo Canyon is a version of the HI-STORM 100 that uses HI-STORM 100SA storage overpacks, which are slightly shorter than those for the standard design and are anchored to the concrete pad. The amendment to the HI-STORM 100 system to incorporate the HI-STORM 100SA overpack design was approved by the NRC in July 2002 for use under the general license provisions of 10 CFR Part 72.

The HI-STORM 100 system consists of the multi-purpose canisters (MPCs), concrete storage overpacks, and the HI-TRAC 125 transfer cask. The MPC, which provides for the confinement

of radioactive materials, is a totally welded cylindrical stainless steel structure with flat ends. It is designed to have the structural capability to withstand the loads created by the design basis accidents and natural phenomena. The MPC consists of a honeycomb fuel basket, baseplate, shell, lid, vent and drain port cover plates, and a closure ring.

A damaged fuel container (DFC) is also used, as needed, to contain fuel assemblies classified as damaged fuel and fuel debris. The DFC contains such material in a retrievable configuration. The DFC is a long, square, stainless steel container with screened openings at the top and bottom. After the damaged assembly or debris is loaded into the DFC, it is inserted into a designated cell within the MPC. The total quantity of fuel debris allowed in one DFC is limited to the equivalent weight and material quantity of one intact fuel assembly.

The HI-STORM 100SA overpack is a cylindrical, steel and concrete structure, which is made up of inner and outer concentric carbon steel shells, baseplate, and a bolted lid. The lid is made up of steel top plates and a concrete shield. Concrete fills the 30 inches between the inner and outer carbon steel shells and provides radiation shielding. The HI-STORM 100SA has been designed for use in high seismic areas and can be anchored to the storage pad.

The overpack is designed for natural circulation of air in the annulus between the MPC and overpack to provide passive cooling of the spent fuel in the MPC. Ambient air enters the four air inlet vents in the base of the overpack located at 90-degree spacing and the heated air exits the four air outlet vents located in the top lid of the overpack.

The HI-TRAC 125 transfer cask provides shielding and structural support for the MPC during loading, unloading, and transfer of the MPC from the spent fuel pool to the cask transfer facility (CTF). The transfer cask is cylindrical and is made of inner and outer concentric steel shells, a bolted pool lid, a top lid, and an outer water jacket which surrounds the cask. Lead fills the annulus between the inner and outer steel shells. The steel and lead provide shielding of gamma radiation. The water jacket provides shielding of the neutron radiation.

The Diablo Canyon ISFSI will be located 0.22 miles northeast of the DCPP Unit 1 reactor. The storage casks (loaded MPCs in overpacks) will be placed on concrete pads. The ISFSI will be designed to hold up to 140 storage casks (138 loaded casks plus two spare locations). This total capacity was calculated to provide sufficient dry storage for all of the spent fuel produced from the operation of Diablo Canyon Units 1 and 2 through the expiration of both units' current operating licenses, including the spent fuel currently stored in the spent fuel pools. From the dates of initial operation until the current licenses expire in 2021 and 2025, approximately 4400 spent fuel assemblies will be produced by the two units. Each MPC is designed to store a maximum of 32 spent fuel assemblies; therefore a total of 138 storage casks would be needed, if all the Diablo Canyon spent fuel is eventually placed into the ISFSI.

Two concrete storage pads will be built as part of the original construction. The remaining five pads will be built as needed. Each concrete pad will hold up to 20 storage casks in a 4 by 5 array. Casks will be placed about 6 feet apart on the pad to facilitate maintenance and inspection activities.

Each concrete pad will be approximately 68 feet wide by 105 feet long and 7.5 feet thick with reinforcing bars imbedded in the concrete. The seven storage pads will cover an area approximately 500 feet by 105 feet. For each concrete overpack to be placed on the pad, there

will be an embedded steel structure with a steel plate ring on the concrete's surface. The bottom of the overpack is matched to the steel plate ring and then the overpack is secured to the concrete pad by 16 studs.

A locked and gated security fence will be built around the storage pads. There will be a minimum distance of 50 feet between the casks and the fence on the north side of the ISFSI and a minimum distance of 40 feet between the security fence and the other three sides. A second fence, surrounding the security fence, will be built 100 feet from the storage casks and is the boundary for the ISFSI restricted area.

The CTF will be located approximately 100 feet from the storage pads. It will be a cylindrical, steel-lined concrete support structure embedded in rock below grade. It will be made up of steel-reinforced concrete slabs and walls and will house the lift platform and associated mechanical equipment. There will be a sump and a channel to accommodate a temporary, drop-in sump pump to remove any water which might accumulate. When the facility is not in use, it will be covered to protect the structure from the environment and for personnel safety.

2.2 Identification of Planned Activities

PG&E has identified three phases to the Diablo Canyon ISFSI project. The three phases are construction, operation, and decommissioning.

2.2.1 Construction

The construction phase will consist of the excavation of approximately 120,000 cubic yards of material; the construction of the first two of seven concrete storage pads, the cask transfer facility and the ISFSI access road; and the rerouting of approximately 1000 feet of an existing road around the raw water reservoir. The first two pads will be constructed, and the area to be occupied by the other concrete pads will be temporarily filled with sand or aggregate. The remaining five concrete construction pads will be built at PG&E's discretion to meet DCPP's ongoing interim spent fuel storage needs.

During construction of the storage pads, approximately 4-5 acres of land at the ISFSI site will be impacted. Ground vegetation will be removed and soil will be excavated by using large earthmoving equipment. No blasting is expected to take place during the construction phase. Excavated material will be deposited at any of three on-site locations: at the site of the temporary concrete batch plant, or at existing Parking Lots 1 or 7. All three of these locations have been previously disturbed during plant-related construction.

A temporary concrete batch plant will be built on-site to provide concrete for the ISFSI pads. The concrete batch plant will be located approximately 500 feet east of the ISFSI pad on previously disturbed land between the 230kV and 500kV switchyards. Lighting, communication equipment, security fences, drainage, and the security system for the ISFSI will also be installed during the construction phase. Construction of the CTF will include excavating ground for the embedded lift system, pouring concrete for the lift system and approach ramps, and installing mechanical equipment.

2.2.2 Operation

The second phase of the project involves the routine operation of the facility, which includes pre-operational testing. The HI-STORM 100 system will be used to load, transfer, and store DCPP spent fuel. The system consists of multi-purpose canisters, HI-STORM 100SA storage overpacks, and the HI-TRAC transfer cask.

Before any fuel is moved from the spent fuel pools for placement on the ISFSI storage pad, pre-operational and start-up testing of the equipment and facility will be performed. The pre-operational tests will be performed on the CTF, the transporter, and all ancillary storage system components, such as automated welding machines and vacuum drying equipment. The start-up testing plan will be used to verify that the performance of the storage system meets the functional requirements identified in the ISFSI Safety Analysis Report. Mock-ups and actual plant equipment will be used during start-up activities.

Spent fuel assemblies will be loaded into each MPC in the DCPP fuel handling buildings. The HI-TRAC transfer cask is used to transfer the MPC from the fuel handling building to the CTF. The MPC is then transferred from the HI-TRAC cask to a HI-STORM 100SA storage overpack at the CTF. The loaded overpack is then placed in its storage location on the ISFSI pad. The overpack provides physical protection, cooling, and radiation shielding for the MPC while in storage. Maintenance activities, health physics surveys, and security surveillance of the storage casks will be conducted as required by ISFSI technical specifications and procedures.

2.2.3 Decommissioning

The third and final phase of the Diablo Canyon ISFSI project will be the decommissioning of the facility. Decommissioning activities will not occur until after the spent fuel has been moved from the ISFSI to a permanent repository, or to another interim storage facility off site. The NRC may issue a license for an ISFSI for a period not to exceed 20 years, in accordance with 10 CFR 72.42, which also provides the opportunity for a licensee to request renewal of that license. Decommissioning activities for the ISFSI will be initiated following the removal of all MPCs from their concrete overpacks and their shipment offsite in appropriate transportation casks. These activities will include decontaminating the concrete overpacks, as necessary, surveying the ISFSI site for residual radiation, and disposing of the concrete overpacks and concrete pads as appropriate.

2.3 Location of Proposed Action

The DCPP site is located approximately 6 miles northwest of Avila Beach, California, in San Luis Obispo County, on approximately 760 acres adjacent to the Pacific Ocean and directly southeast of Montana de Oro State Park. The facility is located approximately 12 miles west-southwest of the city of San Luis Obispo, which is the county seat and nearest large population center. The ISFSI will be located within the PG&E owner-controlled area at the Diablo Canyon site and is approximately 0.22 miles northeast and uphill from the Unit 1 reactor. The seven ISFSI pads will occupy an area of approximately 1.2 acres. The ISFSI will cover a total area of approximately 4-5 acres, with the required security fences in place around the pads.

2.4 Duration of Proposed Action

The duration of the proposed action will be for 20 years, the maximum term for an initial ISFSI license, as specified in 10 CFR 72.42, plus an additional period of up to several years for decommissioning. Decommissioning of the ISFSI could commence prior to the license expiration date, but in any case, it will not begin until after the spent fuel being stored in the ISFSI is transferred to a permanent disposal facility, or to another offsite interim storage facility. At the end of the 20-year license period, a licensee may request renewal of its ISFSI license for up to another 20 years, subject to further NRC review and approval.

3.0 ALTERNATIVES TO THE PROPOSED ACTION

3.1 No Action Alternative

The no action alternative means that PG&E would continue to operate the DCPP as usual. However, by the year 2006, the capacity of the spent fuel pools would be reached, and PG&E would no longer have the capability to fully off-load the reactor cores of each unit, if necessary. With this alternative, there would be no impact to the site, as the ISFSI would not be constructed. The environmental impact to the site would remain the same as long as the facility continued operation. Once the spent fuel pools reached their maximum capacity, the reactors would have to be shut down, many years before the expiration date of their operating licenses. The electrical generation capacity lost would have to be replaced by another source of power. The two operating nuclear power stations in California generate approximately 14 percent of the electricity used in the state. Shutdown of the DCPP could negatively impact the local economy and infrastructure of the area. Development of near and long-term replacement power sources would likely involve the use of fossil fuels, which could result in greater environmental impact and higher electricity rates for customers. For these reasons, the “no action” alternative is not considered a practical alternative.

3.2 Siting Alternatives

PG&E evaluated several different locations on the DCPP site for the ISFSI. However, several of these were eliminated during the screening process, as they were determined to be too near coastal waters, too near Diablo Creek, vulnerable to a potential landslide, and/or of insufficient area to support the ISFSI.

Based upon its initial screening, PG&E determined that six sites within the owner-controlled area warranted further evaluation. The six sites considered were the Tower Site, the Water Tank Site, Parking Lot 7, Parking Lot 8, the Firing Range, and the Borrow Site. PG&E developed criteria to evaluate these sites. The criteria consisted of area requirements, geological/geotechnical requirements, transportation access, effect on existing site facilities, operational impacts, environmental impacts, and cost impacts.

The Borrow Site was determined to best meet the evaluation criteria and was therefore chosen as the preferred site. The Borrow Site is underlain with dolomitic sandstone bedrock similar in composition, rock mass character, and seismic wave velocity to the bedrock underneath the DCPP power block. This site has been previously disturbed during the construction of the DCPP site. Also, PG&E determined that by rerouting Reservoir Road, the proposed ISFSI site could be moved closer to the raw water reservoir, resulting in a significant reduction in the

amount of material to be excavated. Very little of the ISFSI site will be visible from the ocean or coastal terraces.

The remaining sites were determined to be less desirable locations for the ISFSI, primarily due to the nature of the bedrock underlying these sites. The Tower site would also require extensive grading, drainage and slope stabilization, in addition to developing an access road which would be over one mile long. The Water Tank Site was eliminated due to the presence of steep slopes and potential landslides. Parking Lot 7, Parking Lot 8, and the Firing Range sites are clustered together and lie on thick terrace and debris-flow fan deposits that would require extensive grading. These sites also have the potential for small debris flows which would have to be mitigated in order to construct the ISFSI at any of these three locations.

3.3 Design Alternatives

PG&E considered several design alternatives to obtain additional spent fuel storage capacity. These included increasing the capacity of the existing spent fuel pools by re-racking or spent fuel rod consolidation, construction of a new storage pool, and offsite shipment to a permanent Federal Repository, a reprocessing facility, a privately owned ISFSI, or another nuclear power plant. The alternatives of shipping spent fuel from Diablo Canyon to a permanent Federal Repository, to a reprocessing facility, or to a privately owned spent fuel storage facility were determined to be non-viable alternatives, as no such facilities are currently available in the United States. Although reprocessing facilities exist in other countries, the political, legal, and logistical uncertainties and the high cost of shipping spent fuel overseas also made these alternatives not viable. Therefore, these alternatives were not considered further. Shipping the DCPP spent fuel to another nuclear power plant was also determined to be a non-viable alternative, because the receiving utility would have to be licensed to accept the DCPP spent fuel and would have to be willing to accept the fuel. Most nuclear power plant operators are expected to face their own limitations on spent fuel storage capacity and it is unlikely that they would be willing to accept spent fuel owned by another company.

3.3.1 Re-racking

PG&E evaluated the alternative of re-racking the spent fuel pools with higher density fuel racks and, although viable, considers it to be a less-preferred method. Replacing the high-density fuel racks currently in use with more densely configured racks could provide sufficient storage for all spent fuel from Unit 1 through the end of its operating license in 2021. However, there would not be sufficient room to store all the spent fuel generated from Unit 2 operation through the end of its operating license in 2025. Also, the more densely configured fuel racks could require modifications to both spent fuel pools to increase the cooling capacity of the pool cooling systems to accommodate the increased heat load. Since re-racking would not allow for storage of all fuel produced by the two units through the end of the current operating licenses, and significant modifications to both spent fuel pools could be necessary, this is not considered a practical alternative.

3.3.2 Rod Consolidation

PG&E also considered consolidating spent fuel rods, but determined that consolidation is not a viable alternative. This alternative involves removing all the fuel rods from two fuel assemblies and then placing all the rods in a closely packed array and then placing them in a canister the

same size as the original fuel assembly. The canister is stored in the spent fuel rack in one of the positions formerly occupied by the original assembly. The remaining fuel assembly skeletons are compacted and stored in another canister. This method of fuel consolidation would result in ten fuel assemblies being consolidated into five canisters of fuel and one canister of skeletons. The consolidated fuel canisters have a much higher mass of fuel and due to high seismic design requirements at DCPP, the current fuel racks are not designed to accommodate the greater weight. This alternative requires extensive operational resources and would result in an increase in occupational exposures. Due to these considerations, rod consolidation is not a viable alternative.

3.3.3 Building a New Storage Pool

PG&E evaluated the alternative of building a new storage pool and support facilities separate from the existing two spent fuel pools. In addition to requiring the same support facilities, maintenance and surveillance as the old fuel pools, a new storage pool would require new fuel handling equipment, a large capacity cask crane, building ventilation, and a water quality system. The older fuel would be moved from the current fuel pools to the new pool and would require some type of dry cask transfer system to safely move the fuel. This alternative increases the number of times a fuel assembly is handled and, consequently, the occupational exposure to the workers. The additional maintenance and surveillance activities to support operation of the new pool would also result in higher worker exposures. This alternative also has a high cost, due to construction of the new pool and facilities, and for the dry cask system needed to transfer the fuel. For these reasons, building a new fuel pool was not considered a practical alternative.

PG&E evaluated proposals from four different vendors of spent fuel dry cask storage systems. Criteria used to evaluate the different storage systems included compatibility with the proposed site; potential radiation exposure; effects of postulated off-normal events, regulatory compliance and licensing issues; cost and other commercial considerations; and the engineering/licensing capability of the vendor. Based on these criteria, PG&E selected Holtec International's HI-STORM 100 system, which incorporates a design for high-seismic areas and provides a system to anchor each storage cask to the concrete storage pad.

4.0 AFFECTED ENVIRONMENT

4.1 Proposed ISFSI Site Description

The PG&E owner-controlled area occupies a coastal terrace that ranges in elevation from 60 to 1,400 feet above mean sea level (MSL). Other than the intake and discharge structures, the DCPP facilities range from 60 to 150 feet MSL. The ISFSI will be located approximately 0.22 miles northeast of the Unit 1 containment at an elevation of approximately 310 feet MSL. The seaward edge of the coastal terrace is a near-vertical cliff. Back from the terrace and extending for several miles are the Irish Hills, an area of steep, brush-covered hillsides and deep canyons that are part of the San Luis Mountains. The San Luis Mountains reach an elevation of 1,500 feet MSL within approximately one mile of the site. The ISFSI will be located between hillsides that are on top of bedrock.

PG&E has developed a best management practices (BMP) fuel management program to control the wildland vegetation of the Diablo Creek watershed and protect the power plant site,

transmission lines, and workforce population from wildfire. The wildland fuel management area is located east of the proposed ISFSI site within the Diablo Creek watershed. Controlled burning, brush clearing, controlled grazing, and selective application of herbicides are used to manage fuels within the watershed. Approximately 400 acres of the Diablo Creek watershed is actively managed using these integrated vegetation management practices to reduce the volume of fuel in the watershed and to reduce the hazard to utility personnel and structures from fire.

4.2 Land Use

San Luis Obispo County covers over 3,300 square miles and is situated between the Los Padres National Forest to the south and the Santa Lucia Mountain range to the north. Eighty miles of Pacific Ocean coastline border the western county.

The San Luis Range, which reaches a maximum elevation of 1,800 feet, dominates the area between the site and U.S. Highway 101. This is hilly terrain and is used to a minor extent for grazing beef cattle and to an even lesser extent, dairy cattle. The Santa Lucia Mountains comprise the terrain east of U.S. Highway 101; this area is mostly inaccessible and sparsely populated. A large portion of this area lies within the Los Padres National Forest.

Farming is a significant land use in the county; the principal crops are wine grapes, vegetables, cattle, nurseries, fruits, nuts, and grains. The total acreage of San Luis Obispo County is 2,128,640 acres. Farm acreage in the county is approximately 1,200,00 acres. There are several vineyards and wineries in the county. Wine grapes account for approximately 28 percent of the top twenty value crops in the county. The fruit and nut crop industries had an estimated value of $182 million in 2001, with wine grapes accounting for $138 million.

In the immediate vicinity of the DCPP and the ISFSI site, the only agricultural activities conducted take place on lands leased from PG&E. These activities consist of cattle grazing, on much of the area surrounding the site, and the farming of legumes and grains, which takes place on a single farm in the east-southeast sector of the PG&E-owned property. The farm is located along the site access road on the coastal plateau, approximately 2 miles from the plant and extends for 2.5 miles. The only dairy farm operation is located 12 miles northeast of the site at California Polytechnic State University in San Luis Obispo. This farm produces approximately 1,200 gallons of milk per day.

The PG&E owner-controlled area is located between two fishing harbors that support commercial and sport fishing, Port San Luis Harbor, 6 miles down-coast, and Morro Bay Harbor, 10 miles up-coast. Port San Luis Harbor is located at Avila Beach, across from the security road entrance that controls entry to the owner-controlled area. There is a small public beach located next to the harbor which is used for recreational purposes.

Albacore, cabezon, sole, ocean shrimp, spot prawn, rockfish, salmon, and swordfish are among the variety of fish harvested by commercial fisherman from Morro Bay. In 2000, approximately 2.5 million pounds of fish with a value of $4.4 million were harvested.

In Avila Beach, there is a public beach and pier that is used by both residents and tourists. Attendance at the beach fluctuates depending upon the season. Across from the beach is a

resort hotel/condominium complex with a golf course. Several residential developments are located nearby.

Industry in the area surrounding the DCPP and ISFSI site is primarily light industry and serves the agricultural needs of the area. Food processing and crude oil refining are the major industries but do not employ large numbers of people. Manufacturing accounts for less than eight percent of the work force in the area. Vandenberg Air Force Base, located approximately 35 miles south-southeast of the site in Santa Barbara County is the largest industrial complex in the area. Other businesses and institutions in the area include various medical facilities, a state correctional facility located north of the city of San Luis Obispo beside U.S. Highway 1, and numerous tourist-related businesses. The local tourist industry mainly involves beach-related activities.

4.3 Demography

The area within 50 miles of the DCPP (and the proposed ISFSI) site includes most of San Luis Obispo County, portions of Santa Barbara County, and a small area of Monterey County. Approximately 55 percent of the area within the 50-mile radius is on land; the remaining portion is part of the Pacific Ocean. Based on 2000 U.S. Census information, the approximate population within the 50-mile radius of the site is 424,000, and the population within 10 miles of the site is approximately 23,700. The city of San Luis Obispo is the nearest population center. The nearest boundary of the city is approximately 10 miles east-northeast of the site. Its population is approximately 44,000 based on the 2000 census. The nearest residence is 1.5 miles north-northwest of the ISFSI site and is occupied by two persons. Within 5 miles of the site, there are four residences with an approximate population of 14 people.

Directly to the north of the site is Montana de Oro State Park. The estimated daytime population during the periods of heaviest use is approximately 5000. Overnight use during this same period is estimated to be 400.

No schools are located within 5 miles of the site. Several elementary schools are located within 10 miles of the site; near Los Osos, approximately 8 miles north of the site, and Avila Beach, approximately 6 miles southeast of the site. Cuesta College is located 10 miles northeast of the site and has an enrollment of approximately 10,000. California Polytechnic State University is located 12 miles north-northwest of the site and has an enrollment of approximately 17,000.

In the 50-mile radius of the site, there is a seasonal influx of vacation and weekend visitors, especially during the summer months. The influx is heaviest to the south along the coast from Avila Beach to south of Oceano. August is usually the month with the heaviest influx, with an approximate overnight population of 100,000 people staying in motels and state parks.

4.4 Climatology and Meteorology

The climatology and meteorology of the site have been well-documented during the years DCPP has been operating. There is an on-site meteorological monitoring system supporting DCPP operations. The system consists of two independent subsystems that measure real-time meteorological conditions and then process the information. There is also a supplemental meteorological measurement system located in the vicinity of DCPP. The supplemental system consists of two Doppler acoustic sounders and six tower sites. The supplemental

meteorological system provides data which are used for emergency response activities and which would be used to track the movement of any radioactive plume resulting from an emergency.

In general, the area experiences a Mediterranean-like climate year-round, averaging 315 days of sunshine per year. The rainy season generally falls between the months of October and April. The average annual rainfall in the San Luis Obispo area is 21.5 inches. The maximum recorded annual rainfall in San Luis Obispo was 54.53 inches in 1969. The prevailing wind direction is from the northwest and the annual average wind speed is 10 mph. The dry season is from May to September.

Since the proposed ISFSI location is only 0.22 miles north of the Unit 1 reactor (with the Unit 2 reactor roughly 200 feet from Unit 1), the meteorology and climatology of the ISFSI site are the same as for the two DCPP units. The annual average temperature in this area is approximately 55°F, with the coldest weather occurring in December and the warmest in October. The annual mean number of days with severe weather such as tornadoes or ice storms is zero. Thunderstorms and hail occur at an annual average of less than three days per year. Average annual precipitation at the DCPP site is approximately 16 inches.

4.5 Hydrology

The hydrology of the site has been well documented in the DCPP FSAR. The hydrological conditions for the ISFSI are similar to those for the nearby DCPP site. The hydrological characteristics of the site are influenced by the Pacific Ocean on the west and the local storm runoff collected by the Diablo Creek watershed.

The main source of potable water for the city of San Luis Obispo is from the Salinas Reservoir located approximately 23 miles east-northeast of the ISFSI site. Other sources of potable water are Whale Rock Reservoir on Old Creek, 17 miles north of the site, and Chorro Reservoir, 13 miles northeast of the site. There are a few small reservoirs approximately 18 miles northeast of the site that are also used as potable water sources. Water is also imported into San Luis Obispo from the California Water Project. Smaller towns in the region depend on wells. There are two public water supply groundwater basins within 10 miles of the site. Avila Beach County Water and Sewer District and San Miguelito Natural Water and Sewer Company provide water to the Avila Beach and Avila Valley areas.

Diablo Creek flows through the DCPP site and past the ISFSI site, which are located near the mouth of Diablo Creek, where it discharges into the Pacific Ocean. PG&E owns all coastal properties north of Diablo Creek to the southerly border of Montana de Oro State Park and inland to a distance of 0.5 to 1.75 miles. Also, PG&E owns all the coastal properties south of Diablo Creek for approximately 8 miles and inland approximately 1.75 miles. There are two grazing leases for all the acreage north and south of the DCPP and ISFSI sites. An agreement in principle was reached in 2000 with the Central Coastal Regional Water Quality Control Board for 2,013 acres of watersheds draining to approximately 5.7 miles of coastline to be preserved forever by a conservation easement for ecological purposes. The primary goal of this conservation easement is to protect marine resources from Fields Cove to Coon Creek through watershed and habitat protection. Additionally, PG&E will protect 547 acres of land draining to Coon Creek through BMPs for as long as PG&E operates the plant or holds the property, whichever is longer.

Groundwater in the DCPP area is found in the narrow, relatively thin gravel alluvium along Diablo Creek, in fractures in the bedrock of the Obispo Formation, and along the contact that marks the top of bedrock and the base of some of the extensive terrace deposits along the coast. Ground water at the ISFSI is controlled by the water level of Diablo Creek. Clay beds beneath the ISFSI could impede groundwater infiltration and form temporary perched water tables during the rainy season. The elevation of Diablo Creek near the ISFSI is at approximately 100 feet MSL. The ISFSI pads will be located at an elevation of approximately 310 feet MSL.

Flood considerations for the DCPP site have been addressed in the DCPP FSAR. Flood design considerations for the ISFSI site have taken into account the topography and ISFSI site structures. In the event of a flood, Diablo Creek will remain intact and the flood waters will be contained by the canyon confining Diablo Creek. There are no dams or natural features in Diablo Creek that would hinder or retain runoff for a significant period of time. Any runoff water from the ISFSI can be drained by the adjacent natural and constructed drainage features.

Located in the vicinity of the ISFSI site are two water reservoirs, which are maintained as redundant water supplies supporting Unit 1 and Unit 2 operation. In the event of the water level in the reservoirs rising and overflowing, the local topography would cause the excess water to drain toward the creek and ocean, and away from the ISFSI.

4.6 Geology and Seismology

PG&E has conducted extensive analyses of the geologic and seismic characteristics of the region around the DCPP site and the proposed ISFSI site. The results of the DCPP Long Term Seismic Program, conducted in fulfillment of a License Condition for Unit 1, were submitted in a PG&E report and addendum dated July 1988 and February 1991, respectively. In June 1991, the NRC staff concluded that the License Condition had been satisfied.

PG&E conducted additional investigations of the ISFSI site in preparing the license application. The ISFSI and the CTF will be founded on sandstone and dolomite that is stable and able to support the loads imposed by the pads and casks. This bedrock composition is similar to that underlying the DCPP, and the ISFSI and DCPP are the same distance from the controlling seismic fault zone (the Hosgri fault). Therefore, the design basis ground motions analyzed for the DCPP are also applicable to the ISFSI. The additional studies performed for the ISFSI, coupled with the applicable analyses for the DCPP, led to PG&E's conclusion that there are no geologic hazards or adverse geologic or geotechnical conditions that would preclude construction and operation of an ISFSI at the designated site. PG&E's evaluation of the seismology of the ISFSI site is being considered by the NRC staff as part of its safety review of the ISFSI application. The results of the staff's review will be included in a separate safety evaluation report.

4.7 Ecology

The terrestrial and aquatic ecology in the area of the proposed ISFSI has been evaluated by PG&E numerous times from 1992 through 2001. The specific area evaluated by PG&E in the Environmental Report for this proposed action includes the ISFSI site itself and the 5-mile radius around it. The coastal marine environment was evaluated from the shore nearest the ISFSI site out to a distance of 100 feet.

The terrestrial ecological surveys identified more than 400 vascular plants and 12 vegetation communities in the area in and around the ISFSI site. The 12 communities are agriculture; Bishop pine; chaparral; coastal bluffs, rocks, and beaches; coastal scrub; developed areas; grassland; marsh; oak woodland; riparian; eucalyptus; and grassland with sparse coastal scrub. Each community and the plants unique to that community are described in Chapter 2 of the Diablo Canyon ISFSI Environmental Report. Surveys conducted by and for PG&E throughout the vicinity of the ISFSI site identified no sensitive plant species or botanical resources likely to be impacted by the project.

To determine the species present and their relative abundance, the California Wildlife Habitat Relationship Program (CWHR) was used. CWHR is a computerized database of the wildlife and habitats found in California. The wildlife habitats are the same as the communities identified for the plants of the area. Chapter 2 of the Diablo Canyon ISFSI Environmental Report provides a description of the wildlife that can be found in each community.

Terrestrial species currently listed or proposed for listing by the Federal government or the State of California as either endangered or threatened that could exist within the 5 mile radius of the ISFSI site include the brown pelican, peregrine falcon, Morro Bay shoulderband snail, California red-legged frog, and golden eagle (protected under the federal Bald Eagle Protection Act). However, based on the surveys conducted by and for PG&E, none of these species are found on or immediately adjacent to the ISFSI site.

The marine ecology in the area of Diablo Cove has been studied since 1976 under the Thermal Effects Monitoring Program (TEMP). This program includes periodic monitoring of intertidal and subtidal algae, invertebrates and fish and several physical parameters. Two marine species that frequent near-shore areas around the DCPP and are listed as threatened by the federal Endangered Species Act are the southern sea otter and green sea turtle. However, the proposed ISFSI activities will not result in discharges to the marine environment, and thus, there will be no impact on these species.

Diablo Creek and Coon Creek are the only streams in the area that contain fish. Both streams have a self-sustaining population of rainbow trout. One threatened fish species (the south/central California coast steelhead) and one endangered fish species (the tidewater goby) potentially occur in fresh water habitats in the surrounding region; however, surveys conducted at the DCPP site have not identified the presence of these fish species in either creek. PG&E will use BMPs during ISFSI construction to ensure that there will be no liquid discharges, and that storm runoff will be minimized to these fresh water environments.

4.8 Transportation

Public highways or railroads do not cross the owner-controlled area. Normal access to the DCPP site is from the south via a 6.5-mile long private road. The owner-controlled area is fenced and posted by PG&E. Avila Beach is immediately south of the owner-controlled area, outside of the security entrance gate. The private road through the owner-controlled area connects to a local public roadway, Avila Beach Drive, which runs along the shoreline of San Luis Obispo Bay. An unmanned U.S. Coast Guard station is located adjacent to the security gate, inside the owner-controlled area.

U.S. Highway 101 is the major access route for the DCPP and ISFSI site and for the other communities of San Luis Obispo County. The highway passes about 9 miles east of the site and can be accessed approximately 15 miles southeast of the site. U.S. Highway 1, which generally follows along the coast of California, also crosses San Luis Obispo County, but joins with Highway 101 in the vicinity of San Luis Obispo.

A paved coastal road (which becomes a dirt road) from Los Osos through Montana de Oro State Park can be used to access the owner-controlled area from the north in the event the private access road to the south is unusable. Access to the site from the Pacific Ocean can be gained by way of barge or private seagoing vessels near Avila Beach.

Commercial air traffic into and out of San Luis Obispo County is primarily through the San Luis Obispo Airport, approximately 12 miles east of the site. The airport is serviced primarily by turbo-prop airplanes that seat fewer than 42 people, and having a gross weight of no more than 30,000 pounds. There is a municipal airport located near Oceano, approximately 15 miles east-southeast of the DCPP site for small, private planes.

Coastal shipping lanes are approximately 20 miles offshore. The Port San Luis tanker-loading pier is located approximately 6 miles east-southeast of the DCPP site. The pier is located on property owned by the Port San Luis Harbor District and leased by UNOCAL, who built and owns the pier. However, since tanker traffic into Port San Luis has been discontinued, this pier is no longer used. In 1994, the tanker terminal at Estero Bay, approximately 10 miles north of the DCPP site, was closed; however, some petroleum products and crude oil continue to be stored there. Avila Pier, just south of the DCPP site, was closed in 1998 and the storage tanks were removed in 1999.

4.9 Regional Historic, Scenic, Cultural, and Natural Features

The ISFSI and DCPP sites are located in the historical territories of the Obispeno, the northernmost group of the Chumash Indians of Southern California. The term Obispeno refers to the group associated with Mission San Luis Obispo and does not reflect the native term the group used for themselves. The Obispeno subsisted upon the maritime resources, mollusks and fish species found along the shore.

When Mission San Luis Obispo de Tolosa was founded in 1772, Native Americans from around the area were recruited to build, farm, and work on the Mission. Poor living conditions and the introduction of European diseases decimated the Native American population. Little has been recorded or preserved of the Native American culture of the area. The Santa Ynez reservation, 40 miles northeast of Santa Barbara, is the only land given to the Northern Chumash by the Unites States government.

Many archeological investigations have been conducted over the years in and around the DCPP site. Since 1955, there have been a number of cultural resource investigations in the Diablo Creek area. One site in particular, CA-SLO-2, has yielded many important finds, including a cemetery complex containing the remains of 54 persons. Additional remains were uncovered during the late 1960s when grading for road construction was done in this area. All the remains uncovered were turned over to a local Native American group and were reburied. A large number of artifacts have also been discovered at CA-SLO-2. The inventory from the site includes stone, bone, wood, and shell artifacts, such as stone projectile points, blades,

knives, bowls, milling stones, pestles, charmstones, and shell beads. The earliest artifacts uncovered at CA-SLO-2 date back approximately 9,000 years. It is suggested that this site may have been a major village that figured prominently in the social, economic, and political life of the indigenous population.

In 1980, PG&E incorporated an Archeological Resources Management Plan (ARMP) into the DCPP operating license. The purpose of the ARMP is to protect and manage the CA-SLO-2 site. Photographs are taken at regular intervals from 23 stations on the DCPP site to monitor any physical changes to the site caused by natural and other processes. CA-SLO-2 is listed in the National Register of Historic Places, and is located approximately 150 meters from the ISFSI site, on the opposite (north) side of Diablo Creek. In addition to CA-SLO-2, seven smaller cultural resource sites are located within the 760-acre exclusion area surrounding DCPP, but none are located closer to the ISFSI site.

PG&E contacted the Santa Ynez Band of Chumash by letters in April and August of 2000 to solicit any comments on potential impacts of the proposed ISFSI. No formal responses were received, but two individuals expressed general concerns regarding potential effects of the ISFSI on the CA-SLO-2 site.

There are no natural landmarks in the area of the proposed ISFSI listed in the National Registry of Natural Landmarks. The proposed ISFSI site is located along a stretch of coast that is characterized by a relatively narrow and flat coastal plain that abuts the base of the Irish Hills.

4.10 Background Radiological Characteristics

The radiological characteristics of the DCPP site have been evaluated as part of the pre-operational and operational Radiological Environmental Monitoring Program (REMP). Nearly 30 years of environmental data have been collected in the area surrounding the two DCPP units. The results of the REMP are compiled into an Annual Radiological Environmental Operating Report and submitted to the NRC. In addition to the DCPP environmental samples routinely collected in accordance with the REMP, PG&E collected supplemental samples of vegetation and soil specifically in the area of the proposed ISFSI.

The typical average annual total effective dose equivalent to a person living anywhere in the United States from background sources of radiation is approximately 300 mrem. This dose comes from exposure to cosmic radiation, cosmogenic radionuclides, terrestrial radionuclides, inhaled radionuclides and radionuclides naturally occurring in the body. In comparison to the national average, radiological monitoring data collected for the year 1998 indicated that direct radiation levels from all sources were below 100 mrem at the DCPP site.

5.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

5.1 Non-radiological Impacts

5.1.1 Construction Impacts

The environmental impacts due to construction of the Diablo Canyon ISFSI are expected to be minimal, since the ISFSI will be located in a small area within the boundaries of the 760 acre owner-controlled area of the Diablo Canyon Power Plant, and the ISFSI site consists of soil previously disturbed during DCPP construction. Construction activities will be limited to the immediate area of the proposed ISFSI site (approximately 5 acres) and will primarily consist of excavation of the area where the concrete pads and the CTF will be located. A temporary batch plant will be located nearby between the 230kV and 500kV switchyards to provide concrete for the pads and CTF. Water from the existing raw water reservoir will be used for dust control and equipment cleaning. PG&E will use applicable BMPs for the control of dust and silt and to protect against erosion.

To develop the ISFSI site, the hillside area will be excavated and graded. Some existing paved areas and an existing road will be demolished and relocated. Approximately 120,000 cubic yards of material will be disposed of as a result of the excavation for the ISFSI pads, CTF, and the rerouted roadway. All excavated material will be deposited at one of three locations nearby; all three of these locations have been previously disturbed during plant-related construction. These locations are: the area adjacent to the temporary concrete batch plant (approximately 500 feet east of the ISFSI pad between the 230kV and 500kV switchyards); a portion of Parking Lot 7 (approximately 2000 feet south of the ISFSI); and Parking Lot 1 (approximately 2800 feet south of the ISFSI). These disposal areas are mostly paved or gravel-filled and have a low habitat value. These areas are readily accessible via existing on-site roads, and the transport and deposition of the excavated material is not expected to have any significant environmental impact.

Small areas of native and introduced vegetation will be removed during excavation of the ISFSI site. After the area is graded to the appropriate slopes to minimize erosion problems, the area will be re-seeded and mulched.

Construction of the ISFSI will not have an adverse impact on local water sources. PG&E will implement BMPs to limit the deposition of any loose soil and rock into Diablo Creek. These BMPs will also be employed for handling excavated material, which will be disposed of at the designated locations, where storm water runoff and erosion will be controlled.

The impact on air quality from construction activities will be limited to the gaseous emissions from diesel-powered construction equipment, and from fugitive dust emissions resulting from excavation activities and from equipment traveling on site roadways. Heavy construction equipment will be moved to the ISFSI site and will remain there until the construction work is completed, in order to minimize the movement of the equipment around the ISFSI site and on offsite roadways. Bulk quantities of gravel, asphalt, concrete, and reinforcing and structural steel will be transported from offsite locations to the ISFSI site. The impact of these activities on air quality will be minimal, and will only affect the immediate area.

The construction activities involved with building the ISFSI pads, CTF, fencing, and relocating roads are expected to require from 20 to 25 construction workers. The extra workers will be drawn from the local work force and therefore will have minimal impact on the local demography.

The effects of noise and traffic on the area as a result of construction activities are estimated to be small. Traffic to and from the construction site will be by way of existing paved roads and highways. The noise level from construction activities will be similar to the noise level from any similar construction project. The nearest resident is 1.5 miles from the ISFSI site and should not be affected by the construction noise. The construction workers will comply with the applicable OSHA noise regulations to minimize noise impacts.

ISFSI construction activities are not expected to impact any state or federally listed threatened or endangered plant, terrestrial wildlife, marine life or fish species. All such species that may occur within a 5 mile radius of the proposed facility were considered by the applicant. None of these species were found to inhabit the area on or immediately adjacent to the ISFSI site, nor were they identified at any of the disposal sites for excavated material.

The construction of the ISFSI will not impact the identified cultural resources on the DCPP site, specifically those in the area designated as CA-SLO-2, (or SLO-2). All activities affecting the SLO-2 site are governed by PG&E's Archeological Resources Management Plan, which is incorporated into the DCPP operating license. The Plan specifies that the licensee shall avoid disturbances to the SLO-2 site, and restricts vehicular traffic to the existing roads through the SLO-2 site. The SLO-2 site is fenced and notices are conspicuously posted. None of the activities necessary for ISFSI construction will result in the disturbance of the SLO-2 site, or the other cultural resource sites. Additionally, Diablo Creek forms a natural barrier between the ISFSI and SLO-2 sites to prevent any inadvertent encroachment of construction equipment or personnel onto the SLO-2 site.

5.1.2. Non-radiological Operational Impacts

Operation of the Diablo Canyon ISFSI will not require the use of any land in addition to that cleared for its construction, and no water is required. The terrestrial and aquatic environments and their associated plant and animal species are not expected to be adversely impacted by ISFSI operation. The fenced-in area of the ISFSI will occupy only 4-5 acres, so it will not significantly reduce the overall area available to terrestrial wildlife. As a result of previous development, this area has a low habitat value, so the presence of the ISFSI will have little additional impact. Operational activities will be limited to movement of the spent fuel in MPCs inside the HI-TRAC transfer cask to the CTF; transfer of the MPCs to storage overpacks, and placement of the overpacks on the storage pads. Due to the passive nature of the ISFSI, no gaseous or liquid effluents will be produced during operation. ISFSI operation will not create any significant noise, and will not cause any climate or socioeconomic impacts.

5.2 Radiological Impacts

5.2.1 Normal Operations

Radiation exposure from normal ISFSI operations is primarily due to direct and scattered radiation from the spent fuel in the casks placed on the concrete pads. PG&E maintains a

radiation protection program for the DCPP in accordance with 10 CFR Part 20 to ensure that radiation doses are maintained as low as reasonable achievable (ALARA), and this program will also apply to ISFSI activities. Radiological impacts to workers will result from routine activities, such as moving and handling the casks, performing radiation surveys, performing preventative and corrective maintenance and surveillance activities, and routine security patrols.

When the proposed ISFSI becomes operational, a portion of the spent fuel currently stored in the spent fuel pools will be moved to the ISFSI pads. Occupational doses may increase during spent fuel transfer, due to workers being in close proximity to the transfer cask while moving the loaded cask from the fuel handling buildings to the CTF and then to the ISFSI. All work will be done in accordance with the DCPP radiation protection program and occupational doses must be maintained below the limits set in 10 CFR Part 20.

During the initial phase of ISFSI construction, the radiation dose to the construction workers will be minimal. The construction workers will only be exposed to the natural background radiation of the site. When additional concrete storage pads are needed, construction work will be planned and executed in accordance with the DCPP ALARA program, to minimize the dose to workers from nearby loaded storage casks.

The storage of spent fuel in casks at the ISFSI is expected to result in very small radiation doses to the offsite population. The closest site boundary is 1400 feet from the ISFSI, and the nearest resident is 1.5 miles away. In its environmental report, PG&E provided the results of conservative calculations of offsite dose. These calculations assumed contributions to the total dose due to direct radiation from the spent fuel in the storage casks, as well as contributions from the spent fuel in the MPCs during their transfer to the storage overpacks and from hypothetical leakage of the MPCs. The MPCs are seal-welded and are considered leak tight, so that no leakage is expected during normal operation, off-normal conditions, or design basis accidents. The calculated annual dose to the nearest resident from ISFSI activities is 0.40 mrem, which is significantly below the annual limits specified in 10 CFR 72.104(a) and 10 CFR 20.1301(a), of 25 mrem and 100 mrem, respectively. The cumulative offsite dose to the nearest resident from all site activities is calculated to be 0.45 mrem/year, which is also significantly less than the limit referenced in 10 CFR 20.1301. Using the same conservative assumptions, PG&E calculated an annual dose at the nearest site boundary of 5.84 mrem, also well below the limit of 10 CFR 72.104(a).

The NRC staff reviewed the calculations and assumptions provided by PG&E. The staff also performed confirmatory calculations to verify the source term and checked the dose rates. Based on these results, normal ISFSI operations will not have a significant offsite radiological impact.

Radiological effects on wildlife are expected to be very small. No state or federally listed threatened or endangered species are present in the immediate area of the ISFSI site, and the area has a low habitat value due to its significant development and use. The ISFSI security fences will keep most species far enough from the storage casks that the resulting radiation doses should pose no threat to wildlife. However, some birds and small wildlife may intrude into the storage cask area. Based on reports of the International Atomic Energy Agency, radiation doses below approximately 100 rem/yr do not appear to have a significant effect on birds or small mammals. These doses could only be exceeded if an animal were to remain in almost constant contact with a storage cask. The storage casks and concrete pads would not provide

a conducive environment for wildlife, and the periodic required inspections of the casks by PG&E personnel would also discourage wildlife from remaining in the ISFSI area. Therefore, very few, if any, animals are expected to receive significant radiation exposure as a result of ISFSI operation, and the overall impact on wildlife will be very small.

5.2.2 Accidents

In its application for an ISFSI license, PG&E addresses four categories of design events as defined in ANSI/ANS-57.9, which include normal, off-normal, and accident events. Design Event I represents an event associated with normal operations, such as the normal ambient temperature range; the impacts from such events are similar to impacts due to normal operations at the ISFSI. Design Event II represents an event associated with off-normal operations that can be expected to occur with moderate frequency. Design Event III represents an infrequent event that could be reasonably expected to occur over the lifetime of the ISFSI. Design Event IV represents an extremely unlikely event that is postulated to occur because it establishes a conservative design basis for systems, structures, and components important to safety. Design Events II through IV are addressed in Chapter 8 of the Diablo Canyon ISFSI SAR.

Design Event II events are off-normal events which could potentially result in members of the general public being exposed to additional levels of radiation beyond those associated with normal operations. The types of events in this category include loss of external electrical power, off-normal ambient temperatures, off-normal pressures internal to the MPC, confinement boundary leakage, a cask drop from less than the allowable lift height, off-normal transporter operation, and partial blockage of storage cask air ducts. The off-normal confinement leakage and partial blockage of storage cask air ducts were the only events in this category determined to result in a slight increase in radiological consequences.

The off-normal confinement leakage due to a hypothetical leak in the MPC confinement boundary could result in a slight increase in the dose rate at the site boundary. However, PG&E's dose calculation for normal operation conservatively accounted for off-normal confinement leakage, therefore, the calculated dose contribution at the site boundary is the same as for that case, which is significantly below the regulatory limits of 10 CFR 72.104(a).

The partial blockage of storage cask air ducts could result in small additional doses to workers, due to actions necessary to remove the blockage. This event would not result in any measurable increase in dose at the site boundary. The dose received by the workers would also be controlled in accordance with the occupational dose rate limits specified in 10 CFR 20, Subpart C.

Design Events III and IV include more severe events such as earthquakes; tornados and missiles generated by natural phenomena; floods; fire and explosions; canister leakage under hypothetical accident conditions; storage cask drop or tip-over; loss of shielding; 100 percent blockage of air inlet ducts; electrical accidents; and transmission tower collapse. Of these events, the complete blockage of air inlet ducts, canister leakage, and loss of shielding are the events which could result in workers being exposed to increased levels of radiation. The calculated dose rate at the controlled area boundary fence line from each of these events is much less than the 5 rem limit specified for accidents in 10 CFR 72.106(b).

5.3 Impacts of Decommissioning

Decommissioning of the ISFSI will commence after the MPCs loaded with the spent fuel are transferred from the concrete overpacks and moved off site. After the fuel is moved off site, the ISFSI decommissioning activities will be conducted in accordance with the ISFSI decommissioning plan.

Decommissioning activities will include surveying the area to determine the levels, if any, of residual radioactive material. The concrete overpack materials may be slightly activated due to their long exposure to the small neutron flux emanating from the spent fuel. Any contaminated surfaces on the concrete pads, concrete overpacks, or CTF will be decontaminated by the most appropriate method for the surface. Contaminated materials suitable for burial in a near-surface burial site will be handled and disposed of in accordance with the regulations in 10 CFR Part 61. Small occupational exposures to workers could occur during decontamination activities, but these exposures would be much less than those associated with cask loading and transfer operations. Minor impacts from noise and dust could also result from dismantling the pad and structures, but they would be much less than similar construction impacts.

After the concrete pads, CTF, and concrete overpacks have been decontaminated and/or removed from the site, the final radiological survey will be conducted. If the results of the final survey indicate there is no residual radioactive material, then the site may be released for unrestricted use.

5.4 Cumulative Impacts

The NRC has evaluated whether cumulative environmental impacts could result from the incremental impact of the proposed action when added to the past, present, or reasonably foreseeable future actions in the area. The impact of the proposed Diablo Canyon ISFSI, when combined with previously evaluated effects from the Diablo Canyon Power Plant, is not anticipated to result in any significant cumulative impact at the site. The offsite radiation exposure limits for an ISFSI specified in 10 CFR 72.104(a) explicitly include any contribution to offsite dose from other uranium fuel cycle facilities in the region. Therefore, the offsite dose contribution from the DCPP has been included in the evaluation of radiological impacts from the proposed Diablo Canyon ISFSI.

6.0 MONITORING

In addition to the existing DCPP monitoring programs, monitoring specifically associated with the ISFSI will be performed, such as security checks and health physics monitoring. Thermoluminescent dosimeters will be placed along the ISFSI fence line to monitor the radiation dose from the loaded casks.

7.0 AGENCIES AND PERSONS CONSULTED

In accordance with NUREG-1748, “Environmental Review Guidance for Licensing Actions Associated with NMSS Programs,” the NRC staff consulted with several other agencies regarding the proposed action. These consultations are intended to afford the designated State Liaison agency the opportunity to comment on the proposed action, and to ensure that the

requirements of Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act are met with respect to the proposed action.

7.1 California Energy Commission

On April 25, 2003, the NRC staff discussed its preliminary findings with Ms. Barbara Byron of the California Energy Commission (CEC). On June 24, 2003, the NRC staff sent its draft Environmental Assessment for this action to the CEC for review and comment. The CEC provided its comments to the staff in a letter from Commissioner and State Liaison Officer James D. Boyd dated August 12, 2003. The following discussion summarizes the CEC's major comments and provides the NRC staff's responses. Additional editorial comments provided by the CEC were incorporated into this revised EA.

Comment : The CEC commented that the EA should describe the assurances that PG&E would provide that the Holtec International HI-STORM 100 cask system components will actually be built to design specifications and will perform as designed.

Response: Each applicant for an ISFSI license must describe its plans to conduct a quality assurance (QA) program that meets NRC regulations. By implementing an NRC-approved program, licensees ensure that activities involving items important to safety are performed in accordance with applicable requirements and standards. Each QA program includes requirements for the oversight of vendor and contractor activities. PG&E has described how it will conduct its QA activities in Chapter 11 of the Diablo Canyon ISFSI Safety Analysis Report, which it submitted as part of its ISFSI license application. The NRC staff will review this information and will document its findings in its safety evaluation report.

In addition, the NRC conducts inspections of licensees and of certain companies that provide nuclear services and equipment, including Holtec International, Inc. These inspections also help to ensure that key components are designed and fabricated consistent with technical standards and regulatory requirements.

Comment: The CEC commented that the total number of casks (140) to be stored at the ISFSI is important, and that the basis for that number should be explained.

Response: Section 2.1 of this EA has been revised to indicate the basis for the number of casks requested for the Diablo Canyon ISFSI.

Comment: The CEC commented that the EA should evaluate the indirect effect to the coastal marine environment by the proposed ISFSI. The CEC indicated that the ISFSI will allow plant operation beyond 2006, when the existing spent fuel storage capacity will be reached, and that the ISFSI also creates the potential to extend plant operation beyond the expiration dates of the current operating licenses.

Response: The environmental impacts of the ISFSI have been evaluated in this EA, and, as noted, the ISFSI itself will not impact the coastal marine environment. The environmental impacts of plant operation for Diablo Canyon Units 1 and 2 have been addressed for the full duration of the current operating licenses in the previous environmental reviews for initial licensing and for subsequent license amendments. Therefore, the ISFSI, if licensed, will not change the staff's previous evaluations of the environmental impacts from operation of Diablo

Canyon Units 1 and 2. If PG&E seeks extensions to the current operating licenses, it must submit a license amendment request, which will require a separate environmental review by NRC to address the impacts of that proposed action.

Comment: The CEC commented that the EA should describe the studies and surveys conducted that support the conclusion that the ISFSI will not have a significant impact on any threatened or endangered species. The CEC indicated that more detailed information on the extent, the dates, the number, and the personnel performing the studies and surveys should be provided.

Response: Section 4.7 of this EA summarizes the findings of the studies and surveys presented by PG&E in its Environmental Report. Section 2.3, "Ecology," of PG&E's Environmental Report describes in greater detail the studies and surveys conducted to assess potential impacts of the ISFSI on plants and wildlife in the area. In May of 2003, PG&E also elected to perform an additional field survey of the Morro shoulderband snail at the ISFSI site and the three disposal sites (see Section 7.3 of this EA). The results of that survey were reported to the NRC by letter dated June 24, 2003.

Comment: The CEC requested an explanation of the term "confinement boundary leakage" and why the "cask drop from less than allowable lift height" event is considered an event that could potentially result in members of the general public being exposed to additional levels of radiation beyond normal operations.

Response: The purpose of the referenced discussion in Section 5.2.2 of this EA is to describe the radiological impacts from potential off-normal events (assumed to occur with moderate frequency) associated with the ISFSI. NRC review procedures for ISFSI license applications identify three categories of events requiring evaluation: normal operations, off-normal events, and accidents (low-probability or hypothetical events). For normal operations and off-normal events, the analyzed radiation dose to a member of the public must be below 25 millirems to the whole body, as stated in 10 CFR 72.104(a). In Section 5.2.2 of this EA, the NRC staff concludes that the analysis provided by PG&E demonstrates that the offsite doses resulting from the off-normal events evaluated for the ISFSI are below the limit in 10 CFR 72.104(a).

After they are loaded with spent fuel, the HI-STORM 100 MPCs are welded shut and thus are sealed containers that are not expected to leak during the ISFSI storage period. Nevertheless, for analysis purposes, it is assumed that the canister does not remain leaktight and that there is some small release of radioactive gases from the MPC ("confinement boundary leakage"). This hypothetical event is analyzed because it typically bounds the other off-normal events with respect to calculated offsite doses.

For the HI-STORM 100 system, the "cask drop from less than allowable lift height" event is not expected to damage the MPC enough to cause the confinement boundary to leak. It is only mentioned as a type of off-normal event that should routinely be considered and evaluated in the review of spent fuel storage cask designs.

Comment: The CEC commented that there is no discussion in the EA of the potential destruction of the casks or blockage of air inlet ducts as the result of sabotage or a terrorist attack. The CEC indicated that there should be a description of how decisions are being made

regarding the configuration, design and spacing of the casks, the use of berms, and the location of the ISFSI to minimize the vulnerability of the ISFSI to a potential attack.

Response: In several recent cases, including an appeal of a decision in the Diablo Canyon ISFSI hearing, the Commission has determined that an NRC environmental review is not the appropriate forum for the consideration of terrorist acts. The NRC staff considers the security of spent fuel as part of its safety review of each application for an ISFSI license. In addition to reviewing an ISFSI application against the requirements of 10 CFR Part 72, the NRC staff evaluates the proposed security plans and facility design features to determine whether the requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials," are met. The details of specific security measures for each facility are Safeguards Information, and as such, can not be released to the public.

The NRC has also initiated several actions to further ensure the safety of spent fuel in storage. Additional security measures have been put in place at nuclear facilities, including ISFSIs currently storing spent fuel. These measures include increased security patrols, augmented security forces and weapons, additional security posts, heightened coordination with law enforcement and military authorities, and additional limitations on vehicular access. Also, as part of its comprehensive review of its security program, the NRC is conducting several technical studies to assess potential vulnerabilities of spent fuel storage facilities to a spectrum of terrorist acts. The results of these studies will be used to determine if revisions to the current NRC security requirements are warranted.

Comment: The CEC commented that the EA should address the foreseeable potential impacts from the increased number of spent fuel shipments that may result from the ISFSI. The CEC maintained that the ISFSI creates the potential to extend the life of the operating facility beyond the current expiration of the operating licenses. The CEC stated that the EA should evaluate the potential spent fuel transportation impacts.

Response: If the NRC issues a license for the ISFSI, that license will not authorize PG&E to operate Diablo Canyon Units 1 and 2 beyond the current expiration dates of their respective operating licenses. The amount of spent fuel to be generated over the duration of the current operating licenses will not change as a result of this action. The environmental impacts of offsite transportation of all of the spent fuel generated for the duration of the current operating licenses have been specifically addressed in the previous environmental reviews for initial licensing and for subsequent license amendments for DCPP, and in other NRC environmental reviews related to spent fuel transportation.

7.2 California Office of Historic Preservation

On April 24, 2003, the NRC staff discussed the preliminary findings of this EA with Mr. Hans Kreutzberg of the California Office of Historic Preservation. The staff identified the existence of the SLO-2 site and described the controls and physical features that PG&E will employ to ensure that the site will not be disturbed as a result of the proposed ISFSI. By letter dated July 2, 2003, to Dr. Knox Mellon, California State Historic Preservation Officer, the NRC staff requested concurrence in its finding that historic properties would not be adversely affected by the proposed ISFSI. The State Historic Preservation Officer concurred in the NRC staff's finding on July 30, 2003.

7.3 U.S. Fish and Wildlife Service

On April 24, 2003, the NRC staff discussed its preliminary findings with Mr. Chris Kofron of the U.S. Fish and Wildlife Service (FWS), Ventura Field Office. Mr. Kofron suggested that it would be useful to perform a specific survey for the Morro shoulderband snail, an endangered species noted to occur in the region. Although PG&E had not previously identified the presence of that snail species in the vicinity of the proposed ISFSI site, the applicant elected to conduct an additional species-specific survey of the ISFSI site and the three excavated material disposal sites from May 15-19, 2003. The results of the survey, reported to the NRC staff in a letter dated June 24, 2003, concluded that the Morro shoulderband snail is not found in the vicinity of the proposed ISFSI, nor in the areas of the three disposal sites.

In a follow up discussion on June 17, 2003, Mr. Kofron noted that the tidewater goby, a species of endangered fish, has been identified in areas of Coon Creek, a portion of which runs on the DCPP site. PG&E's environmental report acknowledged that the tidewater goby could possibly occur in Coon Creek, although it is considered a marginal habitat. However, the species has not been found in surveys of Diablo Creek, which forms a natural barrier between the ISFSI site and Coon Creek; therefore, PG&E concluded there would be no impact on that species from the ISFSI. Mr. Kofron also asked the staff about the potential impacts of runoff on Diablo Creek during ISFSI construction. The primary drainage path for runoff from the ISFSI site will be along the existing access road, away from Diablo Creek. However, some runoff from the ISFSI area could drain into the creek following heavy rains. PG&E will use BMPs to control drainage and minimize runoff into the creek, and the impact of any runoff associated with ISFSI construction is expected to be very small.

By letter dated August 14, 2003, the NRC staff requested that the FWS provide an official species list for the project area. On September 10, 2003, the FWS transmitted that official species list. The NRC staff confirmed that PG&E's Environmental Report considered those threatened and endangered species identified by the FWS, and that the proposed project would not impact those species.

8.0 CONCLUSION

The NRC staff concludes that the construction, operation, and decommissioning of the Diablo Canyon ISFSI will not result in a significant impact to the environment. Construction impacts of the ISFSI will be minor, and limited to the small area of the ISFSI site and the excavated material disposal sites. The site chosen for the ISFSI on PG&E's owner-controlled area has been previously excavated. Similarly, the disposal sites for the excavated material are also previously disturbed areas, which will not be significantly impacted. There will be minor impacts of increased noise and dust from construction equipment and activities during the construction phase, but this phase will be of short duration and will not impact off-site populations. The extra workers needed during the construction phase can be obtained from the local population without an adverse impact on the demographics of the area. The proposed ISFSI area and the disposal areas have been extensively surveyed and are not known to contain any threatened or endangered species. The proposed ISFSI site is near a site which is included in the National Register of Historic Places, CA-SLO-2, but construction of the ISFSI will not cause any adverse impacts to that site, due to the natural features and to the administrative controls employed by PG&E.

There will be no significant radiological or non-radiological environmental impacts from routine operation of the ISFSI. The ISFSI is a passive facility and no liquid or gaseous effluents will be released from the storage casks. The dose rates from the spent fuel will be limited by the design of the storage cask concrete overpacks. The total occupational dose to workers at the DCPP site may increase slightly due to work associated with loading, transferring, and storing the casks, but all occupational doses must be maintained below the limits specified in 10 CFR Part 20 and must be kept ALARA, in accordance with PG&E's radiation protection program. The annual dose to the nearest resident from ISFSI activities is estimated to be 0.40 mrem/year, which is significantly below the limits specified in 10 CFR 72.104 and 10 CFR 20.1301(a). The cumulative dose to an individual offsite from all site activities will be 0.45 mrem/year, which is less than the limit specified in 10 CFR 20.1301. Occupational doses received by facility workers will not exceed the limits specified in 10 CFR 20.1201.

The impacts from decommissioning the ISFSI will be much less than the minor impacts of construction and operation. Very small occupational exposures could occur during decontamination activities, if they are necessary, and minor noise and dust impacts could result from dismantling the pad and structures.

The environmental impacts of the proposed action have been reviewed in accordance with the requirements of 10 CFR Part 51. The NRC staff has determined that the storage of spent nuclear fuel at the Diablo Canyon ISFSI will not significantly affect the quality of the human environment. Therefore, an environmental impact statement is not warranted for the proposed action, and pursuant to 10 CFR 51.31, a Finding of No Significant Impact is appropriate.

The documents related to this proposed action are available for public inspection and copying at NRC's Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. Additionally, most of these documents are available for public review through the NRC's electronic reading room, at: http://www.nrc.gov/reading-rm.html.

9.0 LIST OF PREPARERS

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