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APPEAL STAFF REPORT
DE NOVO REVIEW

APPEAL NO.:	A-3-SLO-04-035
APPLICANT:	Pacific Gas and Electric Company
LOCAL GOVERNMENT:	County of San Luis Obispo
SUBSTANTIAL ISSUE:	On July 15, 2004, the Commission found that the appeals of the local government action on this project raised substantial issue.
PROJECT DESCRIPTION:	Construct and operate a radioactive waste storage facility known as an Independent Spent Fuel Storage Installation (ISFSI) within the high security area of the Diablo Canyon power plant complex.
PROJECT LOCATION:	Diablo Canyon Nuclear Power Plant, P.O. Box 56, Avila Beach 93424 (approximately 6 miles north of Avila Beach), County of San Luis Obispo.
APPELLANTS:	Pacific Gas and Electric Company Mothers For Peace Sierra Club, Santa Lucia Chapter Commissioners Pedro Nava and Sara Wan

EXECUTIVE SUMMARY

PROJECT DESCRIPTION

The proposed development is the construction and operation of a storage facility for used nuclear fuel from the Diablo Canyon Power Plant. The "spent fuel" from the power plant's nuclear reactors is highly radioactive and requires secure storage for thousands of years to prevent harm to humans and the environment. The project would be located within the high security area of the power plant complex several miles north of Avila Beach, San Luis Obispo County (see Exhibit 1). The high security area includes about a mile-and-a-half of shoreline within the twelve miles of coastal property covered by PG&E's Diablo Canyon lands. The storage facility, known as an ISFSI (Independent Spent Fuel Storage Installation), includes several main elements – a facility to move spent fuel from existing storage pools near the power plant into protective casks, a transfer facility to place those protective casks within permanent "overpack" casks, and a new storage area consisting of up to seven large concrete pads that will hold up to 140 of these casks. The transfer facility and storage area would be located several hundred yards inland and uphill from the power plant (see Exhibit 3). The project would also require portions of an existing road between the power plant and storage area be upgraded and realigned, and the construction and operation of a concrete batch plant. The project will result in removal of up to about 150,000 cubic yards of soil, primarily to create the storage area, and includes three soil disposal areas, also to be located within the high security area.

Federal law pre-empts the state from imposing requirements related to nuclear safety or radiation hazards. This report, therefore, evaluates only those issues necessary to determine conformity to the policies of the San Luis Obispo County LCP and with the public access and recreation policies of the Coastal Act and does not address the issues pre-empted by federal law.

PRIOR COMMISSION ACTION

The project is located within the coastal zone and requires a coastal development permit from the County of San Luis Obispo. On April 20, 2004, the County approved a coastal development permit for the proposed project. Several parties appealed, and on July 15, 2004, the Commission found that the appeals raised substantial issue with respect to the grounds on which they were filed, and opened and continued a public hearing for the de novo portion of the appeal.

KEY ISSUES

Significant project-related impacts include:

Public Access: This report evaluates the proposed project's effects on public access to the shoreline. The recommended findings include a nexus determination and a "rough proportionality" analysis to determine the extent of lost access caused by the proposed project. The findings evaluate several issues related to the need for and purpose of the proposed ISFSI, including the lack of an alternative permanent storage facility for spent fuel and unresolved

issues about the remaining useful life of the Diablo Canyon power plant, which is the existing cause of lost shoreline access along this stretch of the coast. Because other alternatives for storing the fuel are unavailable, are infeasible, or would cause greater adverse risk to public health and the environment, and because it is likely that the power plant will have a shorter operating life than the proposed ISFSI, a key conclusion of staff's evaluation is that the ISFSI will be present on this site for the foreseeable future and will therefore cause loss of access to part of the California shoreline in perpetuity.

Staff determined that the current value of access that will be lost due to the ISFSI is approximately 275 visits per day, or about 100,000 per year. This level was reached based on applying a number of conservative assumptions to the visitation levels at nearby coastal properties. Those assumptions also recognized the unique characteristics of, and requirements related to, the Diablo Canyon lands shoreline, including security, public health and safety, sensitive habitat, and archaeological resources.

Based on its analysis, staff recommends the Commission adopt findings and impose **Special Condition 3** that would require PG&E to address this loss of access by providing several accessways on the Diablo Canyon lands to the north and south of the high security area, implementing various management measures that would allow, at minimum, pedestrian access during daylight hours to these accessways, identifying the improvements necessary to provide at least the equivalent of the lost level of access, and protecting those accessways in perpetuity through deed restrictions.

Geologic Hazards: This report evaluates the seismic characteristics of the project site and surrounding area, the slope stability of the project site, and coastal erosion concerns at the Diablo Canyon complex. As noted above, federal law pre-empts local or state governments from imposing conditions related to radiological hazards. The Commission staff's recommended findings regarding these geologic issues therefore address only those concerns related to structural stability, stability of nearby landforms, and the potential for coastal erosion to affect the proposed project, as required by the LCP.

The Commission staff geologist generally concurs with PG&E's descriptions and analyses of the project site's geologic characteristics, which have also been recognized as adequate for the proposed project by the federal Nuclear Regulatory Commission. Staff is recommending **Special Condition 4** to require ongoing monitoring and maintenance of protective devices to ensure that slope movements do not threaten the project and **Special Condition 5** to require ongoing monitoring to ensure the development is not threatened by coastal erosion.

STAFF RECOMMENDATION

Staff recommends the Commission approve, as conditioned, proposed project A-3-SLO-04-035 as described in the staff report dated November 23, 2004.

TABLE OF CONTENTS

1.0 RECOMMENDED MOTION AND RESOLUTION 6

2.0 STANDARD CONDITIONS 6

3.0 SPECIAL CONDITIONS 8

4.0 RECOMMENDED FINDINGS AND DECLARATIONS 13

4.1 PROJECT PURPOSE AND DESCRIPTION 13
4.2 COASTAL COMMISSION JURISDICTION 17
4.3 OTHER PROJECT-RELATED ISSUES 18
4.4 CONFORMITY TO APPLICABLE POLICIES OF THE COASTAL ACT AND THE CERTIFIED LOCAL COASTAL PROGRAM 24
4.4.1 Public Access and Recreation 24
4.4.2 Geologic Hazards 40
4.4.3 Environmentally Sensitive Habitat Areas 59
4.4.4 Water Quality and Spill Prevention & Response 68
4.4.5 Cultural and Archaeological Resources 73
4.4.6 Water and Sewage Service 75
4.4.7 Visual Resources 77
4.4.8 Energy Production 78

5.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT 79

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS 80

EXHIBITS 82

EXHIBITS

EXHIBIT 1: Location Map
EXHIBIT 2: Diablo Canyon lands
EXHIBIT 3: Site Map
EXHIBIT 4: Pecho Coast Trail Map
EXHIBIT 5: Regional Tectonic Map
EXHIBIT 6: Local Tectonic Map
EXHIBIT 7: Site Geologic Map
EXHIBIT 8: Geologic evolution
EXHIBIT 9: Crouch model; from paper
EXHIBIT 10: McLaren and Savage Model; from paper
EXHIBIT 11: Namson Cross Section
EXHIBIT 12: Plan View Hosgri seismicity
EXHIBIT 13: X-Section view Hosgri Seismicity
EXHIBIT 14: USGS & PG&E Seismograph locations
EXHIBIT 15: LTSP & Hosgri spectra, horizontal
EXHIBIT 16: LTSP & Hosgri spectra, vertical
EXHIBIT 17: ILP Spectra, horizontal
EXHIBIT 18: ILP Spectra, horizontal
EXHIBIT 19: Cross section showing adverse bedding, clay beds SAR Figure 2.6-18
EXHIBIT 20: Slide Mass Model 1 2.6-47
EXHIBIT 21: Slide Mass Model 2 2.6-48
EXHIBIT 22: Slide Mass Model 3 2.6-49
EXHIBIT 23: Geologic Map of site; Shoreline Retreat Study Figure 2
EXHIBIT 24: Retreat Rate tables; Shoreline Retreat Study Tables 2 and 3
EXHIBIT 25: Geologic Map of landslide; includes setback line; Setback Study Figure 2
EXHIBIT 26: Cross section of landslide; Setback Study Figure 3
EXHIBIT 27: Inclinometer study; Setback Study Figure 6

1.0 RECOMMENDED MOTION AND RESOLUTION

Staff recommends the Commission, after a public hearing, approve a coastal development permit for the proposed development subject to the standard and special conditions below.

Motion:

> *I move that the Commission approve Coastal Development Permit No. A-5-LOB-03-239 pursuant to the staff recommendation.*

Staff recommendation of Approval: Staff recommends a **YES** vote. Passage of this motion will result in approval of the coastal development permit as conditioned and adoption of the following resolution and findings. The motion passes only by an affirmative vote by a majority of the appointed Commissioners present.

Resolution to Approve a Coastal Development Permit:

> *The Commission hereby approves the coastal development permit on the grounds that the development as conditioned will be in conformity with the policies of the San Luis Obispo County Local Coastal Program and will be in conformity with the public access and recreation policies of Chapter 3 of the Coastal Act. Approval of the coastal development permit complies with the California Environmental Quality Act because either: (1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment; or, (2) there are no feasible mitigation measures or alternatives that would substantially lessen any significant adverse effects of the development on the environment.*

2.0 STANDARD CONDITIONS

1. **Notice of Receipt and Acknowledgment**: This permit is not valid until a copy of the permit is signed by the Permittee or authorized agent, acknowledging receipt of the permit and the acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration**: Construction activities for the proposed project must be initiated within two years of issuance of this permit. This permit will expire two years from the date on which the Commission approved the proposed project if development has not begun. Construction of the development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made at least six months prior to the expiration date.

3. **Interpretation**: Any questions of intent or interpretation of any condition will be resolved by the Executive Director of the Commission (hereinafter, "Executive Director") or the Commission.

4. **Assignment**: The permit may be assigned to any qualified person, provided the assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land**: These terms and conditions shall be perpetual, and it is the intention of the Commission and the Permittee to bind all future owners and possessors of the subject property to the terms and conditions.

3.0 SPECIAL CONDITIONS

1. **Submittal of Other Permits:** Prior to starting project construction, the Permittee shall provide to the Executive Director a copy of other approved local and state permits, as applicable, from the following:

   - County of San Luis Obispo construction permit
   - California Department of Forestry/County Fire Department
   - California Regional Water Quality Control Board
   - California Department of Fish and Game
   - San Luis Obispo County Air Pollution Control District
   - Environmental Health Department

2. **Decommissioning or Changes to the ISFSI:** This permit does not authorize development activities associated with potential decommissioning of the ISFSI or changes to the ISFSI not described in permit submittals. The Permittee shall submit a new coastal development permit application or amendment to this permit if such activities are proposed.

3. **Managed Access to Diablo Canyon Lands:** Within six months of permit approval, the Permittee shall submit to the Executive Director for review and approval a plan (hereinafter, the "Access Plan") to provide public access to the shoreline of the Diablo Canyon lands. The Diablo Canyon lands are those lands owned or controlled by the Permittee within the coastal zone between Montana de Oro State Park and the Port San Luis Harbor District. That Access Plan shall include, at minimum, the provisions specified below.

   a) Goals of Access Plan: The level of access provided shall be at least roughly commensurate to the current value of access lost due to the ISFSI (i.e., providing access opportunities allowing approximately 275 visitors per day). Access shall be reasonably managed to address security and safety needs and to avoid or minimize impacts to sensitive habitats, agricultural operations, and other coastal resources. The Access Plan shall identify the annual level of visitation anticipated for each of its accessways and the basis for determining that level of visitation.

      The Access Plan shall support and be consistent with applicable policies and provisions of adopted local and state coastal access plans and programs, including those of the adjacent and nearby coastal areas at Montana de Oro State Park, Port San Luis Harbor District, and San Luis Bay. The plan shall include measures to implement applicable goals and principles of the California Coastal Trail, pursuant to the report and maps contained in Completing the California Coastal Trail (January 2003). The Access Plan shall specify how aspects of its access provisions are intended to support the goals, policies, and provisions of these other access plans and programs. The plan shall describe coordination efforts with adjacent property owners to determine the potential effects of access on those properties and to identify ways to avoid or minimize conflicts.

b) Type and Extent of Access: The Access Plan shall provide, at a minimum, access to the shoreline at the following locations:
   - Lateral access to approximately three miles of coastal blufftop on the northern portion of the Diablo Canyon lands between Montana de Oro State Park and Crowbar Creek. Access shall be provided along the existing unimproved blufftop roads and trails in this area, and shall include at least three overlooks to beach areas from the blufftop accessways.
   - Vertical access to at least one beach in the northern portion of the Diablo Canyon lands (e.g., Point Buchon beach, near the northern boundary) and lateral access along that beach.
   - Increased access to the Pecho Coast Trail on the southern portion of the Diablo Canyon lands, as allowed within the provisions of the *Pecho Coast Trail Accessway Management Plan* and the Memorandum of Understanding governing that Plan. As part of the Access Plan, the Permittee may request an amendment to the existing Pecho Coast Plan or MOU to allow additional access, if necessary.

   The Permittee shall consider other measures to support the goals and requirements identified above. These other measures may include:
   - Additional vertical and lateral access to other beaches if such access will not cause significant adverse effects to other coastal resources, or if access can be provided to those beaches subject to closure during critical or sensitive times (e.g., closure during seal pupping season).
   - Improvements to adjoining or nearby properties that will support access to the shoreline of the Diablo Canyon lands, such as improving connecting trails on adjacent State Park lands, improvements to the Point San Luis lighthouse, funding support personnel to manage visitation, providing additional parking, bike lockers, kayaks, etc. Any such measures proposed for lands not owned or controlled by the Permittee shall be accompanied by property owner approval. Some proposed measures may require additional coastal development permit review and approval.

c) Management Considerations: The Access Plan shall specify provisions necessary to manage access in recognition of security, public safety, and protection of other coastal resources. The Access Plan shall, at a minimum:
   - Provide pedestrian access during daylight hours to the accessways identified in the plan.
   - Identify the minimum provisions necessary to meet federal security and public health and safety requirements and their effect on meeting the goals of this condition.
   - Identify the status of access to all public tidelands (i.e., below the mean high tide line) on the Diablo Canyon lands, and the measures available to ensure access to those tidelands as well as measures in place that prohibit or limit access to those areas.
   - Provide deed restrictions that will ensure legal protection to the accessways in perpetuity. In areas where coastal erosion could reduce or eliminate the accessways, the legal mechanism for protection shall be established so that the accessway moves with the shoreline. Deed restrictions proposed in the Access Plan shall be submitted to the Executive Director within 30 days of plan approval by the Executive Director.

The accessways shall conform to the requirements of LCP Section 23.04.420 regarding minimum widths, necessary improvements, and signage, and other supporting infrastructure.

- Identify specific improvements needed along the various accessways to provide the proposed level of access, including detailed descriptions of improvements such as parking, road and trail improvements, boardwalks, benches, signs, overlooks, garbage and sewage service, or other similar improvements necessary to support the proposed level of visitation. Improvements described in the approved Access Plan shall be maintained for the life of the project.
- Identify specific measures that will be taken to ensure the accessways and improvements avoid or minimize conflicts with agriculture, sensitive resource areas, archaeological sites, and other significant coastal resources.
- Identify provisions for the management of the accessways that may include management by a non-profit organization approved by the Executive Director or an appropriate public recreational agency.

d) Timing of the Access Plan: All accessways and improvements in the Access Plan shall be constructed and made available for public access within two years of Executive Director approval. The Access Plan shall include a schedule showing the anticipated dates of construction and implementation of the various plan components during this time period. Deadlines for submittals or for implementation of plan elements may be extended by the Executive Director for good cause.

e) Monitoring and Reporting:
   - Monitoring: The Access Plan shall include monitoring and evaluation measures to determine the success in implementing the plan. The measures included shall be those reasonably necessary to determine the following:
     - a comparison of the proposed construction and implementation schedule with actual completion of elements of the plan;
     - a comparison of the levels of visitation anticipated in the plan with actual levels of visitation at the various accessways;
     - a description of the effects, if any, of visitation on security and public safety and on coastal resources, including sensitive habitats or species, archaeological resources, and coastal agriculture, and the measures taken to avoid or reduce those effects.
   - Reporting: For each of the five years after Commission approval, the Permittee shall submit annual reports to the Executive Director describing implementation of the plan and the results of the above monitoring measures. After the first five years, the Permittee shall submit reports every five years that compile the previous five years worth of monitoring data and information.

4. **Monitoring Cut Slopes**: The Permittee shall monitor the cut slopes above the ISFSI storage area and the transport road for sliding, ground movement, or other motion using the measures and monitoring devices described in the project's *Safety Analysis Report*. Any protective devices such as rock bolts or tiebacks shall be monitored for signs of corrosion, distress, or failure and shall be replaced as necessary to maintain their effectiveness. No later than June 30 of each year, the Permittee shall submit annual reports, prepared by a licensed Civil Engineering Geologist and Civil Engineer, to the Executive Director describing the results of the monitoring. The Permittee shall notify County staff and the Executive Director immediately in the event of slope failure or movement that may indicate imminent slope failure. If monitoring results for any annual report indicate slope movement may require additional measures to protect the development, the Permittee shall submit a coastal development permit application or request for an amendment to this permit.

5. **Monitoring Shoreline Erosion**: The Permittee shall conduct annual surveys of the shoreline nearest the ISFSI transport road and Soil Disposal Site #2 (i.e., from the corner of Shore Cliff Road and Plant View Road on the west to the headland east of the soil disposal site). The surveys shall start during the first year of project construction and continue through the life of the project. Surveys shall be conducted by a licensed Surveyor or Civil Engineer. Each annual survey shall be performed in the early spring when the beach level is lowest and the lower bluff face is most exposed, or as close to that time as is feasible. Each survey shall record the position of the upper bluff edge and lower toe of the bluff using conventional survey techniques (total station, rod and level, plane table, etc.), differential Global Positioning System (GPS), photogrametry (with current ortho-rectified aerial photographs), by ground Light Detection and Ranging (LIDAR), or other comparable technique. Survey techniques used shall be consistent throughout the survey period or shall allow consistent comparison of yearly data. Survey measurements shall be accurate within 0.5' horizontal and 1.0' vertical.

   The Permittee shall report the results of each survey to the Executive Director by June 30 of each year. Each report shall include narrative and mapped analysis of the survey data, a determination of the average retreat rate for the full survey area, identification of any locations where the bluff change rate is more than two standard deviations from the average. Bluff change shall be calculated at 50' intervals (or smaller) to determine the average retreat, standard deviation and to identify areas of outlier retreat rates. The report shall also include monitoring data from the existing inclinometers installed to measure movement of the Patton Cove landslide area.

   If monitoring results for any annual survey indicate the development may be threatened by coastal erosion in less than 75 years from the start of construction, the Permittee shall submit within sixty days of the annual survey report a coastal development permit application or request for an amendment to this permit to relocate the transport road and other project components as needed.

6. **Restoration Plan**: PRIOR TO PERMIT ISSUANCE, the Permittee shall submit for Executive Director review and approval a revision of the *Native Vegetation Restoration and Monitoring Plan* submitted in August 2004 that includes two additional provisions: (1), that reports identified in the plan (e.g., "as-built" report, annual monitoring reports, etc.) to be submitted to the County are also submitted to the Executive Director for review and approval; and (2), that seeds or propagules used to revegetate restore areas are collected or obtained from sources within 35 miles of the Diablo Canyon lands, and any vendor or collector shall certify the origin of these seeds or propagules.

7. **Protection of Archaeological Resources:** Prior to starting construction, the Permittee shall submit for Executive Director review and approval a plan describing the measures to be included as part of project activities to protect archaeological resources. The plan (known in the County's requirements as a *Construction Treatment Plan*) shall be developed by a County-qualified archaeologist and shall describe, at minimum:

   - Procedures for notifying the Executive Director and other involved or interested parties in the event of a discovery, including the procedures to stop project-related activities until an archaeologist can determine the status and significance of the discovery and the procedures for re-starting project activities;
   - Procedures that would be used to record, evaluate, and mitigate discoveries; and,
   - Procedures that would be followed in the event of discovery of disturbed as well as intact human burials and burial-associated artifacts.

4.0 RECOMMENDED FINDINGS AND DECLARATIONS

The Commission finds and declares as follows:

4.1 PROJECT PURPOSE AND DESCRIPTION

Project Purpose: The primary purpose of the project is to store used nuclear fuel near the Diablo Canyon power plant until the fuel can be moved to an off-site permanent repository to be established by the federal government. The project will allow the power plant to continue operating past 2006 when its existing on-site storage is expected to reach capacity. The proposed project is designed to provide storage capacity for spent fuel generated at the power plant during the remaining 21 years of its operating license.

Project Location: The project would be located within approximately 12,000 acres of lands owned or controlled by PG&E along coastal San Luis Obispo County (see Exhibit 1). These lands extend along about twelve miles of coastline between Port San Luis on the south to Montana de Oro State Park on the north. About 4,000 acres of these lands are within the coastal zone, including the project location at the Diablo Canyon power plant complex (see Exhibit 3). [Note: For purposes of this report, the approximately 4,000 acres within the coastal zone are referred to as the "Diablo Canyon lands".] PG&E manages these lands as open space, as a security buffer, for agricultural and grazing operations, and for habitat values. The County's certified LCP designates most of these lands as "Sensitive Resource Areas", including significant areas of native habitat used by a wide variety of plant and animal species, including some considered endangered, threatened, or sensitive. The area also includes several significant archaeological sites.

Near the center of the shoreline in these lands is the Diablo Canyon power plant complex, consisting of approximately 760 acres of high security area around the nuclear facilities, the power plant, and associated infrastructure (see Exhibit 3). The various elements of the proposed project are located within this high security zone on areas that were developed or disturbed during construction of the power plant facilities in the 1980s.

Project Description: The material to be stored in the ISFSI is spent nuclear fuel from the two generating units at Diablo Canyon. The fuel used by the reactors is contained within metal rods about twelve feet long. These rods are grouped into fuel assemblies of 264 fuel rods. Each of the two reactors holds 193 fuel assemblies, and each fuel assembly is used in the generating units for about three to five years.

Although described as "spent" fuel, the material is considered high-level radioactive waste and must be stored securely for tens of thousands of years. During the three to five years the fuel is used in a nuclear reactor, its level of radioactivity increases significantly due to radioisotopes formed during the nuclear fission process. After the fuel is removed from the reactor, it is stored in one of two "wet storage" pools located between the two reactors at the power plant.

The water in these pools provides the shielding necessary to prevent human and environmental exposure to the high level of radioactivity when the fuel is first removed from the reactors and into the pools. Due to this initial high level of radioactivity, the fuel must remain in these pools for at least five years, and then can be transferred to another facility, if one if available. Because no other storage facilities have been available, all the spent fuel used since the start of the Diablo Canyon power plant operations is currently stored in these two pools. The pools were initially designed for low-density storage, and could hold about 300 fuel assemblies. The pool capacity was increased in the late 1980s by "re-racking" the storage units so that they now have a capacity of about 1,324 fuel assemblies. PG&E estimates that the pools as currently configured have adequate storage for spent fuel until 2006, at which time additional storage will be needed if the power plant is to continue to operate. The project is currently proposed to handle only spent material generated at Diablo Canyon.

Main Project Elements: The project involves constructing and operating an "Independent Spent Fuel Storage Installation" (ISFSI). The project would allow PG&E to remove spent fuel from storage pools near the power plant, transfer the fuel into protective casks, and relocate the fuel to a dry storage area several hundred yards inland of the power plant.

The main elements of the project will cover about 9 acres within the 760-acre high security zone of the Diablo Canyon complex[1]. Key construction and operational elements of the ISFSI include the following:

- Initial fuel transfer area: The initial fuel transfer for the ISFSI will take place within and adjacent to the existing storage pools, located between the two reactors. The spent fuel stored in the pools will be transferred first into Multi-Purpose Canisters (MPCs) and then into Transfer Casks. The MPCs are designed to confine radioactive materials and dissipate the heat generated from the decaying fuel. The Transfer Casks are heavy-walled steel cylinders that provide further shielding for the spent fuel.

- Fuel transport: The Transfer Casks will be loaded onto a Cask Transporter, a heavy, wheeled vehicle that will be used to move the Transfer Casks about one mile along the service road to the Cask Transfer Facility. The road to be used is within the existing high security area of the Diablo Canyon complex. Portions of the road will be upgraded or realigned to allow better movement by the transporters.

- Cask Transfer Facility: At the Cask Transfer Facility, the MPCs will be removed from the Transfer Casks and placed into permanent storage casks, or "overpacks". Each overpack is about nineteen feet high and twelve feet in diameter, and consists of steel and metal layers. The overpacks are designed to provide radiation shielding while allowing passive cooling of the spent fuel.

[1] 10 CFR 72.106 establishes federal requirements for the controlled area around an ISFSI. These requirements are based primarily on limiting the exposure a individual may be subject to from the stored fuel's radiation, but also include a requirement that the minimum distance from the stored waste to the boundary be at least 100 meters.

- Storage area: After the casks are placed in the overpack, they would be moved to the long-term storage area. This will consist of up to seven reinforced concrete storage pads, each measuring 68 feet by 105 feet and 7.5 feet thick. Each storage pad would hold up to 20 storage casks bolted into place with sixteen 2½-inch thick bolts. The total area covered by the storage pads would be up to about 500 feet by 105 feet. These pads will be surrounded by a security fence located within the existing high security perimeter fence around the Diablo Canyon power plant complex. Once installed, the casks are designed to require little, if any, ongoing maintenance – they have no moving parts and are designed to dissipate waste heat from the stored fuel into the air.

  Construction of the storage area will require grading up to about 150,000 cubic yards of material from a hillside that was previously disturbed during original construction of the power plant in the 1980s. This area had been graded before to provide level areas for a switchyard, water supply reservoir, and other infrastructure associated with the Diablo Canyon power plant complex.

- Soil Disposal Areas: Soil removed during construction of the ISFSI storage area will be placed on any of three soil disposal areas. All are within the Diablo Canyon high security area. One of the disposal sites is on an existing storage yard about one hundred yards north of the storage area, and the other two are on existing parking areas about a quarter-mile and a half-mile, respectively, from the storage area.

- Temporary concrete batch plant: A temporary concrete batch plant will be built near the Cask Transfer Facility to provide concrete for the storage pads.

PG&E is proposing to construct the storage area in two phases – Phase I would involve the majority of construction, including the road improvements, the full amount of grading, the construction of two of the seven concrete storage pads, and construction of a concrete batch plant. These first two pads would provide sufficient space to store the fuel currently being stored in the existing storage pools. Phase II would involve constructing up to five additional storage pads and installing storage casks as they are needed to store fuel generated during the remainder of the power plant's currently-licensed operations, which extend to 2025. Most of the work, and most of the potential for impacts requiring review for conformity to provisions of the LCP and Coastal Act would occur during Phase I. Similarly, most of the work and those potential impacts would occur regardless of whether Phase II would be built.

Most project construction activities will be supervised and monitored by the County. As part of its adopted CEQA findings, the County identified numerous mitigation measures meant to ensure project activities will not result in adverse impacts to air quality, water quality, sensitive habitat, and other significant coastal resources. These measures are more fully described in the Final EIR and the County's adopted findings and will be included in plans that PG&E must submit as part of the County's review of a construction permit.

Key measures to be included in the County's construction permit include the following:

- Identification of specific measures to revegetate areas disturbed during construction activities. These are further discussed in Section 4.4.3 of these findings, but include measures such as preparing the soil to allow plant germination and success, using an appropriate planting mix of native species, monitoring the revegetated areas for success, minimizing soil erosion from the planted areas, and replanting as necessary.

- Submittal of detailed sediment and drainage control plans evaluating the runoff expected from the various project areas and describing the Best Management Practices that will be used to control and treat site runoff to prevent exceedances of water quality parameters. These are further discussed in Section 4.4.4 of these findings, but include measures such as installing properly-sized collection and treatment systems, controlling the flow and velocity of site runoff, coordinating the project's drainage control system with the existing system at the Diablo Canyon complex, and other similar measures.

- Submittal of a plan to be prepared by a County-qualified archaeologist to ensure that any archaeological or cultural resources found during the project are properly protected, reported, recorded, and evaluated. The archaeologist will have the ability to stop project activities that may affect such resources, and will be responsible for notifying both the County and local Native American representatives.

- Minimization of impacts related to air quality, noise, traffic and circulation, and other issues of concern at and near the project site.

Many of these measures will be subject to oversight by a County-approved environmental monitor, who will be responsible for directing project activities to avoid and minimize many of the potential adverse environmental effects of concern. This oversight and the mitigation measures will be implemented during major parts of project construction activities, such as grading, road work, and construction of the main elements of the ISFSI.

The County will ensure the project implements these measures through review and issuance of a construction permit. **Special Condition 1** requires PG&E to submit to the Executive Director an approved construction permit from the County prior to starting construction, which will ensure that the measures identified in the project EIR and elsewhere in these findings will allow the project to conform to a number of LCP and Coastal Act requirements, as described in several sections later in these findings.

Project Decommissioning: If the spent fuel is moved to another facility, the ISFSI would be decommissioned. Decommissioning would occur only after all fuel is removed from the site and would involve decontamination and disposal of the remaining materials as appropriate. The current proposed project does not address decommissioning due in part to the uncertainty about when it would occur and how it would be regulated at that time.

4.2 COASTAL COMMISSION JURISDICTION

Permit and Appeal Jurisdiction: The project is within the County of San Luis Obispo coastal zone and is subject to a County coastal development permit issued pursuant to its certified Local Coastal Program. The County also served as the CEQA lead agency in preparing the project's Environmental Impact Report. Pursuant to several provisions of Coastal Act Section 30603(a), the proposed project is in the Coastal Commission's appeal jurisdiction, as parts of it are within 300' of coastal waters and a coastal bluff, within a sensitive coastal resource area, and it a part of a major energy facility.

On April 20, 2004, the County of San Luis Obispo Board of Supervisors conditionally approved Coastal Development Permit #D010153D for construction and operation of the facility. On May 14, the Coastal Commission received the County's Notice of Final Action and associated records to start the 10-working-day appeal period, which ended May 26, 2004. On May 25 and 26, 2004, appeals were filed by PG&E, Mothers For Peace, the Santa Lucia Chapter of the Sierra Club, and Commissioners Nava and Wan.

De Novo Appeal Procedures and Standard of Review: On July 15, 2004, the Coastal Commission determined that appeals of the coastal development permit issued by San Luis Obispo County for this proposed development raised substantial issue regarding conformance with the County's certified Local Coastal Program. As set forth in Section 13115(b) of the California Code of Regulations, the Commission is to then consider the merits of the proposed development in a *de novo* hearing.

The general procedures for Commission action at the *de novo* hearing stage are typically the same as if the coastal development permit application had been submitted directly to the Commission. However, pursuant to Coastal Act Section 30604(b), the standard of review is the certified Local Coastal Program rather than Chapter 3 of the Coastal Act. Additionally, pursuant to Coastal Act Section 30604(c), the standard of review for projects such as this one, proposed to be located between the nearest public road and the sea, also includes the public access and recreation policies of Chapter 3 of the Coastal Act (Sections 30210-30224). Further, at the time of the *de novo* hearing, any person may testify before the Commission, unlike the substantial issue hearing at which the only persons that may testify are the applicant, those who opposed the application before the local government (or their representatives), or the local government.

Federal permits and federal pre-emption: The ISFSI is also subject to a site-specific license to be issued by the federal Nuclear Regulatory Commission (NRC). The NRC is currently reviewing PG&E's license application to allow spent fuel from Diablo Canyon to be stored at the ISFSI. This license would require specific performance standards, allowable operating conditions at the facility, including design specifications, testing requirements, security measures, and other measures. The license currently under consideration by the NRC would be issued for twenty years, with an option for the applicant to request a license extension for an additional twenty years. PG&E's project description characterizes the project as a temporary facility that will be in place for twenty to forty years, but also recognizes that it may be in place for a longer period (see Section 4.3, Other Project-Related Issues, below).

The NRC has exclusive jurisdiction over radiological aspects of the proposal. The state is preempted from imposing upon operators of nuclear facilities any regulatory requirements concerning radiation hazards and nuclear safety. The state may, however, impose requirements related to other issues. The U.S. Supreme Court, in *Pacific Gas and Electric Company v. State Energy Commission, 461 U.S. 190, 103 S.Ct. 1713 (1983)*, held that the federal government has preempted the entire field of "radiological safety aspects involved in the construction and operation of a nuclear plant, but that the states retain their traditional responsibility in the field of regulating electrical utilities for determining questions of need, reliability, costs, and other related state concerns." The facility's current and proposed possession, handling, storage, and transportation of spent nuclear fuel are therefore precluded from state regulation. The Coastal Commission findings herein address only those state concerns related to conformity to applicable policies of the Coastal Act, and do not evaluate or condition the proposed project with respect to nuclear safety or radiological issues.

4.3 OTHER PROJECT-RELATED ISSUES

The need for the ISFSI, its eventual size, and the length of time it will be on the site are all affected by issues outside the immediate review for conformity to LCP and Coastal Act requirements; however, many of these issues affect how the ISFSI will conform to those requirements. The primary issues are described below.

Lack of a permanent storage facility: The need for onsite storage of spent nuclear fuel is a consequence of the United States not yet establishing a permanent and safe repository for spent fuel and other nuclear materials. Several decades ago, the federal government established its responsibility to site, construct, and operate such a repository; however, the repository has not been built due to a number of issues.

In 1977, the federal government announced it would take on the responsibility for spent fuel from all nuclear power plants in the U.S. In 1982, the Nuclear Waste Policy Act required the Department of Energy to accept spent fuel for permanent disposal by 1998. In 1987, after studies of several different potential sites, the Act was amended to make a site in Yucca Mountain, Nevada the only site undergoing further consideration. Over the next several years, studies of Yucca Mountain continued, and the Department of Energy intended to have it constructed and operating by 2010. The facility would accept spent fuel from power plants around the country in priority order, based largely on the age of the spent fuel – generally, the older the fuel, the earlier it would be accepted. Based on this priority system, material from the Diablo Canyon power plant was to be accepted starting about 2017.

The Yucca Mountain facility is partially constructed and was scheduled to start accepting materials in 2010; however, in July of this year, a decision by the District of Columbia Circuit Court (*Nuclear Energy Institute, Inc. v. Environmental Protection Agency, D.C. App. 2004, No.01-1258*) found that the EPA had improperly set the facility's design standard for radioactive exposure well below what had been determined necessary by the National Academy of Sciences

and what had been required by Congress[2]. This court decision has resulted in significant doubt over when or whether the Yucca Mountain facility will open at all. The decision, which the Nuclear Energy Institute has appealed to the U.S. Supreme Court, results in the need for EPA to either reset its design standard and change the facility design, or for the federal government to amend the required design standard EPA must meet at Yucca Mountain. Additionally, there are several other as of yet unresolved cases involving the proposed Yucca Mountain facility related to water rights, transportation, and other issues.

The delays in constructing the Yucca Mountain facility have occurred for a number of years, due to various study findings, design changes, the recent court decision, and other issues. The uncertainty about the facility's suitability has resulted in recognition by the NRC and nuclear facility operators that they will need to provide interim storage for spent fuel at the various nuclear power plants around the country. Without a permanent storage facility in place, many nuclear facilities have been running low on storage capacity. Most power plants use storage pools to store spent fuel for several years after it is initially removed from the power generating unit; however, pools at many facilities have run out or will soon run out of storage space. In some instances, the pools can be "re-racked" to double or triple the amount of storage available, although this approach is generally seen as an interim measure and less desirable than constructing an alternative facility, such as dry cask storage. The alternatives analysis for this ISFSI project reviewed re-racking and found that it was feasible but less desirable due to the increased safety concerns caused by the required handling and re-handling of the spent fuel.

To date, dry cask storage systems have been built at sixteen facilities around the country. The NRC has approved several different designs, all generally consisting of storage casks consisting of various layers of metal, reinforced concrete, and other materials that are placed horizontally or vertically on thick reinforced concrete pads.

An additional uncertainty about the Yucca Mountain facility is that several recent power plant re-licensings by the NRC will result in more spent fuel being generated than the facility was designed to hold. Congress limited storage at Yucca Mountain to 70,000 tons of nuclear material, which was the amount estimated to be generated by power plants through 2010. Since approval of the Yucca Mountain design, the NRC has re-licensed fifteen nuclear power plants, extending their operating life and increasing the amount of spent fuel they will generate. The 20-year license extension for each of these fifteen power plants is estimated to produce an additional 9,000 tons of high-level waste needing permanent storage[3]. This additional material will require

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[2] In 2002, Congress determined that the facility must meet an "individual risk standard" for exposure to radioactive elements "based on and consistent with" the recommendations of the National Academy of Sciences. The Academy determined that the facility required designs ensuring exposures would not be exceeded for tens to hundreds of thousands of years. The EPA, however, set the exposure standard at 10,000 years. The court determined the EPA's selection of the 10,000 year standard was not "based upon and consistent with" the recommendations of the National Academy of Sciences, as had been required by Congress.

[3] In addition, there are currently eighteen other power plants with re-licensing requests before the NRC. Approval of these requests would result in the need for additional permanent storage capacity for spent nuclear fuel.

either that Congress authorize Yucca Mountain be redesigned to hold more material or that the material be stored elsewhere.

Related Issues at Diablo Canyon: The Diablo Canyon power plant includes two wet storage pools in which the spent fuel rods must be stored for at least five years after they are removed from the generating units. The pools were originally configured to hold 257 fuel assemblies, but were modified in the late 1980s to increase their storage capacity to 1324 fuel assemblies. PG&E estimates that the pools will reach capacity in 2006, at which point three options were considered – construct the ISFSI and move older fuel from the pools into dry storage, re-rack the pools again to provide several additional years of storage capacity, or shut down the power plant due to lack of storage capacity for the additional spent fuel it would generate.

Proposed Steam Generator Replacement: The power plant's Unit 1 is currently licensed by the NRC until 2021 and Unit 2 is licensed until 2025. However, PG&E has determined that structural wear and tear on the power plant's steam generating units have resulted in the need to replace them no later than 2014. Its proposal to increase electricity rates to pay for replacement of these units (estimated by PG&E to be approximately $700 million) is currently under review by the California Public Utilities Commission (PUC). The PUC is currently scheduled to determine in September 2005 whether PG&E may recover the costs of these generating units through an electrical rate increase. If the steam generators are not replaced, the power plant would shut down sometime before 2014.

Potential Extension of the Power Plant License: If the PUC approves the rate increase for new steam generators, the new generators would likely be capable of operating past the end of the Diablo Canyon's current license period. PG&E may request a new or extended license from the NRC that would allow the power plant to operate past 2025. Extending the operating period would also increase the amount of spent fuel generated, which would therefore result in the need for additional spent fuel storage. At this time, PG&E has not applied for a new or extended license, so for purposes of these findings, the power plant is assumed to operate until no later than 2025.

NPDES Permit: The Central Coast Regional Water Quality Control Board has scheduled for early 2005 its consideration of the NPDES permit for Diablo Canyon's cooling water intake and discharge. The facility is currently authorized to take in and discharge up to about 2.7 billion gallons per day of ocean water for cooling. Over the past several years, the Regional Board has determined that discharge of this cooling water exceeds the thermal standards of the California Ocean Plan, and Regional Board staff has been working with PG&E and other parties to resolve these exceedances. The Board has also raised concerns related to the significant numbers of marine organisms entrained by the power plant's cooling system.

The Regional Board is developing a Memorandum of Agreement (MOA) with PG&E to resolve these issues. Previous draft versions of an MOA have considered mitigation measures such as establishing marine protected areas along the Central Coast, establishing a conservation easement over most of the northern portion of the Diablo Canyon lands and implementing water quality Best Management Practices on these lands, constructing offshore reefs to provide habitat,

and others; however, at this time, there is not yet agreement as to how to resolve these issues, and there is no draft MOA currently available for public review. The eventual resolution of these NPDES-related issues, through an MOA or other means, could result in changes to the power plant operations or could result in changes to nearby water quality or nearby allowable land uses.

Alternatives to the Proposed Project: Several alternatives to the proposed ISFSI were evaluated in PG&E's ISFSI license application to the NRC and during the County's CEQA review.

- "Re-rack" existing storage: This alternative would replace existing fuel storage racks used in the pools with new racks that allow fuel to be stored more densely. This alternative would provide additional storage for fuel generated until the end of the power plant's current operating license, but would involve extensive re-handling of the fuel currently stored in the pools. This extensive re-handling is considered to increase the risk of accidental release of radioactive materials.

- Ship fuel to other facilities: This alternative considered whether it would be feasible to send spent fuel to other facilities that may be available. However, and as noted above, just as there is no permanent federal storage facility, there are no available private facilities. Several have been proposed but are not licensed or built, and several that have been built, generally by other utilities, anticipate having sufficient storage for only their own material, not material generated elsewhere. Even if facilities were available, transportation of the spent fuel from Diablo Canyon would raise significant issues that would required substantial additional evaluation and permitting.

- Constructing an additional onsite storage pool: This alternative would involve a pool similar to the two existing pools on site. An additional pool could be sized to provide storage for about 1,600 spent fuel assemblies, which would provide several more years of storage capacity. This alternative would require extensive construction and because the pool would have to be located further from the reactors, it would require spent fuel first be placed in transfer casks to be moved to this new pool

PG&E determined that of the alternatives considered, the ISFSI is the preferred and optimum project. It also believes that, despite the increased safety concerns, re-racking would be considered a possible alternative if the ISFSI was not approved or could not be built in time to provide storage by 2006.

Consequences of these Issues: The length of time the ISFSI will remain in place and the eventual amount of material it will store depend largely on resolution of the issues above. The primary consequence of these currently unresolved issues is that it must be presumed that the ISFSI will remain on site for the foreseeable future, and far longer than the life of the power plant.

Time Period: Regarding the length of time the ISFSI would exist at the site, while an ISFSI license issued by the NRC would be for 20 years with a possible 20 year license extension, the current lack of a suitable permanent or alternative storage facility suggests that the ISFSI will remain longer. The length of time the proposed ISFSI remains in place is almost entirely dependent on the outcome of the federal government's success in either completing the Yucca Mountain facility or locating, designing, and operating another long-term storage facility to store nuclear material from Diablo Canyon as well as from other nuclear power plants around the country. At this time, because there is no resolution to the concerns about Yucca Mountain and no other acceptable site in place, there is no assurance that PG&E will be able to transfer material to the Yucca Mountain facility or to any other facility at the end of the twenty- to forty-year ISFSI license period. Even if the ISFSI were to remain at Diablo Canyon only for its twenty or forty-year license period, present circumstances dictate that the power plant will shut down before the expiration of either license period. Additionally, the alternatives analyses done for the project's Environmental Impact Report (EIR) and for the NRC conclude that alternative storage sites or alternative storage methods are either infeasible, unavailable, or would involve greater potential risk to human health or the environment.

Based on the current uncertainty about whether or when a permanent storage facility might be available, and whether such a facility would have the capacity to store material from Diablo Canyon, these findings presume that the proposed facility will remain in place for the foreseeable future rather than only a 20- or 40-year period. This presumption leads to the conclusion that the perpetual presence of the ISFSI, rather than the relatively limited useful life of the power plant, will be the factor controlling public access to the area's coastline. Therefore, without evidence of a feasible and available alternative permanent storage site, the Commission must presume that the facility will remain in perpetuity, and the findings and conditions herein are based on this presumption. Should the situation change, the Commission also recognizes that the project proponent may request an amendment to this permit if so desired.

Amount of Material To Be Stored: The eventual size of the ISFSI is similarly dependent on how the above issues are resolved. If, for example, the PUC does not support PG&E's request for a rate increase to pay for new steam generators, Diablo Canyon would likely stop generating spent fuel before 2014, and the ISFSI would be smaller than proposed. Alternatively, if PG&E gains the necessary approvals to replace the existing steam generators, the ISFSI would provide the storage necessary for spent fuel generated until the end of the current operating license periods of 2021 and 2025. Additionally, if storage capacity becomes available elsewhere at a permanent storage facility, PG&E may be able to move all or some of its spent fuel and reduce the overall size of the ISFSI.

PG&E is proposing to construct the facility in two phases – an initial phase to provide storage for the spent fuel currently stored in the pools, and a second phase to provide storage for fuel generated during the remainder of the plant's current operating license. This approach allows PG&E to address its immediate storage needs and to construct fewer storage pads if they are not needed. Further, the project is limited to storing spent fuel from the Diablo Canyon power plant, so any excess storage capacity could not be used to store material from other facilities without additional review and approval at the federal level and through additional coastal development

permit review. The most significant potential impacts requiring review for conformity to provisions of the LCP and Coastal Act would occur largely during the first phase – for example, the bulk of the grading and soil disposal needed to create the storage area, the construction of the concrete batch plant, and the road upgrade would all occur during the first phase regardless of whether the second phase was implemented. These findings, therefore, are based on review of both phases of the project for conformity to Coastal Act and LCP requirements. To provide the necessary oversight for Coastal Act conformity during both project phases, several of the special conditions require monitoring and reporting during all of project construction. Regardless of which of the above scenarios occur, an ISFSI of any size will require measures that will impose some level of security that prevents or limits access to some portion of the shoreline.

4.4 CONFORMITY TO APPLICABLE POLICIES OF THE COASTAL ACT AND THE CERTIFIED LOCAL COASTAL PROGRAM

4.4.1 Public Access and Recreation

4.4.1.1 Applicable LCP Provisions and Coastal Act Policies

Section 23.04.420 states, in relevant part:

> *Development within the coastal zone between the first public road [and] the tidelands shall protect and/or provide coastal access as required by this section. The intent of these standards is to assure public rights of access to the coast are protected as guaranteed by the California Constitution. Coastal access standards are also established by this section to satisfy the intent of the California Coastal Act.*

Section 23.04.420(3) states, in relevant part:

> *Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:*
> *(A) Access would be inconsistent with public safety, military security needs or the protection of fragile coastal resources; or*
> *(B) The site already satisfies the provisions of subsection (4) of this section; or*
> *(C) Agriculture would be adversely affected…*

Section 23.04.420(4), states, in relevant part:

> *(A)(ii): In rural areas where no dedicated or public access exists within one mile, or if the site has more than one mile of coastal frontage, an accessway shall be provided for each mile of frontage…*
> *(A)(iv): The applicable approval body may require accessways in addition to those required by this section where the approval body finds that a proposed development would, at the time of approval or at a future date, increase pedestrian use of any adjacent accessway beyond its capacity.*
> *(B) Accessways shall be a minimum width of five feet in urban areas and ten feet in rural areas.*
> *(C) All new development shall provide a lateral access dedication of twenty-five feet of dry sandy beach available at all times during the year. Where topography limits the dry sandy beach to less than twenty-five feet, lateral access shall extend from the mean high tide to the toe of the bluff.*

Section 23.04.420(5) states:

> *The type and extent of access to be dedicated, and/or constructed and maintained, as well as the method by which its continuing availability for public use is to be guaranteed, shall be established at the time of land use permit approval, as provided by this section.*

(A) Dedication: shall occur before issuance of construction permits or the start of any construction activity not requiring a permit;
(B) Construction of improvements: shall occur at the same time as construction of the approved development, unless another time is established through conditions of land use permit approval;
(C) Opening access for public use: no new coastal access required by this section shall be opened or otherwise made available for public use until a public agency or private association approved by the county agrees to accept responsibility for maintenance of the accessway and any liability resulting from public use of the accessway;
(D) Interference with public use prohibited: following an offer to dedicate public access pursuant to subsection (5)(A) of this section, the property owner shall not interfere with use by the public of the areas subject to the offer before acceptance by the responsible entity.

Section 23.04.420(7) states:

Where public coastal accessways are required by this section, approval of a land division, or land use permit for new development shall require guarantee of such access through deed restriction, or dedication of right-of-way or easement. Before approval of a land use permit or land division, the method and form of such access guarantee shall be approved by county counsel, and shall be recorded in the office of the county recorder, identifying the precise location and area to be set aside for public access. The method of access guarantee shall be chosen according to the following criteria:
(A) Deed restriction: shall be used only where an owner, association or corporation agrees to assume responsibility for maintenance of and liability for the public access area, subject to approval by the planning director;
(B) Grant of fee interest or easement: shall be used when a public agency or private organization approved by the planning director is willing to assume ownership, maintenance and liability for the access;
(C) Offer of dedication: shall be used when no public agency, private organization or individual is willing to accept fee interest or easement for accessway maintenance and liability. Such offers shall not be accepted until maintenance responsibility and liability is established;
(D) Procedures for open space easements and public access documents: pursuant to Section 13574 of Title 14 of the California Administrative Code, all land use permits and tentative subdivision maps subject to conditions of approval pertaining to public access, open space, agricultural or conservation easements shall be subject to the following procedures:
All legal documents shall be forwarded to the executive director of the coastal commission for review and approval as to the legal adequacy and consistency with the requirements of potential accepting agencies,
The executive director of the coastal commission shall have fifteen working days from the receipt of the documents in which to complete the review and to notify the applicant and the county of recommended revisions, if any,

If the executive director of the coastal commission has recommended revisions to the applicant, the land use permit shall not become effective pursuant to Section 23.02.034(4) of this title until the deficiencies have been resolved to the satisfaction of the executive director,
The land use permit may become effective (Section 23.02.034(4)) upon expiration of the fifteen working day period if the coastal commission has not notified the applicant and the county that the documents are not acceptable.

Section 23.04.420(8) states:

Coastal accessways required by this section or by planning area standards of the land use element shall be physically improved as provided by this subsection. The need for improvements to any accessway shall be considered as part of land use permit approval, and responsibility for constructing the improvement shall be borne by the developer or consenting public agency. After construction, maintenance and repair may be accomplished by a public agency or by a private entity approved by the applicable review body taking action on the project land use permit.
(A) Typical Improvements That May Be Required. The extent and type of improvements and support facilities that may be required may include but are not limited to drainage and erosion control measures, planting, surfacing, structures such as steps, stairways, handrails, barriers, fences or walls, benches, tables, lighting, parking spaces for the disabled, safety vehicles or general public use, as well as structures such as restrooms or overlooks.
(B) Type and Extent of Improvements -- Required Findings. The improvements described in subsection (8)(A) of this section shall be required to an extent where such improvements:
Are necessary to either assure reasonable public access, protect the health and safety of access users, assure and provide for proper long-term maintenance of the accessway, or protect the privacy of adjacent residents;
Are adequate to accommodate the expected level and intensity of public use that may occur;
Can be properly maintained by the approved maintenance entity;
Incorporate adequate measures to protect the privacy and property rights of adjoining property owners and residents.

Section 23.04.420(9) states:

Where required through land use permit or tentative subdivision map approval, signs installed in conjunction with accessways shall conform to the following standards:
(A) Sign Design. Accessway signs shall use white letters on a brown background. The number and dimensions of signs are to be determined through land use permit review.
(B) Identification Signs. Shall contain the words "COASTAL ACCESS" in three-inch letters at the top of the sign, as well as the name of the accessway, if any, and indicate if there are any hazards or rare or endangered species.

> *(C) No Trespass Signs. Shall contain the words "RESPECT PRIVATE PROPERTY - NO TRESPASSING".*
> *(D) Hazard Signs. Shall be located at the tops of bluffs or cliffs.*
> *(E) Parking Area Signing. Each parking area shall be posted in a location visible from the public road with a sign that is between two and four square feet in area, stating: "PARKING FOR PUBLIC COASTAL ACCESS". Lettering shall be a minimum of two inches high and clearly legible.*

Section 23.04.420(11) states:

> *In reviewing a proposed accessway, the applicable review body shall consider the effects that a public accessway may have on adjoining land uses in the location and design of the accessway. When new development is proposed, it shall be located so as not to restrict access or to create possible privacy problems. Where feasible, the following general criteria shall be used in reviewing new access locations, or the location of new development where coastal access considerations are involved:*
> *(A) Accessway locations and routes should avoid agricultural areas, sensitive habitats and existing or proposed residential areas by locating near the edge of project sites;*
> *(B) The size and location of vertical accessways should be based upon the level and intensity of existing and proposed access;*
> *(C) Review of the accessway shall consider: safety hazards, adequate parking provisions, privacy needs of adjacent residences, adequate signing, and levels of improvements necessary to provide for access;*
> *(D) Limiting access to pass and repass should be considered where there are nearby residences, where topographic constraints make the use of the beach dangerous, where there are habitat values that can be disturbed by active use.*

Section 23.07.178(3) states, in relevant part:

> *Coastal Access. Coastal access shall be monitored and regulated to minimize impacts on marine resources. If negative impacts are demonstrated, then the appropriate agency shall take steps to mitigate these impacts, including limitations of the use of the coastal access.*

Coastal Act Policies: The proposed development would be located between the first public road and the sea; therefore, pursuant to Coastal Act Section 30604(c), the Coastal Act's public access and recreation policies (Sections 30210 – 30224) apply to this proposed project. These Coastal Act policies serve as the basis for the LCP provisions cited above.

Additional legal requirements: In addition to the applicable LCP and Coastal Act policies, and pursuant to state and federal law, public access established as part of a permit decision must generally be based on an appropriate nexus between the proposed project's effects on access and the measures taken to establish access – that is, there must be a credible relationship between any loss of access caused by the project and the measures required to replace or regain that access. Further, those measures must be roughly proportional to the project's effects.

4.4.1.2 Background and Existing Access

Components of the proposed project will cover about nine acres within the approximately 760 acres of the high security area surrounding the Diablo Canyon power plant complex. This federally-required high security area currently protects the nuclear power plant and will be used to protect the ISFSI. This 760 acres includes about one-and-one-half miles of coastline. Federal requirements prohibit public access within this area, so there is no existing coastal access at the proposed ISFSI site. Access is further restricted due to an offshore security zone prohibiting access to coastal waters within 2,000 yards of the power plant (approximately 1.1 miles).

Beyond the high security area, PG&E owns or controls approximately 12,000 adjacent acres (see Exhibit 2). These lands cover about twelve miles of coastline, from near Avila Beach on the south to Montana de Oro State Park on the north. About 4,000 acres of these lands are within the coastal zone. These findings refer to those lands within the coastal zone as the "Diablo Canyon lands". The southern portion of these lands within the coastal zone is generally rugged with steep topography. The northern portion includes more relatively open and level coastal terraces. The shoreline at the northernmost end near the State Park includes several beaches in large coves, as well as numerous rocky points and outcrops. PG&E manages these lands as open space, for both row crop and grazing agricultural operations, for habitat, and as an additional security buffer around the federally-required high security area. These lands include significant habitat for a variety of sensitive species. Several of the beaches provide haul out areas for harbor and elephant seals or pupping areas for harbor seals, and there is a local population of California sea otters. Many of the uplands are designated "Sensitive Resource Areas" in the County LCP, and include significant habitat for several endangered or threatened plant and animal species. The area also includes several significant archaeological sites.

There are a number of existing roads on these lands, though none are open to the public. The primary road, Diablo Canyon Road, is a paved two-lane, approximately seven mile-long road running from the southern property entrance at Port San Luis Harbor to the power plant complex. This is the main access road into the property and it is used primarily by the power plant employees. Just north of the southern entrance is an unpaved spur road off the primary road that leads to the Point San Luis Lighthouse. The northern portion of the Diablo Canyon lands between Montana de Oro State Park and the power plant complex includes several unpaved roads. The primary road in this area serves as an emergency exit route from the power plant area to a security gate at the State Park boundary. This gate prevents public access to these Diablo Canyon lands. Along with this primary road, there is a small network of unimproved farm roads, including some that run along the top of the coastal bluffs for about four miles.

The only trail currently providing public access on the Diablo Canyon lands is the 3.7 mile-long Pecho Coast Trail. It runs from the southern entrance of the Diablo Canyon lands to the now-retired lighthouse at Point San Luis and then further upcoast to just beyond Rattlesnake Canyon (see Exhibit 4). The lighthouse, originally constructed in 1890 and operated by the U.S. Coast Guard, was retired in 1974 and then acquired by the Harbor District. It is now being restored by a non-profit group, the Point San Luis Lighthouse Keepers, to provide access and education. The lighthouse is one of the main attractions along the trail.

The trail provides blufftop access only with no direct beach access due to the steep coastal bluffs, the narrow beaches, and the sensitive habitats in this section of the coast. There are a number of improvements along the trail, such as benches, garbage cans, portable toilets, and it includes several marine mammal observation areas. This trail is a product of the public access requirements for Coastal Development Permit No. 4-82-593 issued by the Commission for construction of PG&E's Simulator Building at the Diablo Canyon complex. That permit required PG&E to develop within six years of permit issuance a public access plan to provide coastal access within the Diablo Canyon lands. The resulting Pecho Coast Trail Accessway Management Plan provides managed access to the Pecho Coast Trail. The trail opened in 1994 and currently provides twice-weekly, docent-led, day use-only hikes for up to twenty hikers per hike, for a total of up to 2080 hikers per year. Portions of the trail may close at various times during the year due to sensitive resource issues, such as seal pupping season, or to allow necessary maintenance. Hikers are required to pre-register and are provided a pre-visit information package of the guidelines associated with the access, including parking, trail rules and restrictions, security concerns, and other aspects. The Plan also included a payment by PG&E of $195,000 into an escrow account to pay for developing and maintaining the trail improvements. The Plan recognizes the relatively unspoiled nature of the coastline along the Diablo Canyon lands, and includes measures to avoid or limit public safety hazards and to minimize adverse effects on sensitive coastal resources, nearby agricultural operations, and archaeological sites.

Areas to the north and south of the Diablo Canyon lands provide significant and important public access to the coast. The shoreline at the southern end of these lands is within the Port San Luis Harbor District. Coastal amenities at the Harbor District include Point San Luis Beach, parking, a restaurant, recreational vehicle parking, and the boating and fishing facilities associated with the Port San Luis commercial pier. The Harbor District's offshore area, in San Luis Bay, is used for boating, boat mooring, fishing, and other water-oriented activities. The Port Master Plan contains a Coastal Access Plan, which describes a number of goals, policies, and programs, and includes specific policies to provide access and support to the Pecho Coast Trail and Point San Luis Lighthouse. The northern end of the Diablo Canyon lands borders Montana de Oro State Park. The Park includes campgrounds and day use areas, and has a visitor center along with several hiking, equestrian, and mountain bike trails. There are a number of primarily two-lane roads serving the areas around the Diablo Canyon lands. The roads providing access from inland areas to the shoreline are often crowded and slow, particularly during summer weekend traffic to the beach areas. The project is subject to mitigation measures identified in the EIR that restricts project-related traffic during peak commuting times and summer weekends and requires vanpools and timed deliveries of project-relate equipment.

The Diablo Canyon lands additionally play an important role in the implementation of the California Coastal Trail. The planning documents for the Coastal Trail identify the Diablo Canyon lands as an important link between accessways to the north and south. The planning map shows a potential link along the Diablo Canyon shoreline to be designed consistent with security needs of the Diablo Canyon power plant complex.

4.4.1.3 Analysis of Consistency With Applicable Policies and Legal Requirements

Coastal Act Policies and LCP Provisions: Coastal Act policies and LCP provisions require public access to the shoreline be provided as part of this proposed development. Coastal Act Section 30210 requires that maximum public access opportunities be provided, consistent with public safety, private property rights, and protection of natural resource areas. It further provides in Section 30211 that development not interfere with the public's right of access to the sea acquired through use or legislative authorization. Both the Coastal Act and Section 23.04.420 of the LCP require that public access be provided for development between the first public road and the sea. Nearly all the Diablo Canyon lands, including the high security area where ISFSI components would be sited, are between the first public road and the sea. LCP Section 23.04.420(3) recognizes that such access might not be required when it would be inconsistent with public safety, military security needs, or protection of fragile coastal resources, or would adversely affect agriculture. Because the shoreline at its closest point to the ISFSI development is within the high security zone, public access to that immediate area would be inconsistent with public safety; however, it is feasible to provide access to the shoreline in other parts of the Diablo Canyon lands if it is managed in a way to ensure security and public safety and to protect fragile coastal resources and agriculture. This is further supported by LCP Section 23.07.178(3), which recognizes the need for coastal access to minimize impacts to marine resources. These access provisions are additionally bolstered by LCP Section 23.04.420(11), which recognizes that access may be required even when it is subject to the concerns identified above. Therefore, the Coastal Act and the LCP require access be provided, as feasible, even with, and in recognition of, the safety, security, agricultural and sensitive habitat concerns in the area. While the Commission is pre-empted due to federal law from requiring access within the project site's 760-acre security zone, access is feasible in areas outside that zone, either in the adjacent Diablo Canyon lands under PG&E's ownership or in other nearby coastal areas. Access to Diablo Canyon lands can be provided consistent with public safety, military security, agricultural and other coastal resource concerns, as is evidenced by the Pecho Coast Trail described above, which allows access in an area where these issues are of concern[4].

Because there is no access in the immediate area of the ISFSI, the provision of LCP Section 23.04.420(3), which allows exemptions to access requirements if other adequate access exists nearby, does not apply to this project. Other than the limited managed access provided by the Pecho Coast Trail, which ends about four miles south of the ISFSI area, there has been no public access available to or along these nearby twelve miles of coastline during the existence of the Diablo Canyon power plant. The shoreline access at Montana de Oro State Park is about four miles north of the ISFSI area. Along with preventing access to the 1.5 miles of shoreline within the ISFSI's high security zone due to federal requirements, PG&E has largely prevented access to much of the public trust tidelands in the remaining 10.5 miles of the Diablo Canyon shoreline due to concerns about security. This can be contrasted with the areas north and south of the Diablo Canyon lands, which are popular coastal destinations providing about one-and-a-half million daily visits each year. Further, LCP Section 23.04.420(4) specifies that accessways must

[4] In comparison, we note that managed public access exists within several dozen yards of the power plants and spent fuel facilities at the two other coastal nuclear facilities in California – San Onofre and Humboldt Bay.

be provided for developments where there is no access within one mile or if the development site has more than one mile of coastal frontage. Both of these characteristics apply to this development. This same section of the LCP also states that additional access may be required if future pedestrian use is anticipated to increase beyond the capacity of these minimum access requirements.

When access is required, LCP Section 23.04.420(5) requires that the type and extent of access be determined at the time a permit is issued, that dedication of the access occur before any construction permits are issued, and that improvements required as part of that access be constructed concurrently with the approved development. This is required even though the lost access to be caused by the ISFSI will occur some time in the future. While for this proposed project the time lag between approval of the development and its effects on access is longer than most, it is a difference of degree rather than kind. Coastal development permits commonly require access be provided immediately as a condition of approval, even though the development may not be built for some period of time. Most permits, in fact, include a standard condition with a built-in allowable time-lag of two years between the time a permit is approved with access requirements and the time the approved development must start construction. In another example, the Commission recently approved a permit for a seawall in Monterey (CDP #03-02-24 – Ocean Harbor House, in October 2004) that required payment now of an in-lieu fee to replace lost access that would be caused by that seawall over a fifty-year period.

The requirements of the LCP and Coastal Act clearly establish that public access must be provided as part of this development. The type and extent of access required is to be established at the time of permit approval and provided concurrent with the proposed project. It is also evident that while access is not appropriate in the immediate vicinity of the ISFSI due to security concerns, it may be provided nearby in a manner protective of security, public safety, and other issues of concern. It is therefore appropriate to require the necessary access for the proposed project be provided through a combination of access on the adjacent Diablo Canyon lands and on other adjacent or nearby coastal properties.

4.4.1.4 Coastal Access Required Due to the Development

The findings below illustrate that the proposed development will cause a future loss of public access to approximately one-and one-half miles of coastline. The findings also establish that the nexus between the development and the loss of access caused by the development is the high security zone that will be required around the development in perpetuity. A rough proportionality test to determine the level of lost access caused by the ISFSI concludes that the proposed development will result in a loss, in present value, of approximately 100,000 visitors per year, or about 275 per day. An analysis done to determine the nexus and rough proportionality is provided below. The findings also address the LCP requirements that the type and extent of access be specified as part of a permit approval and that access be provided concurrent with the proposed development, even in the case of lost access caused by the development occurring in the future. The findings result in **Special Condition 3**, which requires PG&E to submit within six months a plan to provide access along several miles of shoreline on the Diablo Canyon lands outside of the high security area.

The findings below provide some background on access issues, then an analysis of the nexus and "rough proportionality" between the ISFSI and its effect on access, and finally, a determination of the type and extent of access to be provided as part of coastal development permit approval.

Background: In its initial review of the coastal development permit for this project, County staff provided an assessment that determined a nexus existed between the loss of public access and operation of the power plant, and that access would be required at the end of the power plant's operating license in 2025. County staff also compared potential visitation to the Diablo Canyon lands with actual visitation to the coastal lands immediately to the north – Montana de Oro State Park – and to the south – Port San Luis Harbor District. It calculated that the access lost in the intervening 20 years or so represented about 470,000 visitors per year and that each visit was worth about $6.00, for a total economic value lost of about $56 million. Because the loss was due to both the power plant and the ISFSI, County staff partitioned responsibility for the lost access between the two facilities so that 20 to 25% was due to the ISFSI, which resulted in a recommended in-lieu access fee of about $12.6 million to pay for offsite access improvements until approximately 2025. After that time, the County determined that access to the Diablo Canyon lands include the following:

- A shoreline lateral easement from the mean high tide line to the toe of the coastal bluff along the approximately twelve miles of coast between the property's southern boundary and its northern boundary;
- A fifty-foot wide lateral easement along the existing service road from the southern entrance of the Diablo Canyon lands to their northern boundary at Montana de Oro State Park; and,
- Vertical access between these two lateral easement at every mile.

County staff further recommended that these easements be developed through "Offers To Dedicate" that would remain valid but not be accepted until after the power plant's operational licenses lapsed and the project site decommissioned, and that in no case these offers lapse before the year 2030.

The County's analysis was valuable in that it used a credible approach to determine rough proportionality. However, instead of establishing a nexus between the ISFSI and lost access, it based its nexus on the future decommissioning of the power plant. Additionally, the analysis did not result in conformity to the LCP requirement that access be provided concurrent with the proposed development.

Coastal Commission analysis of nexus and rough proportionality: The public access findings and special condition herein are based in part on a modified evaluation of the analysis done by the County. This analysis, however, recognizes that the loss of access will be caused by the ISFSI rather than by the power plant. This analysis also recognizes that there are opportunities to meet LCP Section 23.04.420(5) requirements to provide immediate and specific public access. It is only within the 760-acre high security zone that federal law prohibits access; therefore, some part of the rest of the Diablo Canyon lands owned and controlled by PG&E are available to

fulfill public access requirements[5]. As noted above, part of that area is already being used to meet the access requirements of a previously-issued CDP. These findings also recognize that the ISFSI construction would occur immediately but the loss of access due to the ISFSI would occur after the power plant is decommissioned – either after 2014, if the replacement steam generators are not approved, or after the expiration of the current operating license in 2025.

Nexus – Effects of the Proposed Project on Public Access: The proposed project would extend into perpetuity the existing and, but for the ISFSI, temporary loss of coastal access caused by the power plant. When the power plant is decommissioned, currently anticipated to be sometime after 2014 or 2025, the ISFSI will cause lost access currently caused by the presence of the power plant. Even though the ISFSI's physical development covers only about nine acres, the effect of the ISFSI's security needs results in the entire 1.5 miles of shoreline within the 760-acre high security zone being unavailable for access. Therefore, but for the ISFSI, this shoreline area would be available for public access after the power plant is decommissioned. Additionally, as noted above, PG&E has prevented access to much of the public tideland along the rest of the twelve miles of shoreline along the Diablo Canyon lands.

There is currently no certainty that a permanent storage facility will be available to replace the ISFSI at the end of its 20- to 40-year license or that there would be adequate storage for its stored spent fuel if such a facility were built. Without this certainty, the Commission must presume the ISFSI will be in place for the foreseeable future. Conversely, there are known limits to the useful life of the power plant – it must cease operations either by 2014, if the PUC does not approve the rate increase needed to pay for the replacement steam generators, or by 2025 when the current license to operate expires. The power plant could operate for a longer period if PG&E applies for and receives an extension to its current operating license; however, PG&E has not yet applied for an extension and such an extension would, at a minimum, require installation of the new steam generators, which is still not a certainty. After either of these currently anticipated shutdown dates and the subsequent power plant decommissioning, the ISFSI becomes the facility solely responsible for long-term loss of public access to the 1.5 miles of shoreline within the security zone.

Proportionality: Judicial decisions interpreting state and federal constitutions require that permit conditions for shoreline access or in-lieu fees for access be roughly proportional to the loss of public access caused by the project. The analysis to determine proportionality does not have to be exact, but the determination should be based on credible and relevant information.

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[5] We note that PG&E in its appeal of the County's CDP argues that a future NRC "Order to Decommission the Plant" may include requirements that preempt or conflict with access. That potential eventuality has no bearing on this current analysis. If a future federal requirement results in such a conflict, PG&E may request the Coastal Commission amend this coastal development permit. Further, as cited in the project's EIR, federal law (42 U.S.C. Section 10152) directs federal agencies to take the actions necessary to encourage and expedite the effective use of necessary additional storage of spent fuel. This citation suggests that the NRC would recognize and support the need for the proposed project to meet Coastal Act public access requirements as long as the access does not conflict with federal security requirements.

The rough proportionality analysis below includes two main steps; first, it evaluates the current value of future coastal public access visits to be lost annually due to the ongoing presence of the ISFSI; it then adjusts that level of lost access based on the delay in the ISFSI not causing the losses until after the power plant is decommissioned. This adjustment incorporates the likely future growth in visitation along the coast, and recognizes a reasonable cap, or "carrying capacity", for visitation. As an additional step, the analysis provides an economic evaluation of the approximate dollar amount of each lost visitor day and applies that cost to the losses associated with the ISFSI. These results are then used to develop the requirements of **Special Condition 3**.

1) Determining current value of annual lost visitor days: There are recent data for annual visitation to the two areas immediately north and south of the Diablo Canyon lands, Montana de Oro State Park and Port San Luis Harbor. These data provide a reasonable starting point for determining likely visitation to the Diablo Canyon area. This starting point is then adjusted to reflect several aspects of the proposed project, the requirements of the LCP and the Coastal Act, and the environmental setting. These analyses, including several reasonably conservative adjustments, are described below.

   Recent annual visitation to the two areas north and south totals somewhat over 1.5 million visitors – in 2002, Montana de Oro State Park to the north had 767,352 visitors and Port San Luis Harbor to the south had about 800,000 visitors. At both areas, the coastal setting is the main amenity available to visitors. The coastal lands of Diablo Canyon can be considered at least equally attractive to visitors as the two adjoining areas above, as they represent a relatively unspoiled section of the California coastline with broad coastal terraces and sweeping views along the coast. Therefore, some proportion of these 1.5 million visitors each year would likely visit the Diablo Canyon lands coastline if access were available. Even if access was limited to foot traffic due to security concerns, there would likely be significant visitation, although not as much as if vehicle traffic were allowed. This strong interest in hiking access is evidenced by the popularity of the Pecho Coast Trail – even with the restrictions on access associated with those hikes, PG&E reports that most of the twice-a-week hikes are fully booked during most of the year. It is conservatively reasonable to assume, then, that of the over 1.5 million yearly visitors to the adjacent coastal areas, at least a quarter to a third of them, or roughly 400,000, would visit the Diablo Canyon lands if they could. To provide additional conservatism, this analysis assumes that that most of these visitors to the Diablo Canyon lands are likely to be part of the existing "pool" of people already visiting either of these two adjacent areas rather than entirely new visitors.

   This number should be further adjusted to reflect the difference in size between the shoreline area in the security zone where the ISFSI would cause lost access and the accessible shoreline areas of the State Park and Harbor. The State Park offers about five miles of shoreline and the Harbor offers about a mile of accessible shoreline, so the mile-and-a-half of shoreline within the ISFSI security zone represents 25% of the approximately six miles of shoreline in both the State Park and the Harbor. This would therefore reduce the 400,000 annual visits noted above to 100,000. This is a conservative comparison, since visitation in both the State Park and Harbor is concentrated in areas smaller than their entire shoreline;

however, this conservatism provides additional credibility for this analysis. 100,000 visitors per year equates to an average of about 275 per day, which is a reasonable figure to expect along a one-and-a-half mile stretch of the California coast.

2) Adjustments for delay in lost access, future growth in visitation, and "carrying capacity": As noted previously, the information currently available requires a presumption that the ISFSI and its associated security zone would exist at the site in perpetuity. The time period when the ISFSI, rather than the power plant, will cause the lost access would start when the power plant is decommissioned. This is currently expected to be at some point after either 2014 or 2025. Even without knowing the exact date of decommissioning, it is possible to calculate a reasonable range of dates in which decommissioning would occur based on previous or ongoing decommissionings at other facilities. Further, because it is presumed that the ISFSI will be at the site in perpetuity, an initial difference in the starting date of a decade or two does not make a significant overall difference in its long-term effect on visitation. Finally, in recognition of the "carrying capacity" of the other site and taking into account the sensitivity of coastal resources, placing a cap on the levels of visitation required to make up for the ISFSI's losses further reduces the differences that would occur from using any of several starting dates within a range of several decades.

- Adjusting for the delay in lost access: The NRC regulations governing nuclear power plants decommissioning allow up to sixty years for power plant operators to complete the necessary decommissioning process. To date, four commercial power plants have been decommissioned and nineteen are currently undergoing the process. The range of times between plant shutdown and the known or anticipated completion of decommissioning for these facilities ranges from about three years to thirty-nine years.

  Based on the existing NRC requirements, the most conservative assumption for decommissioning the Diablo Canyon power plant would be sixty years after the end of its current operating license, which would be 2085. However, because costs to the power plant operators continue to accrue during the decommissioning process, and because it has been feasible for other power plants to complete decommissioning in as little as a few years after the end of operations, a more reasonable conservative assumption for Diablo Canyon would be somewhere in the mid-range of the three-to-thirty-nine year range noted above, or about twenty years after the power plant ends operations. Based on an end-of-operations date of either 2014 (assuming no steam generator replacement) or 2025 (assuming power plant operations until the end of the current operating license), decommissioning could reasonably be presumed to be completed sometime between 2034 and 2045, or roughly 2040.

- Adjustment for future growth and discounting to present value: As noted previously, because the ISFSI must be presumed to remain in place in perpetuity, there is little difference in the long-term effect on visitation caused by selecting a starting date that varies by a decade or two. The following calculation, however, is provided to ensure that the Commission's findings are reasonable. Using a starting date of 2040 requires adjusting the current value of 100,000 lost visitor days to reflect both the long-term

growth rate of visitation along the coast and the lag time of the ISFSI's effect on visitation. Data from San Luis Obispo County show that an average rate of growth in coastal population of about 12%. For purposes of this analysis, that rate is discounted severely to provide a very conservative future rate of long-term growth of 2%. Applying this rate of growth to a starting point of 100,000 visits in 2005 results in future annual visitation rates of about 134,000 in 2020, 164,000 in 2030, 200,000 in 2040, and so on[6]. Based on the conservatively reasonable assumption above that the power plant would be decommissioned by 2040, the lost visitation starting in 2040 due to the ISFSI would be 200,000 visits per year. While double the initial number of lost visits, it is still lower than the current level of visitation at the adjacent State Park and Harbor.

- Carrying capacity: Recognizing that the other coastal resources in the area would likely be adversely affected by a continually increasing number of visitors, it is additionally conservative to consider a reasonable carrying capacity for visitation so that public access to the Diablo Canyon lands is assumed to be at a level consistent with protection and preservation of other coastal resources. A requirement to provide coastal visitation reflecting the 2 percent long-term growth rate would result in the level of visitation each year climbing from 200,000 in 2040 to almost 300,000 twenty years later and nearly 450,000 forty years later. Leaving the growth rate out of the analysis does not accurately reflect the realities of increasing demand for visitation along the coast, but applying the growth rate without considering limiting factors could easily lead to adverse impacts to other important coastal resources. Many of these impacts can be avoided or limited using a managed access approach – for example, by limiting access to foot traffic and largely to blufftop and coastal terrace trails, more visitors can be accommodated with fewer impacts than if vehicle traffic were allowed or if access was provided to sensitive beach or rocky shoreline habitat.

  A reasonably conservative approach would be to recognize that there are limits to the numbers of visitors the Diablo Canyon lands are able to handle without adverse effects on its other coastal resources. Determining the capacity of Diablo Canyon lands to handle visitors while concurrently supporting other coastal resources would allow reasonable access to those lands, allow the use of in-lieu fees or development of nearby off-site visitor amenities in support of this access, and ensure conformity to the applicable public access policies to maximize feasible public access. Establishing a minimum level of at least 100,000 visits per year results in an average of just less than 300 visits per day, which is a level for which a managed access program can readily avoid adverse impacts to the other coastal resources of concern.

3) Cost per visitor day: Several methodologies are available to determine the economic value of coastal public access opportunities. The County's analysis in its CDP review for this project used several examples of lost coastal access values at other California coastal locations to determine a base rate of $13.00 per visitor per day for lost access at Diablo Canyon. The

[6] The formula is the same as is used to determine compound interest: $FV = IV(1+p)^n$, where FV = Future Value, IV = Initial Value, p = percent growth, and n = the number of years. For the first example above, assuming the ISFSI is constructed in 2005 and the power plant is decommissioned in 2020 (15 years): $100{,}000\ (1 + 0.02)^{15} = 134{,}587$.

County reduced this base figure using a system developed at Texas A&M University that assigned numerical ratings to the different types of experiences provided to coastal visitors, such as the number of different types of recreational experiences are available, accessibility to the site, how many similar types of areas are available, and others. By applying that rating system to the Diablo Canyon coast, the County concluded that it would be reasonably conservative to value each lost visit to the Diablo Canyon coast at $6.00 per day.

More recently, in October 2004, the Commission conditionally granted CDP 03-02-24 (Ocean Harbor House Seawall) on the basis of staff analysis that each visit to the beach in Monterey had a value of $13.00. Staff analysis referenced several studies that used various techniques to quantify the economic value of beaches, to evaluate attributes that enhance or detract from the economic value of visits to the coast, to assign value to coastal visits based on travel costs, and others. Based on a value of $13.00 per visitor per day, the Commission found that the loss of an acre of Monterey beach due to increased erosion caused by a new seawall and occurring over 50 years had a value of $5.3 million. The analyses used recently by the County and the Commission to reach those conclusions provide a starting point for the findings below, although they have been modified to reflect differences between the economic value of a visit to the shoreline in Monterey and at Diablo Canyon.

The $13.00 per visit value assigned to a visit at the Monterey beaches is likely higher than the value of a foregone visit to the ISFSI shoreline area. The wider, sandy beaches that characterize the Monterey area have more amenities nearby, such as parking, shopping, and overnight accommodations, that appeal to a wider range of the public. The Diablo Canyon shoreline is rockier and the beaches are generally smaller or seasonal, and it has fewer of these amenities nearby. Additionally, the access that would be provided through **Special Condition 3** is primarily to the coastal bluffs with only limited or indirect access to the beaches. However, these differences may be balanced to some degree by the appeal of the Diablo Canyon area due to its relatively unspoiled and therefore desirable shoreline. This lack of amenities is what makes the Diablo Canyon lands more desirable for access to a smaller but significant portion of the public. Still, the economic value of a Diablo Canyon shoreline visit is likely less than a Monterey shoreline visit. If its comparative value is conservatively estimated at only half of a Monterey visit, each Diablo Canyon visit would be valued at about $6.00, which is the same estimate derived from the County's assessment.

Based on this analysis, the current annual economic value of annual lost coastal access along the ISFSI shoreline is approximately $600,000 ($6.00 per visitor day multiplied by 100,000 visits). Assuming a 3% annual increase in inflation but conservatively assuming no growth in visitation, the economic cost of that lost access would total just over $16 million during the first 20 years and about $45 million by the fortieth year. These costs are about 12 percent and 19 percent respectively of PG&E's estimates of the overall ISFSI costs of about $132 million during the first twenty years and about $235 million over forty years. While these figures represent relatively high proportions of the overall project costs, the actual cost of implementing the necessary level of visitation is likely to be much lower, as it is reasonable to assume that PG&E's costs to provide managed and relatively low-impact visitation (i.e.,

during daylight hours only, allowing foot traffic only) on its own lands will be less than the types of visitor facilities upon which these figures are based.

4.4.1.5 Summary of Public Access Findings and Requirements

The public access requirements necessary for approval of this development are based on the following:

- Both the LCP and the Coastal Act require maximum feasible public access.
- Both the LCP and Coastal Act generally require that access be provided as part of projects such as this one, located between the first public road and the sea. Exceptions provided to that requirement do not apply to this development.
- While public access is not available along the shoreline closest to the immediate project area due to federal security concerns, it is feasible to provide it along PG&E's adjacent shoreline property immediately north and south of the ISFSI.
- There is a clear nexus between the development and the loss of coastal access. Because the ISFSI must be presumed to exist on the site in perpetuity, its associated prohibitions on access due to security concerns are also presumed to exist in perpetuity and will result in a permanent loss of access to 1.5 miles of California coastline.
- Based on a reasonably conservative "rough proportionality" analysis, the current number of visits lost due to access prevented by the ISFSI is about 275 visits per day or 100,000 visits per year. The current economic value of those lost visits is approximately $600,000 per year, and the future economic value of those lost visits is conservatively estimated to increase at 3% per year.

Special Condition 3 requires that access to the shoreline be provided on PG&E's Diablo Canyon lands to the north and south of the ISFSI high security area, and that the level of access provided be at least roughly commensurate to the current value of lost visitation, as noted above. PG&E is to submit an access plan for Executive Director review and approval within six months of Commission approval of this coastal development permit.

The minimum requirements of the access plan include several specific access provisions, but also include consideration of several other provisions as needed to provide the necessary level of access. Access is to be provided largely along existing accessways on the Diablo Canyon lands that are currently unavailable for public access or that have very limited public access. The plan is to include the following:

- Provide lateral access to at least three miles of existing roads and trails on coastal blufftops between Montana de Oro State Park and Crowbar Creek, and at least three overlooks to the beaches along that stretch of the coast. This area is relatively flat and open, and can provide exceptional hiking opportunities along the blufftops. Additionally, this type and level of access can be managed to allow the necessary level of security and public safety and to prevent undue adverse impacts to other coastal resources.
- Provide vertical access to at least one beach in that same area, along with lateral access to the beach. Many of the beaches in this part of the Diablo Canyon lands are recognized for their

habitat value; however, access to at least one beach along the northernmost section of the property near Point Buchon is feasible and is not expected to cause substantial adverse effects. This beach is adjacent to the State Park and could provide enhanced public access in coordination with the State Park.

- Provide increased access to the Pecho Coast Trail. PG&E currently provides two docent-led hikes per week of up to 20 hikers each, which allows a maximum of 2080 hikers per year. The approved management plan for that trail recognizes that PG&E could provide hikes daily rather than twice per week. This could increase access to up to about 7300 visitors per year while operating under the same security and resource protection provisions that are currently in place. The condition recognizes the rugged characteristics of the shoreline from the southern end of the trail to the Rattlesnake Canyon area and does not require additional accessways in the trail area; however, as part of its submitted plan, PG&E may request the existing Pecho Coast Trail management plan or MOU be amended to allow additional access or additional accessways, if necessary.
- Provide pedestrian access to these areas during daylight hours.
- Provide permanent legal protection to these accessways through deed restrictions. **Special Condition 3** requires PG&E to submit those deed restrictions within thirty days of Executive Director approval of the Access Plan. It also requires that the accessways meet the minimum requirements of the LCP related to width, signage, and other components.
- Describe the specific improvements that will be placed to provide the anticipated level of access, such as necessary improvements to roads or trails, benches, parking, garbage collection, and others. Some of these types of improvements are already present on the Pecho Coast Trail. **Special Condition 3** also requires these improvements be maintained for the life of the project.
- Include monitoring and reporting provisions to evaluate the success of the plan in providing the anticipated level of access.
- Implement the plan's provisions within two years of Executive Director approval.

Along with the required components of the plan, PG&E may include other measures if necessary to support or increase the level of access provided by those required components. These optional provisions may include:

- Providing additional vertical and lateral beach access on the northern portion of the Diablo Canyon lands if it can be provided without causing significant adverse effects on other coastal resources, or if access can be provided to those beaches subject to closure during critical or sensitive times, for instance during seal pupping season.
- Providing improvements to adjacent or nearby properties in support of access to the Diablo Canyon lands. There are a number of potential opportunities that could result in enhanced access to not only the Diablo Canyon lands but to other nearby areas offering shoreline access. Examples include improvements to the Point San Luis lighthouse, coordination with Montana de Oro State Park for trail extensions, enhanced personnel, or visitor services, and working with the Harbor District to implement aspects of its coastal access plan.
- Identifying appropriate non-profit entities or public recreational agencies that could provide management of the accessways and provisions of the Access Plan.

4.4.1.6 Conclusion

With the imposition of Special Condition 3, the Commission finds the project will conform to the public access and recreation policies of the Coastal Act and the certified Local Coastal Program.

4.4.2 Geologic Hazards

4.4.2.1 Applicable LCP Provisions

LCP Section 23.04.118 states:

> *New development or expansion of existing uses proposed to be located adjacent to a beach or coastal bluff shall be located in accordance with the setbacks provided by this section instead of those provided by Sections 23.04.110 or 23.04.112. The required setback shall be the larger of the two required by subsections (1) and (2) of this section.*
>
> *(1) Stringline Setback Method. Where fifty percent of the lots adjacent to the coastline within three hundred feet of the site are developed at the time of application, no part of a proposed new structure, including decks, shall be located closer to the seaward property line of the site than the greatest distance determined by either of the following:*
> *(A) A line between the most seaward portions of the structures on the adjacent lots; or*
> *(B) Where there is substantial variation of land from between adjacent lots, the average setback of structures on the adjoining lots shall be used.*
>
> *(2) Bluff Retreat Setback Method. New development or expansion of existing uses on blufftops shall be designed and set back from the bluff edge a distance sufficient to assure stability and structural integrity and to withstand bluff erosion and wave action for a period of seventy-five years without construction of shoreline protection structures that would in the opinion of the planning director require substantial alterations to the natural landforms along bluffs and cliffs. A site stability evaluation report shall be prepared and submitted by a certified engineering geologist based upon an on-site evaluation that indicates that the bluff setback is adequate to allow for bluff erosion over the seventy-five-year period. The report shall accompany the land use permit application, and shall contain the following information:*
>
> *(A) Historic, current and foreseeable cliff erosion, including investigation of recorded land surveys and tax assessment records in addition to the use of historic maps and photographs, where available, and possible changes in shore configuration and sand transport;*
> *(B) Cliff geometry and site topography, extending the surveying work beyond the site as needed to depict unusual geomorphic conditions that might affect the site and the proposed development;*
> *(C) Geologic conditions, including soil, sediment and rock types and characteristics in addition to structural features such as bedding, joints, and faults;*

(D) Evidence of past or potential landslide conditions, the implications of such conditions for the proposed development, and the potential effects of the development on landslide activity;
(E) Wave and tidal action, including effects of marine erosion on sea cliffs;
(F) Ground and surface water conditions and variations, including hydrologic changes caused by the development (e.g., introduction of sewage effluent and irrigation water to the groundwater system; alterations in surface drainage);
(G) Potential effects of seismic forces resulting from a maximum credible earthquake;
(H) Effects of the proposed development including siting and design of structures, septic system, landscaping, drainage, and grading, and impacts of construction activity on the stability of the site and adjacent area;
(I) Potential erodibility of the site and mitigation measures proposed to minimize erosion problems during and after construction. Such measures may include but are not limited to landscaping and drainage design;
(J) The area of demonstration of stability shall include the base, face, and top of all bluffs and cliffs. The extent of the bluff top considered should include the area between the face of the bluff and a line described on the bluff top by the intersection of a plane inclined a 20-1/4 degree angle from the horizontal passing through the toe of the bluff or cliff, or fifty feet inland from the edge of the cliff or bluff, whichever is greater;
(K) *Any other factors that may affect slope stability.*

LCP Section 23.07.984 states:

All land use permit applications for projects located within a geologic study area (except those exempted by Section 23.07.082) shall be accompanied by a report prepared by a certified engineering geologist and/or registered civil engineer (as to soils engineering), as appropriate. The report shall identify, describe and illustrate, where applicable, potential hazard of surface fault rupture, seismic shaking, liquefaction or landslide, as provided by this section. Provided, however, that no report is required for an application located in an area for which the county engineer determines that sufficient information exists because of previous geology or soils reports. Where required, a geology report shall include:

(1) A review of the local and regional seismic and other geological conditions that may significantly affect the proposed use;

(2) An assessment of conditions on or near the site that would contribute to the potential for the damage of a proposed use from a seismic or other geological event, or the potential for a new use to create adverse effects upon existing uses because of identified geologic hazards. The conditions assessed are to include, where applicable, rainfall, soils, slopes, water table, bedrock geology, and any other substrate conditions that may affect seismic response, landslide risk or liquefaction potential;

(3) Conclusions and recommendations regarding the potential for, where applicable:
(A) Surface rupture or other secondary ground effects of seismic activity at the site,
(B) Active landsliding or slope failure,
(C) Adverse groundwater conditions,
(D) Liquefaction hazards;

(4) Recommended building techniques, site preparation measures, or setbacks necessary to reduce risks to life and property from seismic damage, landslide, groundwater and liquefaction to insignificant levels.

LCP Section 23.07.086 states:

All uses within a geologic study area are to be established and maintained in accordance with the following, as applicable:

(1) Grading. Any grading not otherwise exempted from the permit requirements of Sections 23.05.020 et seq. is to be performed as engineered grading under the provisions of those sections.

(2) Seismic Hazard Areas. As required by California Public Resources Code Section 2621, et seq. and California Administrative Code Title 14, Sections 3600, et seq. no structure intended for human occupancy shall be located within fifty feet of an active fault trace within an earthquake fault zone.

(3) Erosion and Geologic Stability. New development shall insure structural stability while not creating or contributing to erosion, sedimentation or geologic instability.

Section 23.04.118 is most applicable to the cask transport road and soil disposal area 3, portions of which are adjacent to the eroding coastal bluff at the site. Suitability of the proposed setbacks will be discussed in Section 4.4.2.4 of this report (Coastal Erosion and Bluff Retreat). Sections 23.07.084 and 23.07.086 apply to the entire project. The required geologic report is contained within the *Safety Analysis Report* (SAR) prepared by the applicant as a requirement of licensing by the Nuclear Regulatory Commission. In addition, the applicant has prepared several other reports at the request of Coastal Commission staff to evaluate the hazards at the site. All of these geologic reports are evaluated in Sections 4.4.2.3 and 4.4.2.4 of this report (Seismic Hazards, and Coastal Erosion and Bluff Retreat, respectively). With regard to section 23.07.086, staff notes that the site does not lie within an Alquist-Priolo Earthquake Fault Zone, nor are there known active fault traces within 50 feet of any structure for human habitation. The area has not been mapped by the California Geological Survey to assess liquefaction and earthquake-induced landslide susceptibility under the Seismic Hazard Mapping Act. Nonetheless, documents supplied by the applicants address these hazards.

It should be noted that the Commission is statutorily proscribed from applying these LCP policies – or any section of the California Coastal Act – to issues related to nuclear or radiation safety. Nevertheless, proposed development must assure geologic stability in order to conform to the Local Coastal Plan and the Coastal Act. The analysis that follows relates to the safety of the proposed development from geologic hazard; it does not address the consequences of structural failure in terms of nuclear safety. Such consequences are under the jurisdiction of the Nuclear Regulatory Commission (NRC), and are the subject of additional public hearings.

4.4.2.2 Geologic and Tectonic Setting of Project Site and Area

The Diablo Canyon Power Plant (DCPP) and the proposed project are in the Coast Ranges physiographic province of coastal California. This area straddles the boundary between the Pacific and North America plates. Movement between these plates is partitioned among several strike-slip faults (see Exhibit 5), including the San Andreas Fault (45 miles from the project site), the Rinconada-East Huasna Fault (20 miles from the project site), the Oceanic-West Huasna Fault (14 miles from the project site), the Los Osos Fault Zone (8 miles from the project site), and the San Simeon-Hosgri Fault Zone (3 miles from the project site). All of these faults have been mapped as "active" (showing movement in the last 10,000 years) by the California Geological Survey. Although most interplate movement is strike-slip, a component of compression also exists between the North America and Pacific Plates. It is this compression that is responsible for the uplift of the Coast Ranges. Faulting and folding in the area has been complex, and the manner of partitioning of movement among the many known and postulated faults in the area is a subject of great debate. The geometry of structures and the type of movement occurring on any particular fault has potential to affect the seismic hazard associated with a fault.

The area is described in more detail in the SAR, which is also the source of Exhibits 6, 7, and 8 in these findings. Both the power plant and the ISFSI are located on a sub-block of the San Luis Range (one range in the Coast Ranges physiographic province) known as the Irish Hills sub-block (see Exhibit 6, SAR Figure 2.6-4). The site is underlain by dolomitic sandstone, siltstone and claystone of the Obispo Formation. This unit contains numerous thin clay seams, and is intruded by volcanic rocks. (see Exhibit 7, SAR Figure 2.6-6). The sedimentary rocks were deposited in a marine setting 22-14 million years ago (see Exhibit 8, SAR Figure 2.6-13). Subsequent to (or, perhaps contemporaneous with) deposition of these units, they underwent dolomitization—the pervasive alteration of limestone beds to dolomite—and small amounts of oil migrated into these units from elsewhere. Between about 18 and 12 million years ago, the Obispo Formation was intruded by volcanic rocks, which produced local deformation and hydrothermal alteration of the rocks. A major period of deformation extended from 12 million years ago until at least 2 million years ago; some models have deformation continuing to the present. During this deformation, the area was cut by several major strike slip faults and the rocks were folded, and uplifted above sea level. In the project area, the Obispo Formation is folded into a broad syncline—a U-shaped fold—known as the Pismo Syncline. Subsequent to the major period of deformation, continued uplift and erosion has exposed all of these rocks in the project area (see Exhibit 9). Erosion has resulted in a steep hillslope, the site of the proposed ISFSI, on the limb of the Pismo Syncline. Bedding dips in the direction of the slope, creating a

potential slope stability hazard. Indeed, a massive landslide deposit lies to the north of the ISFSI site, along Skyview Road (see Exhibit 7).

Like most of coastal California, the area continues to be deformed by movement along faults. Several models have been postulated for the tectonic setting of the area. These models can perhaps best be understood in the context of a discussion of the Hosgri fault, the closest active fault to the site, and probably an important active tectonic boundary. The fault lies just offshore of the project site, in water depth of approximately 100 meters.

The Hosgri Fault and Deep Crustal Structure at the Site: What would later become known as the Hosgri fault zone was first identified by Shell oil company geologists, Hoskins and Griffith, working from geophysical data. The original proprietary data were first made public in 1971 (Hoskins and Griffith, 1971). This was the during review period for the operating license application for the Diablo Canyon power plant. In response to NRC requests for information, PG&E and U.S. Geological Survey (USGS) scientists working under contract with NRC investigated this fault zone, resulting in an evolving picture of the regional tectonic framework.

Early models for the fault assumed that it was vertical and primarily a right-lateral strike-slip fault. This interpretation was challenged in the early 1980's by Crouch and others (Crouch et al., 1984), who interpreted seismic reflection data to show that the fault was near vertical at the surface, but dipped to the east and flattened at depth. Drawing on analogies from the Southern California borderland, these authors interpreted the fault to be primarily a thrust fault, thrusting rocks above the fault over rocks beneath the fault (see Exhibit 9). This compressional structure may have represented reactivation of earlier faults that were extensional in nature (Crouch and Suppe, 1993). Many still consider the fault to be primarily or largely thrust in nature; indeed the Southern California Earthquake Center (SCEC) identifies the fault as "primarily reverse and thrust, with some right-lateral slip" (see http://www.data.scec.org/fault_index/hosgri.html)

The Hosgri fault has been correlated with the onshore San Simeon fault to the north, which is demonstrably primarily a strike slip fault. This fact, and refined seismic reflection data collected primarily by PG&E, lead PG&E geologists to conclude that the Hosgri fault is primarily a right-lateral strike slip fault, like the San Andreas Fault to the west. Further, they conclude that the fault is major tectonic boundary that, together with Oceanic-West Huasna and Santa Ynez River fault zones, defines a triangular shaped block they call the Los Osos domain (McLaren and Savage, 2001) (see Exhibit 10). Clockwise rotation of this domain results in movement along a number of interior faults (The Cambria fault, The Los Osos fault, The Oceano-Wilmar Avenue faults, Casmalia fault, and Lion's Head fault, and compression is accommodated by relatively high-angle thrusting along a number of these faults (particularly the Oceanic Fault Zone). In addition to PG&E, many consider the Hosgri fault to be principally strike-slip in nature, including the California Geological Survey (see http://www.consrv.ca.gov/CGS/rghm/psha/ofr9608/b_faults1.htm).

A contrasting tectonic model for the area has been put forth by Namson and Davis (Namson and Davis, 1990). These workers have constructed a number of balanced (retrodeformable) structural cross sections through the southern Coast Ranges and the Santa Maria Valley, including two cross sections through the Los Osos/Santa Maria Valley. The retrodeformable cross-section technique, which models folding and faulting as intimately linked, was first developed in fold and thrust belts such as the Appalachians. By assuming the conservation of mass in the line of the cross section, the structure of folds and faults can be modeled at depth. The cross sections are "retrodeformable" in the sense that folding and faulting can be quantitatively reversed; thus the exercise of preparing such cross sections places constraints on possible geometries at depth (Suppe, 1983). Namson and Davis' model (see Exhibit 11) shows a basal detachment at 11-14 km depth, from which step several large thrust faults, which terminate as folds at the surface, consistent with the concept of a "fault bend fold" as put forth by Suppe (Suppe, 1983). Most significant for the seismic potential at the power plant and project site is that a thrust fault (Point San Luis Thrust) is required directly below the site at depths of 7 to 11 km. This fault would be a seismic source considerably closer to the site than the Hosgri Fault. In addition, movement on this fault would be thrust in nature, which could direct seismic energy upward toward the plant, a directivity that is unlikely on a strike-slip fault offset from the plant. In the Namson and Davis model, the Hosgri fault must be currently inactive. They postulate that it is an inactive normal fault bounding the eastern margin of the Santa Maria Basin.

All of these models for the Hosgri fault (and others) have been explored in some depth by scientists working for USGS, PG&E, and their consultants. These investigations have been summarized in PG&E's response to questions from the NRC during the review of their Long Term Seismic Program (LTSP). In addition, at the request of Coastal Commission staff, the USGS speeded up the planned publication of these studies so that they would be available for Commission review on this appeal. The result is USGS Bulletin 1995-BB; a summary of the style and rate of deformation on the Hosgri Fault (Hanson et al., 2004). This study concludes, from a broad spectrum of geological, seismological, geophysical, and tectonic data that:

> "The Hosgri Fault Zone is primarily a strike-slip fault with a subordinate component of dip slip in the contemporary tectonic setting. The dip-slip component varies both in cumulative amount and sense (east versus west side up) along strike. We base this conclusion on the following observations and lines of geologic reasoning:
>
> - There is a regional tectonic association and alignment of the Hosgri Fault Zone with the well-documented strike-slip San Gregorio/San Simeon Fault system. The Hosgri Fault Zone aligns with and is nearly identical in structural style and fault zone complexity to these faults. Tectonic and kinematic analyses require that lateral slip continues southward onto the Hosgri Fault Zone. There are no other candidate structures or tectonic explanations that can account for an abrupt termination of lateral slip at the southern end of the San Simeon Fault Zone. The pattern and style of deformation within the Los Osos domain and the rate and orientation of geodetically determined rates of crustal shortening also require that horizontal slip occur along the Hosgri Fault Zone. Interpretations that the Hosgri Fault Zone is predominantly a reverse or oblique-slip fault

have severe slip-rate-budget discrepancies and are not consistent with the tectonic setting of south-central coastal California.

- The northern Hosgri Fault Zone is related to the southern San Simeon Fault Zone via the San Simeon/Hosgri pull-apart basin. The presence of a subsiding basin between two large fault zones, one of which (the San Simeon Fault Zone) is a well-documented strike-slip fault, provides strong tectonic and kinematic evidence that the other bounding fault (the Hosgri Fault Zone) is also a strike-slip fault.

- Quantification of components of horizontal and vertical slip along the entire length of the Hosgri Fault Zone indicates ratios of horizontal to vertical slip of 2:1 to 30:1. The quantified rates of vertical slip incorporate the total amount of vertical deformation across the entire fault, including the upper crustal fold deformation related to the low-angle fault strands within the fault zone, as well as brittle fault deformation and folding associated with the high-angle fault strands. Based on the rake angles implied by these horizontal to vertical ratios, together with an estimate of fault dip, the Hosgri Fault Zone is classified as a strike-slip fault along most, if not all, of its length. The uncertainties allow for the possibility that the fault may have oblique slip in the southernmost reaches.

- The Hosgri Fault Zone is comparable in style of deformation to other recognized strike-slip faults based on a review of published criteria to identify and characterize strike-slip faults as they are imaged on seismic reflection data worldwide. Diagnostic characteristics include:

  (1) Reversals in the sense of vertical separation both down dip and along strike of the fault indicate lateral offset has juxtaposed stratigraphic units at different structural levels.
  (2) The presence of local intra-fault-zone pull-apart basins at right-releasing stepovers in the fault trace near Point Sal and Point San Luis indicate right-slip displacement.
  (3) Positive and negative flower structures with associated intra-fault-zone anticlinal and synclinal folding are common along the zone. These features are diagnostic of strike-slip faults.
  (4) The fault zone and individual fault strands within the zone are linear at regional scale (greater than 20 km) and curvilinear to linear at local scale (less than 20 km). Fault-trace sinuosity is lower than 1.1 and is similar to that along other known strike-slip faults (such as the San Andreas and North Anatolian Fault Zones) and independently indicates a high-angle fault dip. Fault-trace sinuosity is not similar to known reverse or thrust faults (such as the Pleito and San Fernando Faults), where fault-trace sinuosity typically is greater than 1.2."

Seismicity: An additional line of evidence for the tectonic structure of the DCCP area is the distribution and nature of earthquakes recorded at the site. USGS maintains a limited array of seismographs in the area. These are supplemented by a more extensive network maintained by PG&E. In response to staff requests, PG&E provided their high-resolution data showing the distribution and nature of microearthquakes along the Hosgri Fault recorded between October

1987 and January 1997 (see Exhibits 12 & 13). Several important points can be drawn from these data. First, there is in fact a great deal of seismicity associated with the fault, indicating that the fault is indeed an active fault. Second, the focal mechanisms of the majority of the earthquakes recorded along the fault indicate right-lateral strike-slip or oblique-slip (right lateral strike slip with a reverse component) movement. Finally, seismicity extends to a depth of approximately 13 km, well below the fault ramp underlying the inactive Hosgri fault of the Namson and Davis model. Accordingly, these data support the conclusions of USGS, PG&E, and their consultants that the Hosgri Fault is a major active fault, primarily right-lateral strike slip, but with a component of reverse (thrust) movement.

In addition to the microseismicity associated with the Hosgri fault, several large earthquakes that have occurred in the vicinity shed light on the seismic potential of the area:

Lompoc Earthquake: The magnitude 7.0 Lompoc earthquake of 1927 is one of the largest earthquakes to occur in coastal California in the Twentieth Century. According to the Southern California Earthquake Center:

> "The earthquake of November 4, 1927 was one of the most powerful shocks in southern California this century. Fortunately, it occurred in a reasonably sparsely populated area, and some distance offshore, so damage was lighter than would be expected for a quake of such magnitude. In the area nearest the epicenter (the coastal area near the town of Surf), people were thrown from standing and reclining positions, a concrete highway was cracked, a railroad bridge was thrown out of line, and sand and water were fountained from the ground, leaving behind up to twenty "sand craters".
>
> This earthquake also produced a sea-quake (compressional shock transmitted by water) and a seismic sea wave. The sea-quake was so violent it killed and stunned fish near Point Arguello and shook at least two ships in the area: the S.S. Socony and the Alaska Standard. Neither was seriously damaged, however.
>
> The seismic sea wave (tsunami) produced by the shock was approximately 2 meters high at Surf and Pismo Beach and was recorded from La Jolla (near San Diego) to Fort Point (near San Francisco). The first wave was recorded as positive (not preceded by recession of water) at all the California coastal stations that noted it.
>
> No deaths or major injuries (excepting those of ocean fish) were reported in connection with this earthquake."

The epicenter was relatively poorly located at the time due to the paucity of seismographs in this relatively remote area. After the discovery of the Hosgri Fault, it has been widely felt that the Hosgri Fault may have been the source of this earthquake (Gawthrop, 1978), and the early seismic design of the power plant was based largely on a possible repetition of this earthquake. The earthquake had a clear reverse fault, or thrust, mechanism (Helmberger et al., 1992), leading credence to models of the Hosgri fault as a reverse or thrust fault.

More recently, however, workers using additional teleseismic (from distant seismographs) data (Helmberger et al., 1992) and modeling based on tsunami records (Satake and Somerville, 1992) have shown fairly conclusively that the earthquake was located further offshore, perhaps on the Santa Lucia Bank Fault. Accordingly, this earthquake is not a good model for a potential earthquake on the Hosgri Fault.

San Simeon Earthquake: The *M* 6.5 San Simeon Earthquake of 22 December 2003 was the largest historic earthquake to occur within 50 miles of the Diablo Canyon site, and the only large historic earthquake in the area other than the Lompoc Earthquake. The Commission's staff geologist presented a report on this earthquake at the January 2004 hearing. This report was based largely on preliminary data released by the USGS and the California Integrated Seismic Network (CISN). USGS scientists, in conjunction with scientists from the California Geological Survey and academia, later issued a formal (although still "preliminary") report on the earthquake (Hardebeck et al., 2004). This report places the epicenter at a depth of 7.1 km, indicates that the focal mechanism was that of a thrust fault, and indicates that the earthquake likely occurred on a blind thrust fault (one that does not reach the surface) similar to those that produced the 1994 Northridge, 1983 Coalinga, and 1985 Kettleman Hills earthquakes. The report notes that extrapolation of the fault plane to the surface would coincide with the surface trace of the Oceanic Fault, but indicated that the earthquake likely did not occur on the fault because the Oceanic Fault "is though to be a vertical strike-slip fault." However, as noted in the report of the Commission's staff geologist "The Oceanic fault…is a poorly understood fault separating the Santa Lucia mountains from the San Simeon-Cambria structural block…which lacks the geomorphic features typical of large strike-slip faults."

Jay Namson has placed the earthquake in the context of his fault-propagation fold model by projecting it into the line of the cross section running through the project site (Namson and Davis, 2004). At a depth of 7.1 km, the earthquake would be located on a thrust ramp underlying Santa Lucia Range. This is analogous to the postulated Point San Luis Thrust underlying the site in the Namson and Davis model. Accordingly, the San Simeon Earthquake could be an analog for a earthquake that could occur directly under the Diablo Canyon power plant according to the Namson and Davis model.

PG&E has prepared several reports to the NRC evaluating the San Simeon Earthquake. The latest version, dated June 7, 2004, presents their evaluation of how this earthquake fits into the regional tectonic framework (PG&E Letter DCL-04-071). PG&E processed data from their seismograph array, which is somewhat better positioned to accurately locate the epicenter than the USGS operated seismographs (see Exhibit 14). A principal difference between the results from USGS (Hardebeck et al., 2004) and PG&E is that PG&E places the depth of the earthquake at 10.9 km. This is consistent with teleseismic body-wave data, which yield a 12 km depth. In addition, preliminary tests using the combined USGS/PG&E dataset indicate a depth of 10.6 km. Given that the McLaren and Savage model for the tectonic setting of the Los Osos Domain (see Exhibit 10) indicates that the Oceanic Fault has a large reverse fault component, this depth and the reverse focal mechanism is consistent with the McLaren and Savage model. On the other hand, a depth of 11-12 km would be well below the Santa Lucia thrust predicted by the Namson and Davis model.

Conclusions Regarding Regional Tectonic Environment at the Project Site: As is apparent from the proceeding discussion, the regional tectonic environment in the vicinity of the project site is complex. Several competing models for the tectonic environment have been proposed, and these models have differing implications to the seismic hazard potential at the site. The preponderance of the evidence supports the McLaren and Savage model, which is the model used by PG&E in developing the ground motion predictions for the ISFSI.

The principal evidence in support of this model are as follows:

1) Microseismicity along the Hosgri Fault indicates that it is tectonically active, consistent with the McLaren and Savage model, but not consistent with the Namson and Davis model.

2) Microseismicity along the Hosgri Fault is primarily right-lateral strike slip and oblique slip, consistent with the McLaren and Savage model, but not consistent with the normal fault mechanism of the Namson and Davis model.

3) Microseismicity along the Hosgri fault extends to depths of approximately 13 km, consistent with the steep, active strike slip fault of the McLaren and Savage model. The Namson and Davis model requires that the fault be inactive at depths greater than about 7 km, the depth of the Point San Luis thrust in that model.

4) The Namson and Davis model was created by the construction of retrodeformable cross sections. There are several assumptions inherent in this technique that appear to not be met in the project area, including:

   a) <u>There is no loss of material out of the plane of the cross section</u>. In a strike slip environment, this assumption clearly is not valid.
   b) <u>Deformation occurs at low temperatures (i.e., shallow depth)</u>. This requirement places constraints on the depth of fault-propagation folding. The depths required by active seismicity on the Hosgri fault would place the fault-bend folding at too great a depth for deformation to occur under brittle conditions.
   c) <u>Bedding thickness is preserved during deformation; rocks behave as brittle, bedded sedimentary strata</u>. The highly sheared, relatively soft rocks found in the area—the Franciscan formation in particular—are unlikely to preserve bedding thickness during deformation. The granitic basement in part of the area will not behave as bedded strata.

5) The model of McLaren and Savage provides a coherent explanation for geologic observations on a regional scale. The model of Namson and Davis draws largely on two balanced cross sections. There are several instances where known geologic conditions are not accurately explained by the Namson and Davis model. In particular, the faults bounding the sub-blocks of the Los Osos domain (such as the active Los Osos Fault) are not part of the model. Further inconsistencies are documented in PG&E Letter DCL-04-071.

6) If the PG&E determination of the depth of the San Simeon Earthquake is correct; the focal mechanism and location of that earthquake are consistent with the McClaren and Savage model, but are not consistent with the model of Namson and Davis (2004) for the San Simeon event.

4.4.2.3 Seismic Hazards

Seismic hazards at the site include ground shaking, surface rupture, liquefaction, slope instability, and tsunami runup. All of these issues are addressed in these findings, but ground shaking deserves special attention as it is the seismic hazard most likely to affect the proposed development. To fully discuss the ground shaking hazard, an understanding of the means geologists use to quantify ground shaking is necessary.

Ground shaking: Many different measures have been used over the years to assess earthquake magnitude. The familiar Richter or local magnitude (M_L) is based on the ground shaking observed on a particular type of seismograph, and is most sensitive to short period (<0.8 second) seismic waves. These waves die out with distance, and so this measure is inappropriate when applied over long distances (> ~300 miles) to measure distant earthquakes. Moreover, for large earthquakes, the Richter magnitude "saturates", and fails to accurately reflect differences between large earthquakes of different magnitudes. The surface wave magnitude (M_S) was developed to measure shaking of long period (~20 second) waves, and is more suited to larger earthquakes. This scale, like its counterpart the body wave magnitude (M_B) also saturates in large earthquakes and, like the Richter magnitude, is based solely on ground shaking, not the amount of energy released by an earthquake. Currently, most seismologists prefer the moment magnitude (M_W) for measuring large earthquakes. This measure is based on the strength of the rocks, the area of fault rupture, and the amount of slip during an earthquake, and is a better measure of the amount of energy released by an earthquake.

An earthquake of a given magnitude will produce different levels of ground shaking at different locations, depending on the distance of the location from the earthquake hypocenter, the nature of the soil or rock between the location and the earthquake, and soil and rock conditions at the site. The level of shaking is expressed by a term called "intensity", and is quantified by the Modified Mercalli Index, whereby intensities ranging from I (not felt) through XII (near total destruction) are assigned based on the level of damage sustained by human structures. Better quantification of the level of shaking also is possible; and the standard measure is peak ground acceleration (PGA), usually expressed as a fraction of the acceleration due to gravity (9.81 m/s^2, or 1.0 g). Other measures, such as peak ground velocity, also may be used but these are more rarely tabulated. Peak ground acceleration is typically measured in horizontal and vertical directions. It can be expressed deterministically ("a given earthquake can be expected to produce a peak horizontal ground accelerations at the site of *X* g"), or probabilistically ("given the seismic environment at the site, there is a 10% chance that a peak ground acceleration of *X* g will be exceeded in 50 years"). The current trend is to express seismic risk in probabilistic terms. The State of California has defined ground accelerations with a 10% chance of exceedance in 50 years as corresponding to the "maximum probable earthquake" for the site. Ground shaking with a 10% chance of exceedance in 100 years is defined as the "maximum

credible earthquake". Peak ground accelerations depend not only on the intensity of the causative earthquake and the distance of the site from the hypocenter of the earthquake, but also on site characteristics. Most important is the depth and firmness of the soil and/or bedrock underlying the site. All of these parameters are evaluated in producing a seismic shaking hazard assessment of a site.

In evaluating the response of structures to ground shaking, the frequency (cycles per second) of that shaking is important—higher frequency shaking is more damaging to smaller, more rigid structures, whereas lower frequency shaking is more damaging to larger, or more flexible structures. The proposed ISFSI facility fits into the latter category.

Different ground acceleration values apply to seismic waves with different frequencies or periods. Thus, an earthquake with a peak ground acceleration of 0.7 g may have a peak "spectral acceleration" (SA) of 1.1 g for waves of 0.3 second period, but only 0.5 g for waves with periods of 1 second. A typical earthquake produces seismic waves with many different periods, and a plot of spectral accelerations for an earthquake shows the ground accelerations for waves of all periods.

The ISFSI Seismic Design Criteria: The seismic shaking hazard map of California (Peterson et al., 1999) portrays the region as having a moderate seismic shaking potential, with a 10% chance of exceeding approximately 0.4 g in 50 years. The U.S. Geologic Survey's latitude-longitude earthquake ground motion hazard look-up page (http://eqint.cr.usgs.gov/eq/html/lookup-2002-interp.html) similarly reports an expected peak ground acceleration of 0.30 g (10% chance of exceedance in 50 years). The probabilistic peak ground accelerations and spectral accelerations for the Diablo Canyon area, assuming firm bedrock conditions, are as follows (determined from the USGS lookup page):

	10% in 50 yr	**2%in 50 yr**
PGA	0.30 g	0.70 g
0.2 sec SA	0.68	1.63
1.0 sec SA	0.26	0.63

This assessment, however, is based only on current understanding of the likelihood of earthquakes of varying intensities on nearby faults, so understanding the tectonic environment at the site is critical. These values assume that the Hosgri Fault is the closest fault capable of producing an earthquake and that the Hosgri Fault is dominantly strike slip with an oblique to reverse component. Commission staff concurs with this assessment. Because the Hosgri fault is so close to the site, it dominates the probabilistic evaluation of seismic risk; by designing for a large earthquake on the Hosgri Fault, the ISFSI also would be safe from the largest possible earthquake on any other known active fault.

Originally, two design basis earthquakes were considered to establish the seismic design criteria of the Diablo Canyon power plant. These were a magnitude 7.25 earthquake on the Nacimiento Fault (20 miles from the site) and a magnitude 6.75 aftershock associated with a large earthquake on the San Andreas Fault, and centered on the power plant site. With the 1972 discovery of the active Hosgri Fault, a new design basis earthquake was needed. USGS and others argued that the *M* 7.0 Lompoc earthquake had been associated with the Hosgri Fault, and recommended that the Hosgri be considered capable of a *M* 7.5 earthquake, for conservatism. The ground motions that would be produced at the site by such an earthquake were calculated, given appropriate attenuation models and site characteristics, as a Peak Ground Acceleration (PGA) of 0.75 g. PG&E then reanalyzed and upgraded the power plant components to be able to accommodate this ground motion. This ground motion has been referred to as the "Hosgri" ground motion. The 1978 approval of the seismic design of the plant included the recommendation that the seismic design be reevaluated in ten years taking into account any new information that became available. Part of the full operating license approval for Unit 2 required PG&E to update the geological, seismological, and ground-motion information, reevaluate the magnitude of the earthquake used to determine the Diablo Canyon seismic design basis, reevaluate ground motion expected at the site, reassess engineering and equipment response, and perform a seismic probabilistic risk assessment and deterministic studies as necessary. This lead to the creation of the Long Term Seismic Program (LTSP). The purpose of the LTSP was seismic margins analysis; to make sure that the plant had sufficient margin of safety (or could be upgraded) given new geologic information. As part of the LTSP, the Lompoc earthquake was reevaluated, and determined not to be associated with the Hosgri Fault (Hanks, 1979). Further, the Hosgri fault was re-evaluated and assigned a maximum possible magnitude of 7.2. The ground motion at the power plant site associated with such an earthquake is known as the "LTSP ground motion". Exhibits 15 and 16 show the ground motion spectra for the Hosgri and LTSP ground motions (together with the earlier approved Double Design Earthquake ground motion) for the horizontal and vertical components, respectively.

The probabilistic hazard assessment in the LTSP assigned a probability of 65% that the earthquake on the Hosgri fault would be strike-slip, 30% oblique slip, and 5% reverse slip (thrust). The NRC contracted with USGS and scientists at the University of Nevada, both of whom felt that this assessment underestimated the reverse (thrust) fault component of the Hosgri Fault (Slemons and Clark, 1991; United States Geological Survey staff, 1991). Accordingly, the NRC recommended that the fault be considered 2/3 strike-slip and 1/3 reverse (Nuclear Regulatory Commission, 1991).

PG&E modeled the ground motion resulting from the two models for movement on the Hosgri, and found that the ground motion associated with the NRC recommendation differed from the LTSP ground motion primarily at long wave periods (over 2 seconds). PG&E further showed that the plant components have sufficient margin to accommodate the NRC recommended ground motion, and the NRC concurred (Nuclear Regulatory Commission, 1991). Accordingly, the NRC found that the power plant design would withstand the maximum credible earthquake on the Hosgri fault. The Coastal Commission staff geologist concurs with this assessment.

Unlike the power plant, the ISFSI will consist of structures that will respond the long-period seismic waves. Accordingly, PG&E developed a new seismic design spectra with increased spectral accelerations at long periods. This ground motion, known as the ISFSI Long Period (ILP) spectra. In addition, new information has become available since the certification of the LTSP that shows that effects such as rupture directivity and tectonic deformation (fling) may be import at sites near the source of an earthquake. Accordingly, PG&E has incorporated the influence of fault rupture directivity and fling in the ILP spectra. Details of the assumptions inherent in the development of the ILP spectra are provided in the Diablo Canyon ISFSI FSAR Update dated June 2004. Exhibits 17 and 18 show the horizontal and vertical components of the ILP ground motion, respectively.

The Coastal Commission staff geologist concurs with PG&E and the NRC that these are appropriate ground motions to use in the design of the ISFSI pads and casks, and for use in slope stability analyses of the cut slopes and hillsides above the ISFSI and cask transporter route. Based on these analyses and reviews showing that the ISFSI structures are designed to resist this ground motion, the Commission finds that the proposed project will be constructed to assure stability during ground shaking, as required by the LCP.

Surface Rupture: No active faults were found at the project site despite concerted efforts during geologic studies related to both the power plant and the ISFSI. According to the SAR, Numerous faults were encountered, with displacements ranging from a few inches to a few feet. At least five faults show vertical separation of several tens of feet. PG&E believes that these faults were formed either 1) during the Miocene deformation described above; 2) in relation to the growth of the Pismo Syncline, or 3) in relation to the intrusion of the diabase in the Obispo Formation. In any case, several lines of evidence indicate that they are not active and do not represent a faulting hazard at the site. First, the two marine terraces cut into the site, whose age has been established as 80,000 and 105,000 years, are not deformed by these faults, thus indicating that there has been no movement on those faults since at least 105,000 years ago. Second, these faults are similar and probably related to those encountered during the excavations for the power plant's power block, which were shown not to displace Late Pleistocene marine terrace deposits in the power plant FSAR update. Finally, aerial photo interpretation of pre-1971 photographs (before the borrow excavation at the ISFSI site) showed no geomorphic features associated with displacement along the faults. Further, none of the tectonic models for the site include active faults that could rupture the surface at the location of the proposed ISFSI. Accordingly, the Commission finds that that the proposed project will be constructed to assure stability with regard to fault rupture hazard, as required by the LCP.

Liquefaction: The ISFSI site occupies an excavation into the Obispo Formation used to obtain fill for the construction of the nearby switchyard. Construction of the ISFSI will require further excavation. Accordingly, the ISFSI will be constructed on dense bedrock generally considered not subject to liquefaction during intense ground shaking. Further, no near surface-ground water was encountered in borings collected during the geologic investigations for the SAR.

As reported in the SAR:

> "…groundwater beneath the ISFSI site is controlled by the elevation of water in Diablo Creek that is at about elevation 100 ft MSL opposite the ISFSI. This is at least 190 feet below the ISFSI pads, which are at elevation 310 MSL."

Thus, there is no possibility of liquefaction at the ISFSI site.

Similarly, most of the transport road lies at relatively high elevations and lies on cuts into the Obispo Formation. Exceptions are those areas that are to be built on fill, some of which are at locations where perched groundwater could occur. Although fills could be susceptible to liquefaction, proper compaction during their construction will minimize this risk.

Accordingly, the Commission finds that the proposed project will be constructed to assure stability with regard to liquefaction hazard, as requited by the LCP.

Slope Stability: The ISFSI site lies on a moderately steep hillside with bedding that dips in the direction of slope (see Exhibit 19). Further, the Obispo Formation at this location contains a number of thin clay beds that have much lower strength than the Obispo dolomite, siltstone, and sandstone. Accordingly, a slope stability hazard exists naturally at the site; indeed the north side of the hill into which the ISFSI is cut contains a large, apparently inactive, landslide complex. The slope stability hazard could be exacerbated by the proposed project, which contemplates cutting steeper slopes into this already potentially unstable hillside, both for the ISFSI itself and for the Transport Road.

Further, there is an active landslide in Patton Cove, and where the transport road approaches the coast it passes within approximately 200 feet of this landslide. Road cracks and broken water lines have occurred within 140 feet of the proposed transport route. An appropriate setback for the transport route from the landslide and the eroding coastal bluff will be addressed in Section 4.4.2.4 (Coastal Erosion and Bluff Retreat). This section will address the stability of the hillslope above the ISFSI, and cut slopes at the ISFSI and along the transport route.

Stability of the Hillslope above the ISFSI: The cross section in Exhibit 19 represents the critical geometry for slope stability calculations; that is, this is the most likely cross section to fail. Sliding along the clay beds could result in a global failure of the slope; with the inactive fault traces imparting vertical lines of weakness that should be considered in the slope stability analysis. The SAR analyzed global failure of this cut slope using three models (see Exhibits 20, 21, and 22), involving sliding along shallow, intermediate, and deep clay beds.

Rock strength parameters for the clay beds were collected from consolidated-undrained triaxial compression tests, drained and undrained direct-shear tests, and undrained cyclic direct shear tests. Rock strength parameters for the dolomite and sandstone units were determined by two methods, the Barton-Choubey and Hoek-Brown methods, which use actual measurements, and an empirically based approach, respectively, for evaluating the role of discontinuities such as faults, bedding planes and joints, in determining intact rock strength.

The static slope stability analysis using the three models (ten slide surfaces) yielded factors of safety between 1.62 and 2.86. From these results, the SAR concludes that the hillslope is stable under static conditions, and the Commission staff geologist concurs.

The cutslope above the ISFSI was next examined for seismic stability by calculating the seismically induced displacements predicted by the Newmark method using the ILP design spectra described previously in these findings at Section 4.4.2.3 (Ground Shaking). Three slide surfaces (one from each model, above) were analyzed, at 26 locations along each slide surface. A sensitivity analysis was used to determine the most sensitive time histories given the line of cross section in Exhibit 19 and the Hosgri fault source parameters. Two different ground motions were calculated, and the three slide models evaluated for maximum displacements. The range of displacements calculated ranged from 0.6 feet to 3.1 feet. Displacements of this size are substantial, far in excess of what would normally be allowed for foundation elements, for example (about 2 inches). Accordingly mitigation measures are planned, and described in the SAR, including the use of rock bolts and tie backs. Given these mitigation measures, the SAR concludes, and the Commission staff geologist concurs, that none of the displacements indicated by any of the models would affect the ISFSI pads.

ISFSI Cut Slopes: New grading for the ISFSI will include cutslopes along the southwestern, southeastern, and northeastern margins of the site. These were analyzed in the SAR for stability using kinematic, pseudostatic, and dynamic analysis based on the ILP ground motion.

The kinematic analysis involves calculating geometries for planar sliding, wedge sliding, and block toppling that would cause slope failure, on the basis of measured rock strength parameters. These “failure envelopes” are then evaluated relative to mapped discontinuities such as bedding planes, joints, and fault surfaces. This analysis indicates that there is a moderate to high potential for both planar sliding and wedge sliding in the northeastern cutslope; a high potential for wedge failure and low to moderate hazard of planar sliding in the southwestern (back) cut slope; and a high hazard of toppling in the southwest cut slope. The SAR concludes, given the planned mitigation measures (rock bolts and tie backs; as well as siting the ISFSI pads out of range of topple hazards), that none of these failure modes pose a threat to the ISFSI. The Commission staff geologist concurs with this assessment.

Pseudostatic probabilistic slope stability analyses were performed on the potential wedge failures identified by the kinematic analysis. Several potential blocks show factors of safety of less than 1.0 under seismic loading conditions when fully saturated. The probabilities of failure range as high as 100% under these conditions. Deterministic analyses were performed to calculate the supporting forces necessary to retain these slopes (achieve a factor of safety of 1.3) under seismic conditions. These resisting forces are the design specifications for the planned mitigation measures—tie backs and rock bolts. Given these additional resisting forces, the slopes should be secure from the calculated wedge failures.

Cut slopes along Transport Route: Kinematic analysis were performed for the SAR of the north-trending and northwest-trending cutslopes along the transport route. There is a moderate topple hazard along the north-trending cutslopes, but low to very low hazard of sliding and wedge failures along the north-trending cutslope, and for all failure modes for the northwest-trending cutslopes. Dynamic analysis (Newmark method) of the natural hillslope above the transport route indicates that displacements of about 1 foot or less are possible during the ILP ground motions. Although such displacements would be large for foundation elements, they are unlikely to affect the transport route.

Accordingly, the Commission finds that the hillslopes at the site are shown to be stable under worst-case seismic loading conditions. Some of the cutslopes, however, may be susceptible to wedge, planar sliding, and/or topple failures during such an event. This potential instability can be mitigated for by the installation of rock bolts and tiebacks, design parameters for which are provided in the SAR. Because rock bolts and tiebacks can be subject to corrosion and deterioration, the Commission finds that this potential slope instability can be mitigated only if the mitigation measures are routinely monitored and maintained. Accordingly, the Commission finds that **Special Condition 4**, which requires those installed features be monitored and maintained, is necessary to ensure compliance with the LCP. **Special Condition 4** further requires PG&E to submit a coastal development permit application or request for amendment to this permit if corrective measures are considered necessary.

Tsunamis: Local or distant earthquakes or submarine landslides have the capacity to generate a tsunami that could affect the site. Indeed, the Lompoc Earthquake produced a tsunami that was widely recognized throughout southern California, and as far away as Hawaii. The SAR contained a statement that "due to the elevation of the ISFSI, a maximum tsunami would not cause any flooding to the ISFSI". The NRC's Request for Additional Information contained a request for additional information on this subject. In response, PG&E stated in Letter DIL-02-009:

> "The data and analysis used to support the statement that a maximum tsunami would not cause any flooding at the SFSI site are from the DCPP FSAR Update. The maximum combined wave runup from a distantly generated tsunami is 30 ft (9.1 meters) (DCPP FSAR Update, Section 2.4.6.1.3), and the maximum combined eave runup for near shore tsunamis is 34.6 ft (10.5 meters) relative to a mean lower low water (MLLW) reference datum (DCPP FSAR Update, Section 2.4.6.1.4). This I significantly lower than the elevation of the Diablo Canyon ISFSI site at 310 ft (~94.5 meters) above sea level (MSL) (312.6 ft, 95.3 meters above MLLW) or the Transporter route at 80 ft (~24.4 meters) above MSL."

The letter goes on to address new information about the occurrence and generation of tsunamis in California and the world, although no new information pertains directly to central California. This analysis included review of coastal inundation mapping by the State of California along the coast of southern California, San Francisco, and Monterey Bay, an analysis of subaerial landslides that could cause tsunamis, and an analysis of the potential for large submarine landslides.

From this analysis, the letter concluded:

> "Based on analysis of tsunami runups from the world-wide data, estimates of potential runups for southern California and the San Francisco Bay area, and our preliminary assessment of tectonic and landslide generated tsunamis for the central California coast at Diablo Canyon, it is judged that a runup from an earthquake on the Hosgri fault, runup from a distantly generated tsunami, and from an offshore landslide induced by an earthquake would be less than or equal to the DCPP design-basis tsunami and significantly below the elevation of the Diablo Canyon ISFSI sit at 310 ft (~94.5 meters) above MSL and the transporter route at a minimum elevation of 80 ft (~24.4 meters)."

The Commission staff geologist concurs with this assessment. Accordingly, the Commission finds that the proposed project will be constructed to assure stability with regard to tsunami hazard, as requited by the LCP.

4.4.2.4 Coastal Erosion and Bluff Retreat

LCP Section 23.04.118 states that, for purposes of new development, "The required setback shall be the larger of the two required by subsections (1) and (2) of this section." Subsection (1) describes the stringline method of establishing setbacks. As noted above, this method is not applicable to the proposed project. Subsection (2) states, in relevant part, that new development

> *…shall be designed and set back from the bluff edge a distance sufficient to assure stability and structural integrity and to withstand bluff erosion and wave action for a period of seventy-five years without construction of shoreline protection structures that would in the opinion of the planning director require substantial alterations to the natural landforms along bluffs and cliffs. A site stability evaluation report shall be prepared and submitted by a certified engineering geologist based upon an on-site evaluation that indicates that the bluff setback is adequate to allow for bluff erosion over the seventy-five-year period.*

The closest point that the proposed project encroaches on the coastal bluff at the site is in the area of Patton Cove, where the proposed transport route approaches within approximately 200 feet of the bluff edge. The ISFSI and Cask Transfer Facilities, in contrast, lie more than 1500 feet from the bluff edge (see Exhibit 23).

At Patton Cove, the bluff is actively receding both by gradual bluff retreat and by active landsliding. The applicants have prepared two reports to address these issues and to determine appropriate setbacks per Section 23.94.118. The first, dated 8 June 2004, is a shoreline retreat study for Diablo and Patton Coves. The study makes use of historic records and field observations of shoreline retreat at the site, review of topographic maps dated from 1941 to 1998, interpretation of aerial photographs dating from 1939 to 2000, review of two LIDAR surveys, performed in 1997 and 1998, correlation of rock strength data and erosion rates (based

on correlations noted in the San Diego County area by Benumof and Griggs (Benumof and Griggs, 1999), and observation of the retreat of the seacliff around anchor bolts installed in Diablo Cove. The results are summarized in Exhibit 24. The report concludes that:

> "…the only method with a reasonable level of confidence to estimate the long-term shoreline retreat rates in Diablo and Patton Cove is the estimated site-specific retreat from the Discharge Structure anchor bolt erosion, and estimates from the comparison of terrestrial pre- and post-construction photographs of the Diablo Cove seacliff toe."

These "terrestrial observations" suggest an average retreat rate for the period 1969 to 2004 of 0.03 to 0.2 feet per year. The length of record is somewhat shorter than the Commission generally is comfortable with for determining long-term bluff retreat rates, but apparently these are the best data available from this relatively remote area.

Since no anchor bolts were installed in Patton Cove, nor are historic pre- and post-construction photographs available, the report recommends that a long-term bluff retreat rate for Patton Cove be obtained by extrapolating the rate from Diablo Cove. Staff concurs that this is appropriate. In consideration of the depth to width aspect ratios between Diablo and Patton Cove, the report indicates that the long-term erosion rates in Patton cove should be ¼ to ½ the rates obtained from the Diablo Cove data. The report accordingly reduces the Diablo Cove rates by a factor of 2 to 4. Commission staff feels that this reduction is not well supported by the data, and informed the applicant that a more conservative approach would be to assume that the maximum measured Diablo Cove rates also applied to Patton Cove. Accordingly, the applicant applied the Diablo Cove rates when establishing setback requirements for the project.

These setback recommendations are included in a report dated October 8, 2004, "Setback Requirements for the Diablo Ocean Drive Patton Cove Landslide". This report contains a detailed analysis of the Patton Cove landslide complex (see Exhibits 25 and 26). This work involved geologic mapping, as well as monitoring of inclinometer data (see Exhibit 27), which allows accurate placement of the active slide planes. Based on these data, and previously published data concerning rock strength, quantitative slope stability analyses were performed along three cross-sections. From these data, the location of the static 1.5 factor of safety line and the pseudostatic 1.1 factor of safety line were determined (see Exhibit 25). The pseudostatic 1.1 factor of safety line lies landward of the static 1.5 factor of safety line, and represents the setback necessary to assure safety from the landslide at the present time. To this is added the expected erosion over the next 75 years, based on the upper end data from Diablo Cove (0.20 feet per year). The resulting setbacks range from 100 to 205 feet and are presented on Exhibit 25.

There is, however, a great deal of uncertainty associated both with the data on which the long-term bluff retreat rate is based and on the future behavior of the Patton Cove landslide. Accordingly, the Commission finds that **Special Condition 5** must be applied, requiring continued monitoring and annual reporting on the Patton Cove landslide area. The condition further requires that if monitoring indicates the development will be threatened in less than 75 years, PG&E submit within sixty days of each year's annual report an application for an

amendment to this coastal development permit to relocate the transfer route as needed. Only with this special condition does the Commission find that the setback shown in Exhibit 27 is sufficient to assure that the proposed development will be safe from coastal erosion for the next 75 years, as required by section 23.04.118 of the LCP.

4.4.2.5 Conclusions Regarding Geologic Hazards

Based on the above analyses and evaluations, and with imposition of the special conditions, the Commission finds that the project will conform to the geologic hazard provisions of the certified LCP.

4.4.3 Environmentally Sensitive Habitat Areas

This section first evaluates sensitive habitat concerns related to the locations of the various ISFSI components, and then discusses habitat issues related to the requirements of **Special Condition 3** for shoreline public access to the Diablo Canyon lands.

4.4.3.1 Applicable LCP Provisions

Section 23.07.160 states:

> *The sensitive resource area combining designation is applied by the official maps (Part III) of the land use element to identify areas with special environmental qualities, or areas containing unique or endangered vegetation or habitat resources. The purpose of these combining designation standards is to require that proposed uses be designed with consideration of the identified sensitive resources, and the need for their protection, and, where applicable, to satisfy the requirements of the California Coastal Act. The requirements of this title for sensitive resource areas are organized into the following:*
> *23.07.162 Applicability of standards;*
> *23.07.164 SRA permit and processing requirements;*
> *23.07.166 Minimum site design and development standards;*
> *23.07.170 Environmentally sensitive habitats;*
> *23.07.172 Wetlands;*
> *23.07.174 Streams and riparian vegetation;*
> *23.07.176 Terrestrial habitat protection;*
> *23.07.178 Marine habitats.*

Section 23.07.162 states:

> *The standards of Sections 23.07.160 through 23.07.166 apply to all uses requiring a land use permit that are located within a sensitive resource area combining designation.*

Section 23.07.164 states:

> *The land use permit requirements established by Chapters 23.03 and 23.08, are modified for the SRA combining designation as follows:*
> *(1) Initial Submittal. The type of land use permit application to be submitted is to be as required by Chapter 23.03 (permit requirements), Chapter 23.08 (special uses), or by planning area standards. That application will be used as the basis for an environmental determination as set forth in subsection (3) of this section, and depending on the result of the environmental determination, the applicant may be required to amend the application to a development plan application as a condition of further processing of the request (see subsection (4) of this section).*
> *(2) Application Content. Land use permit applications for projects within a sensitive resource area shall include a description of measures proposed to protect the resource identified by the land use element (Part II) area plan.*
> *(3) Environmental Determination.*
> *(A) When a land use permit application has been accepted for processing as set forth in Section 23.02.022, it shall be transmitted to the environmental coordinator for completion of an environmental determination pursuant to the California Environmental Quality Act (CEQA).*
> *(B) The initial study of the environmental determination is to evaluate the potential effect of the proposed project upon the particular features of the site or vicinity that are identified by the land use element as the reason for the sensitive resource designation.*
> *(C) Following transmittal of an application to the environmental coordinator, the planning department shall not further process the application until it is:*
> *(i) Returned with a statement by the environmental coordinator that the project is exempt from the provisions of CEQA; or*
> *(ii) Returned to the planning department accompanied by a duly issued and effective negative declaration which finds that the proposed project will create no significant effect upon the identified sensitive resource; or*
> *(iii) Returned to the planning department accompanied by a final environmental impact report approved by the environmental coordinator.*
> *(4) Final Permit Requirement and Processing.*
> *(A) If an environmental determination results in the issuance of a proposed negative declaration, the land use permit requirement shall remain as established for the initial submittal;*
> *(B) If an environmental impact report is required, the project shall be processed and authorized only through development plan approval.*
> *(5)Required Findings. Any land use permit application within a sensitive resource area shall be approved only where the review authority can make the following required findings:*
> *(A) The development will not create significant adverse effects on the natural features of the site or vicinity that were the basis for the sensitive resource area designation, and will preserve and protect such features through the site design;*

(B) Natural features and topography have been considered in the design and siting of all proposed physical improvements;
(C) Any proposed clearing of topsoil, trees, or other features is the minimum necessary to achieve safe and convenient access and siting of proposed structures, and will not create significant adverse effects on the identified sensitive resource;
(D) *The soil and subsoil conditions are suitable for any proposed excavation; site preparation and drainage improvements have been designed to prevent soil erosion, and sedimentation of streams through undue surface runoff.*

Section 23.07.166 states:

All uses within a sensitive resource area shall conform to the following standards:
(1) Surfacing mining is not permitted except in areas also included in an energy and extractive resource area combining designation by the land use element. Where the dual designation exists, surface mining is allowed only after approval of surface mining permit and reclamation plan, approved in accordance with Section 23.08.180.
(2) Shoreline areas shall not be altered by grading, paving, or other development of impervious surfaces for a distance of one hundred feet from the mean high tide line, seventy-five feet from any lakeshore, or fifty feet from any streambank, except where authorized through development plan approval. Where the requirements of the California Department of Fish and Game or other public agency having jurisdiction are different, the more restrictive regulations shall apply. Special requirements for setbacks from wetlands, streams, and the coastline are established by Sections 23.07.172 through 23.07.178.
(3) Construction and landscaping activities shall be conducted to not degrade lakes, ponds, wetlands, or perennial watercourses within an SRA through filling, sedimentation, erosion, increased turbidity, or other contamination.
(4) Where an SRA is applied because of prominent geological features visible from off-site (such as rock outcrops), those features are to be protected and remain undisturbed by grading or development activities.
(5) Where an SRA is applied because of specified species of trees, plants or other vegetation, such species shall not be disturbed by construction activities or subsequent operation of the use, except where authorized by development plan approval.

Section 23.07.170 states:

The provisions of this section apply to development proposed within or adjacent to (within one hundred feet of the boundary of) an environmentally sensitive habitat as defined by Chapter 23.11 of this title, and as mapped by the land use element combining designation maps.
(1) Application Content. A land use permit application for a project on a site located within or adjacent to an environmentally sensitive habitat shall also include a report by a

biologist approved by the environmental coordinator that:

(A) Evaluates the impact the development may have on the habitat, and whether the development will be consistent with the biological continuance of the habitat. The report shall identify the maximum feasible mitigation measures to protect the resource and a program for monitoring and evaluating the effectiveness of the mitigation measures;

(B) Recommends conditions of approval for the restoration of damaged habitats, where feasible;

(C) Evaluates development proposed adjacent to environmentally sensitive habitats to identify significant negative impacts from noise, sediment and other potential disturbances that may become evident during project review;

(D) Verifies that applicable setbacks from the habitat area required by Sections 23.07.170 to 23.07.178 are adequate to protect the habitat or recommends greater, more appropriate setbacks.

(2) Required Findings. Approval of a land use permit for a project within or adjacent to an environmentally sensitive habitat shall not occur unless the applicable review body first finds that:

(A) There will be no significant negative impact on the identified sensitive habitat and the proposed use will be consistent with the biological continuance of the habitat;

(B) The proposed use will not significantly disrupt the habitat.

(3) Land Divisions. No division of a parcel containing an environmentally sensitive habitat shall be permitted unless all proposed building sites are located entirely outside of the applicable minimum setback required by Sections 23.07.172 through 23.07.178. Such building sites shall be designated on the recorded subdivision map.

(4) Development Standards for Environmentally Sensitive Habitats.

(A) New development within or adjacent to the habitat shall not significantly disrupt the resource.

(B) New development within the habitat shall be limited to those uses that are dependent upon the resource.

(C) Where feasible, damaged habitats shall be restored as condition of development approval.

(D) Development shall be consistent with the biological continuance of the habitat.

(E) *Grading adjacent to environmentally sensitive habitats shall conform the provisions of Section 23.05.034 (3).*

Section 23.07.174 states:

Coastal streams and adjacent riparian areas are environmentally sensitive habitats. The provisions of this section are intended to preserve and protect the natural hydrological system and ecological functions of coastal streams.

(1) Development Adjacent to a Coastal Stream. Development adjacent to a coastal stream shall be sited and designed to protect the habitat and shall be compatible with the continuance of such habitat.

(2) Limitation on Streambed Alteration. Channelization, dams or other substantial alteration of stream channels are limited to:

(A) Water supply projects; provided, that quantity and quality of water from streams shall be maintained at levels necessary to sustain functional capacity of streams, wetlands, estuaries and lakes;

(B) Flood control projects, where such protection is necessary for public safety or to protect existing commercial or residential structures, when no feasible alternative to streambed alteration is available;

(C) Construction of improvements to fish and wild life habitat;

(D) Maintenance of existing flood control channels. Streambed alterations shall not be conducted unless all applicable provisions of this title are met and if applicable, permit approval from the California Department of Fish and Game, the U.S. Army Corps of Engineers, and California State Water Resources Control Board.

(3) Stream Diversion Structures. Structures that divert all or a portion of streamflow for any purpose, except for agricultural stock ponds with a capacity less than ten acre-feet, shall be designed and located to not impede the movement of native fish or to reduce streamflow to a level that would significantly affect the production of fish and other stream organisms.

(4) Riparian Setbacks. New development shall be setback from the upland edge of riparian vegetation a minimum of fifty feet within urban areas (inside the USL) and one hundred feet in rural areas (outside the USL), except as provided in subsection (2) of this section, and as follows:

(A) Permitted Uses Within the Setback. Permitted uses are limited to those specified in Section 23.07.172 (4)(A) (for wetland setbacks); provided, that the findings required by that section can be made. Additional permitted uses that are not required to satisfy those findings include pedestrian and equestrian trails, and nonstructural agricultural uses.

(B) Riparian Habitat Setback Adjustment. The minimum riparian setback may be adjusted through minor use permit approval, but in no case shall structures be allowed closer than ten feet from a stream bank, and provided the following findings can first be made:

Alternative locations and routes are infeasible or more environmentally damaging; and

Adverse environmental effects are mitigated to maximum extent feasible; and

The adjustment is necessary to allow a principal permitted use of the property and redesign of the proposed development would not allow the use with the standard setbacks; and

The adjustment is the minimum that would allow for the establishment of a principal permitted use.

(5) Alteration of Riparian Vegetation. Cutting or alteration of natural vegetation that protects a riparian habitat shall not be permitted except:

(A) For streambed alterations allowed by subsections (1) and (2) above;

(B) Where no feasible alternative exists;

(C) Where an issue of public safety exists;

(D) Where expanding vegetation is encroaching on established agricultural uses;
(E) Minor public works projects, including but not limited to utility lines, pipelines, driveways and roads, where the planning director determines no feasible alternative exists;
(F) To increase agricultural acreage; provided, that such vegetation clearance will:
(i) Not impair the functional capacity of the habitat,
(ii) Not cause significant streambank erosion,
(iii) Not have a detrimental effect on water quality or quantity,
(iv) Be in accordance with applicable permits required by the Department of Fish and Game;
(G) *To locate a principally permitted use on an existing lot of record where no feasible alternative exists and the findings of subsection (2) of this section can be made.*

Section 23.07.176 states:

The provisions of this section are intended to preserve and protect rare and endangered species of terrestrial plants and animals by preserving their habitats. Emphasis for protection is on the entire ecological community rather than only the identified plant or animal.
(1) Protection of Vegetation. Vegetation that is rare or endangered, or that serves as habitat for rare or endangered species shall be protected. Development shall be sited to minimize disruption of habitat.
(2) Terrestrial Habitat Development Standards.
(A) Revegetation. Native plants shall be used where vegetation is removed.
(B) Area of Disturbance. The area to be disturbed by development shall be shown on a site plan. The area in which grading is to occur shall be defined on site by readily identifiable barriers that will protect the surrounding native habitat areas.
(C) *Trails. Any pedestrian or equestrian trails through the habitat shall be shown on the site plan and marked on the site. The biologist's evaluation required by Section 23.07.170(1) shall also include a review of impacts on the habitat that may be associated with trails.*

4.4.3.2 Background and Project Description

The approximately 12,000 acres of PG&E's lands surrounding the ISFSI area include portions of the Irish Hills, about twelve miles of coastline, and a diverse mix of upland, riparian, and shoreline habitats. Of these 12,000 acres, about 200 are in crop production, about 2,500 are in grazing lands, with the remainder largely consisting of native habitat. Those habitat types include coastal scrub, chaparral, grassland, oak woodland, pine forest, riparian, freshwater marsh, and marine shoreline. The County LCP classifies most of these lands as Sensitive Resource Area (SRA), which is generally equivalent to the Coastal Act's Environmentally Sensitive Habitat Area (ESHA) designation.

The approximately 760 acres of the Diablo Canyon power plant complex within which the ISFSI project will be built is designated in the LCP as an Energy and Extractive Resource Area. Most of the area was disturbed during original construction of the power plant, although some areas within this security zone provide some habitat, including areas of coastal scrub and the lower reaches of Diablo Creek. The main ISFSI components will be built on previously disturbed areas that provide some relatively minor habitat values, as described below.

- ISFSI storage area: This site is on a flat area and cut slope created during the original Diablo Canyon construction. Much of the site has either naturally revegetated or has been planted and hydroseeded to provide slope stability. The vegetation consists of a mix of native and nonnative species and is primarily annual grasses with scattered coastal scrub components. The area above the cut slope and above the area to be graded for the storage site includes higher quality coastal scrub habitat and includes an abundant population of Nuttall's milk-vetch (*Astragalus nuttallii* var. *nuttallii*), which is classified as a sensitive species.

- Soil Disposal Site #1: This site is a partially paved storage yard located on fill placed over a culverted section of Diablo Creek. The culvert and fill was placed during the original Diablo Canyon power plant construction to provide level areas for the storage yard and an adjoining electrical switchyard. The site includes three small areas of hydrophytic vegetation – a 10-foot by 20-foot area of cattail (*Typha sp.*) and umbrella sedge (*Cyperus sp.*), a concrete drainage swale in which built-up sediment supports a stand of cattail and rabbit's foot grass (*Polypogon monspeliensis*), and a small depression supporting quailbush (*Atriplex lentiformis*) and poison hemlock (*Conium maculatum*). Soil placed in this disposal area will increase the amount of fill over the existing culverted and filled area, but will not result in additional fill in the free-flowing sections of Diablo Creek.

  The area downstream of this site where Diablo Creek exits the culvert consists of dense riparian habitat, including arroyo willow (*Salix lasiolepis*), giant creek nettle (*Urtica dioica var. holosericea*), California figwort (*Scrophularia californica*), wild cucumber (*Marah fabaceous*), giant horsetail (*Equisetum telmateia*), and hedge nettle (*Stachys bullata*). Further downstream, the creek banks support coastal scrub vegetation.

- Soil Disposal Site #2: This site, several hundred yards east of the power plant, is currently used for overflow parking and includes paved and graveled surfaces. It is located between the Diablo Canyon access road and the shoreline, and is adjacent to an area of restored native coastal shrub.

- Soil Disposal Site #3: This site is a paved parking area to the east of the power plant and adjacent to the service road leading to the ISFSI storage site. It includes a sloped area with a mix of vegetation including annual introduced grasses, various ruderal species, and planted coastal shrub species, including coyote brush (*Baccharis pilularis*), coast goldenbrush (*Isocoma mensiezii*), and California sagebrush (*Artemisia california*). Part of this site will be used in the realignment of the service road to be used in transporting the storage casks from the power plant to the Cask Transfer Facility.

Portions of these sites provide some habitat, although the habitat value is generally much lower than the high-quality habitat provided by the surrounding Diablo Canyon lands outside of the high security area. Species that either present or potential present at these sites include small mammals, including several species of rodent, various reptiles and amphibians, including snakes, lizards, and toads, and several bird species. While the Diablo Canyon lands outside of the high security area provide known or potential habitat for several federal or state-listed sensitive species, none of those species are known to use the habitat within the high security area, and it is generally believed that those areas have low potential to provide the necessary habitat.

4.4.3.3 Analysis of Conformity to Applicable LCP Provisions

LCP Section 23.07.160 establishes the habitat types that are designated Sensitive Habitat Areas (SRAs) in the LCP. These SRAs include wetlands, streams, and riparian areas, and are similar to the Coastal Act's environmentally sensitive habitat areas (ESHAs). LCP Section 23.07.170 applies to development proposed within or adjacent to areas of sensitive habitat (the LCP defines "adjacent" as within one hundred feet). LCP Section 23.07.170(1) requires that the permit application for such development evaluate the habitat features and whether the development will be consistent with biological continuance of the habitat, identify maximum feasible measures to protect the habitat, and identify the monitoring necessary to evaluate the mitigation measures. It also requires recommended conditions to restore damaged habitat, where feasible, and identification of significant negative impacts from noise, sediment or other potential disturbances. LCP Section 23.07.170(2) requires that findings for such a project determine that there will be no significant negative impact on the sensitive habitat, that the proposed use will be consistent with biological continuance of the habitat, and that the proposed use will not significantly disrupt the habitat. LCP Section 23.07.170(4) requires as a condition of approval that development within or adjacent to sensitive habitat include measures to ensure damaged habitats are restored. It also makes development subject, at a minimum, to setbacks identified in Sections 23.07.170-178.

LCP Section 23.06.174 describes requirements applying to coastal streams and their adjacent riparian areas. Provisions of this section are meant to preserve and protect natural hydrological and ecological functions of those streams. LCP Section 23.06.174(1) requires that development adjacent to coastal streams be sited and designed to protect that habitat and be compatible with continuance of that habitat. LCP Section 23.06.174(4) generally requires that new development be set back from the upland edge of riparian vegetation at least one hundred feet. This setback can be reduced to allow structures no closer than ten feet from a stream bank only if findings are made showing that alternative locations are infeasible or more environmentally damaging, that adverse environmental effects are mitigated to the maximum extent feasible, and that the adjustment is necessary to allow a principal permitted use of the property. The LCP also imposes grading requirements for sites in or near sensitive habitats. LCP Section 23.05.034(3) requires in most cases that grading not occur within one hundred feet of sensitive habitat.

ISFSI Location: The areas to be disturbed during ISFSI construction and operation are not considered sensitive habitat areas, although some are close to such areas. The proximity of construction activity to sensitive habitat areas requires mitigation measures to avoid and minimize potential impacts. The main mitigation measures related to revegetation of the disturbed areas and soil disposal areas to both replace lost vegetative cover and minimize adverse effects of soil erosion. Additionally, the findings and special conditions discussed later in the Water Quality section of this report will result in further prevention of adverse impacts to these sensitive habitat areas.

PG&E submitted as part of its project a *Native Vegetation Restoration and Monitoring Plan* (August 2004, and revised on November 8, 2004). Provisions of that revised plan are included as part of the proposed project. The plan describes the sites that will be disturbed by the project and measures to replant areas with long-term native plant cover, and is intended to conform to mitigation measures described in the project's Final EIR. Work done under the plan will be supervised by a restoration ecologist. Activities will include providing erosion control throughout the restoration work, planting and hydroseeding native species and inspecting the planted areas. The plan also includes performance standards, monitoring measures, remedial actions that may be required to ensure the planted areas are revegetated with an appropriate level of native plants, and the various reports that are to be submitted to the County.

Several components of the revised plan require additional modification; therefore **Special Condition 6** requires that PG&E submit, prior to permit issuance, a revised plan that incorporates two additional measures – first, a provision that all reports described in the plan be submitted for the Executive Director's review and approval as well as the County's; and second, a specification that seeds and propagules used to revegetate these areas be collected or obtained from sources within 35 miles of the Diablo Canyon lands, and that the plant vendor certify the origin of these seeds or propagules. This second provision will ensure that the native plants used in the revegetation program are suitable and appropriate for the local conditions at the project site.

With the mitigation measures described in the EIR and the revegetation plans, project activities are not expected to affect the sensitive habitat of Diablo Creek or its associated riparian area; however, soil placed at Soil Disposal Site #1 will increase the amount of fill over the section of Diablo Creek that has already been culverted and filled. LCP Section 23.07.170(4) requires as a condition of approval that development within or adjacent to sensitive habitat include measures to ensure damaged habitats are restored. Further, LCP Section 23.07.170(2) requires a determination that the proposed use will not cause significant damage to the habitat, that it be consistent with biological continuance of the habitat, and that the proposed use will not significantly disrupt the habitat. The special conditions described below in <u>Section 4.4.4 – Water Quality and Spill Prevention</u> will protect the creek and water quality from direct damage from the ISFSI-related activities. Additionally, **Special Condition 2**, which requires PG&E to submit a coastal development permit application for the potential decommissioning of the ISFSI or for proposed changes to the project not described in the submitted materials, provides a mechanism to allow future restoration of this and other sites associated with the project. Although the project will result in additional fill over the reach of the creek that will need to be restored, it

does not make future restoration infeasible. Therefore, the Commission finds that the proposed use will not cause significant damage or disruption to the habitat and that it will be consistent with biological continuance.

Sensitive Habitat Issues Related to Required Public Access: Many of the Diablo Canyon lands outside the ISFSI high security area are designated in the LCP as "Sensitive Resource Areas". These lands include several thousand acres of high quality native habitat supporting many sensitive plant and animal species. Habitat types include coastal scrub, chaparral, grassland, oak woodland, riparian, rocky shoreline, and others. These Diablo Canyon lands also include areas of agricultural operations – primarily cattle grazing on about 2000 acres and row crops on about 200 acres – and limited public access along the Pecho Coast Trail. There are also areas of ruderal and disturbed habitats.

Special Condition 3 related to public access require PG&E to provide maximum feasible shoreline access to these Diablo Canyon lands. At a minimum, this access must include increased availability along the Pecho Coast Trail and access to the existing roads and trails on the blufftops and coastal terraces in the northern portion of the property. **Special Condition 3** further requires PG&E to provide this access while minimizing potential adverse effects to other coastal resources, including sensitive habitat and species. Although the areas in which this access is required include several types of sensitive habitat, much of the access can be provided along existing accessways, which will assist in minimizing adverse effects to adjoining or nearby sensitive habitats. Further, the managed access plan to be submitted must describe the measures it will take to avoid impacts to sensitive habitat, and aspects of an approved plan may require additional coastal development permit review to ensure conformity to Coastal Act and LCP requirements.

Based on the above, the Commission finds that the proposed project, as conditioned, conforms to the sensitive habitat policies of the certified Local Coastal Program.

4.4.4 Water Quality and Spill Prevention & Response

4.4.4.1 Applicable LCP Provisions

Section 23.05.036 states, in relevant part:

> *(a) Sedimentation and Erosion Control Plan Required. Submittal of a sedimentation and erosion control plan for review and approval by the county engineer is required when:*
> *(1) Grading requiring a permit is proposed to be conducted or left in an unfinished state during the period from October 15th through April 15th;*
> *(2) Land disturbance activities, including the removal of more than one-half acre of native vegetation are conducted in geologically unstable areas, on slopes in excess of thirty percent on soils rated as having severe erosion hazard, or within one hundred feet of any watercourse shown on the most current seven and a half minute USGS quadrangle map;*

(3) The placing or disposal of soil, silt, bark, slash, sawdust or other organic or earthen materials from logging, construction and other soil disturbance activities above or below the anticipated high water line of a watercourse where they may be carried into such waters by rainfall or runoff in quantities deleterious to fish, wildlife or other beneficial uses.
When a sedimentation and erosion control plan is required, none of the activities described in subsection (a) (1) through (3) above shall be commenced until such plan is approved by the county engineer pursuant to this section.
(b) Sedimentation and Erosion Control Plan Preparation and Processing. Sedimentation and erosion control plans shall address both temporary and final measures and shall be submitted to the county engineer for review and approval. When such plans are required, they shall be prepared by a registered civil engineer or other qualified professional approved by the county engineer. Such plans shall be prepared in accordance with the San Luis Obispo County Standard Improvement Specifications and Drawings. Sedimentation and erosion control plans may be incorporated into and approved as part of a grading, drainage or other improvement plan, but must be clearly identified as a sedimentation and erosion control plan. Selection of appropriate control measures shall be based upon evaluation of project design, site conditions, pre-development erosion rates and the environmental sensitivity of adjacent areas.
(c) Plan Check, Inspection, and Completion. Where required by the county engineer, the applicant is to execute a plan check and inspection agreement with the county and the sedimentation and erosion control facilities inspected and approved before a certificate of occupancy is issued…

Section 23.05.040 states:

Standards for the control of drainage and drainage facilities provide for designing projects to minimize harmful effects of storm water runoff and resulting inundation and erosion on proposed projects, and to protect neighboring and downstream properties from drainage problems resulting from new development. The standards of Sections 23.05.042 through 23.05.050 are applicable to projects and activities required to have land use permit approval.

Section 23.05.042 states:

No land use or construction permit (as applicable) shall be issued for a project where a drainage plan is required, unless a drainage plan is first approved pursuant to Section 23.05.046. Drainage plans shall be submitted with or be made part of any land use, building or grading permit application for a project that:
(1) Involves a land disturbance (grading, or removal of vegetation down to duff or bare soil, by any method) of more than forty thousand square feet; or
(2) Will result in an impervious surface of more than twenty thousand square feet; or
(3) Is subject to local ponding due to soil conditions and lack of identified drainage channels; or

> *(4) Is located in an area identified by the county engineer as having a history of flooding or erosion that may be further aggravated by or have a harmful effect on the project; or*
> *(5) Is located within a flood hazard (FH) combining designation; or*
> *(6) Involves land disturbance or placement of structures within fifty feet of any watercourse shown on the most current USGS seven and a half minute quadrangle map; or*
> *(7) Involves hillside development on slopes steeper than ten percent; or*
> *(8) May, by altering existing drainage, cause an on-site erosion or inundation hazard, or change the off-site drainage pattern, including but not limited to any change in the direction, velocity or volume of flow, or*
> *(9) Involves development on a site adjacent to any coastal bluff.*

Section 23.06.120 states:

> *The storage and use of poisonous, corrosive, explosive and other materials hazardous to life or property are subject to the following standards, where applicable. The standards of these sections are in addition to all applicable state and federal standards, including but not limited to any regulations administered by the county health department, fire department, sheriff's office, agricultural commissioner and air pollution control district. In the event any standards of this chapter conflict with regulations administered by other federal, state, or county agencies, the most restrictive standards apply.*

4.4.4.2 Background and Existing Site Characteristics

The 760 acres that serve as the high-security zone for the project site include Diablo Creek, which flows about a mile through the area to the Pacific Ocean. The adjacent Diablo Canyon lands contain a number of seasonal streams, including Irish Canyon Creek, Pecho Creek, and Coon Creek, all flowing into the Pacific Ocean. The Diablo Creek watershed includes approximately 3000 acres, most of it upstream from the various components of the ISFSI project. Diablo Creek is a seasonal waterbody with highly variable flows, with peak flows caused primarily by rain and storm events. Portions of the creek were culverted during the initial construction of Diablo Canyon, and fill was placed over the culverted section to construct a switchyard and other components of the Diablo Canyon power plant complex. The ISFSI's Soil Disposal Site #1 is proposed to be located over part of this filled and culverted section of the creek. Runoff from much of the project site will not enter Diablo Creek, but will captured as sheet flow through the existing or proposed stormwater treatment and conveyance facilities at the Diablo Canyon complex.

Activities during project construction will include vegetation removal, grading and excavation, road construction and realignment, and construction of various structures. Some of these activities will be require construction of a concrete batch plant on site. All the activities will take place within previously disturbed or currently developed areas within the Diablo Canyon complex.

The ISFSI project will be subject to permitting and oversight by the Central Coast Regional Water Quality Board under provisions of several permits, including a National Pollutant Discharge Elimination System (NPDES) permit for the existing facilities at Diablo Canyon and a Construction Stormwater NPDES Permit. Those permits require Best Management Practices be used to avoid and minimize adverse effects to nearby waterbodies. Additionally, the project activities will take place within an area in which most runoff is already subject to permits requiring Best Management Practices, water quality control measures, and spill prevention and response measures.

Storage and use of hazardous radioactive materials, including the spent fuel, is subject to the requirements of the NRC. State and local governments are pre-empted by federal law from regulating activities related to nuclear safety and radiological hazards. Similarly, the design and use of the dry casks are subject solely to requirements imposed by the federal government.

4.4.4.3 Analysis of Conformity to Applicable LCP Provisions

Several sections of the LCP address issues related to water quality and the prevention and response to spills of hazardous materials. Due to the ISFSI's size and location, the LCP requires submittal of two plans – a Drainage Plan to be submitted prior to approval of the coastal development permit, and a Sediment and Erosion Control Plan to be submitted prior to issuance of the County's construction permit. The LCP allows the two required plans to be combined and establishes the need for additional and more detailed review of components of the plans prior to issuance of a construction permit. It also recognizes the need for ongoing monitoring and additional components that may be needed during project activities.

LCP Section 23.05.040 establishes drainage control standards to minimize the harmful effects of stormwater runoff, inundation, and erosion on proposed projects as well as existing neighboring and downstream properties. These standards are set out in LCP Section 23.05.042, which defines when a Drainage Plan is necessary, and requires that land use permits not be issued until a project's Drainage Plan is approved. The Drainage Plan is required for projects that involve any of the following:

- Disturb more than 40,000 square feet of land;
- Create impervious surfaces of more than 20,000 square feet;
- Are in an area subject to flooding, ponding, or erosion that could be worsened by the project;
- Are within a County-designated Flood Hazard area;
- Would disturb land within fifty feet of a watercourse;
- Includes development on slopes of greater than ten percent;
- May cause an on-site erosion or inundation hazard by altering existing drainage;
- May change the off-site drainage direction, velocity, or flow volume; or
- Includes development on a site adjacent to a coastal bluff.

LCP Section 23.05.044 states that when Drainage Plans are required, they must include estimates of existing and anticipated runoff from the project site, and must evaluate the effects of projected runoff on adjacent properties and on existing drainage facilities. The plan must also describe

existing surface flows, existing and finished site contours, and the location of final project elements, including drainage channels and any storage or conveyance facilities for runoff. Additionally, LCP Section 23.07.176(2)(A) requires that when vegetation is removed in areas of terrestrial habitat, native plants be used to revegetate the disturbed area. Finally, LCP Section 23.06.120 requires that the storage and use of poisonous, corrosive, explosive and other materials hazardous to life or property be subject to applicable state and federal standards.

LCP Section 23.05.036 requires applicants to submit a Sedimentation and Erosion Control Plan for projects involving grading between October 15 and April 15 of any year; or, removal of more than one-half acre of native vegetation in geologically unstable areas, on slopes exceeding thirty percent grade with soils rated as having severe erosion hazard, or within one hundred feet of any watercourse; or, placing materials below the high water line of a watercourse where it could be deleterious to fish, wildlife or other beneficial uses. When such a plan is required, this Section further specifies that it must be prepared by a registered civil engineer and must be based on an evaluation of the project design, site conditions, existing erosion rates, and the environmental sensitivity of the area. The plan must include temporary and final measures to prevent or reduce sedimentation and erosion, such as temporary mulching or seeding, flow interceptors or diverters, velocity energy absorbing devices, and dust control measures. Approval of the plan may be subject to a plan check and inspection agreement to allow the proposed facilities to be inspected. Many of the mitigation measures to be included in that plan have been specified in the project's EIR.

In August 2004, PG&E submitted one of the two plans, a *Drainage and Runoff Control Plan*, which included an evaluation of drainage patterns in the project area, described potential sources of pollution that could affect water quality, and described Best Management Practices that would avoid or reduce potential adverse impacts to water quality. To further ensure project activities are implemented in a manner protective of water quality and associated coastal resources, **Special Condition 1** further requires PG&E to submit to the Executive Director prior to project construction the County's approved construction permit. Issuance by the County of that permit first requires PG&E to submit the more detailed Sediment and Erosion Control Plan required by the LCP. That plan is to include specific provisions regarding drainage and erosion control, detailed site plans that show the locations and capacities of various erosion control and water quality devices such as beams, culverts, storm drains and stormwater treatment measures, and other similar mitigation elements. The plan will further describe the specific monitoring measures to be implemented, including use of a County-approved environmental monitor to ensure project activities conform to the environmental quality requirements of the LCP as well as other County regulations. Additionally, the previous findings in Section 4.4 and **Special Condition 6** regarding revegetation of disturbed areas will further allow project activities to conform to LCP requirements related to water quality protection.

With imposition of these conditions and with the measures to be implemented through these plans and through other associated permits, the Commission finds that the proposed project will conform to the water quality-related and spill prevention and response provisions of the certified Local Coastal Program.

4.4.5 Cultural and Archaeological Resources

4.4.5.1 Applicable LCP Provisions

LCP Section 23.11.030(23) states:

> *"Archaeologically sensitive areas" means areas where there is a high likelihood of the existence of archeological resources as shown on the land use element (Part III) combining designation maps and other information on file with the planning department.*

LCP Section 23.11.030(24) states:

> *"Archaeological resource" means any Native American or pre-Columbian artifact or human remains.*

LCP Section 23.07.194 states:

> *To protect and preserve archaeological resources, the following procedures and requirements apply to development within areas of the coastal zone identified as archaeologically sensitive.*
> *(1) Archaeologically Sensitive Areas. The following areas are defined as archaeologically sensitive:*
> *(A) Any parcel within a rural area which is identified on the rural parcel number list prepared by the California Archaeological Site Survey Office on file with the county planning department;*
> *(B) Any parcel within an urban or village area which is located within an archaeologically sensitive area as delineated by the official maps (Part III) of the land use element;*
> *(C) Any other parcel containing a known archaeological site recorded by the California Archaeological Site Survey Office.*
> *(2) Preliminary Site Survey Required. Before issuance of a land use or construction permit for development within an archaeologically sensitive area, a preliminary site survey shall be required. The survey shall be conducted by an archaeologist knowledgeable in Chumash Indian culture and approved by the environmental coordinator. The purpose of the preliminary site survey is to examine existing records and to conduct a preliminary surface check of the site to determine the likelihood of the existence of resources. The report of the archaeologist shall be submitted to the planning department and considered in the evaluation of the development request by the applicable approval body.*
> *(3) When a Mitigation Plan is Required. If the preliminary site survey determines that proposed development may have significant effects on existing, known or suspected archaeological resources, a plan for mitigation shall be prepared by the archeologist. The purpose of the plan is to protect the resource. The plan may recommend the need for further study, subsurface testing, monitoring during construction activities, project redesign, or other actions to mitigate the impacts on the resource. The mitigation plan*

> *shall be submitted to and approved by the environmental coordinator, and considered in the evaluation of the development request by the applicable approval body.*
> *(4) Required Finding. A land use or construction permit may be approved for a project within an archeologically sensitive area only where the applicable approval body first finds the project design and development incorporates adequate measures to ensure protection of significant archeological resources.*
> *(5) Archeological Resources Discovery. In the event archeological resources are unearthed or discovered during any construction activities, the standards of Section 23.05.140 of this title shall apply.*

LCP Section 23.05.140 states:

> *In the event archeological resources are unearthed or discovered during any construction activities, the following standards apply:*
> *(1) Construction activities shall cease, and the environmental coordinator and planning department shall be notified so that the extent and location of discovered materials may be recorded by a qualified archeologist, and disposition of artifacts may be accomplished in accordance with state and federal law.*
> *(2) In the event archeological resources are found to include human remains, or in any other case when human remains are discovered during construction, the county coroner is to be notified in addition to the planning department and environmental coordinator so that proper disposition may be accomplished.*

4.4.5.2 Background and Analysis of Conformity to Applicable LCP Provisions

The Diablo Canyon area is the ancestral home of the Chumash people. The area provided abundant food resources from both the land and the sea and supported a complex and diverse culture. Evidence of Chumash habitation has been found at several sites in the Diablo Canyon lands, including a major site within the area of the power plant complex.

LCP Section 23.07.104 applies to the protection of archaeological resources and requires a preliminary survey in areas designated in the official land use maps as an archaeologically sensitive area or on parcels with a known archaeological site. If the preliminary survey determines that the proposed development may have significant effects on a site, a mitigation plan including measures to protect the potential site, artifacts, or remains must be submitted. It further requires that a land use permit be issued for such an area only when findings are made stating that the project design and development includes measures adequate to ensure protection of significant archaeological resources. Finally, LCP Section 23.07.104(5) requires that if archaeological resources are discovered during construction, that activities stop and the in the event of construction stop and the County's environmental coordinator and planning department be notified, pursuant to LCP Section 23.05.140. This is intended to allow the resources to be recorded by a qualified archaeologist and to allow proper disposition of the resources in accordance with state and federal law.

The various components of the ISFSI are to be built almost entirely on previously disturbed areas within the Diablo Canyon power plant complex. Although the Diablo Canyon lands are known to contain many archaeological sites, including some considered significant, preliminary surveys done in and around the project site suggest there is a low likelihood of new discoveries, due largely to the previous disturbances that occurred during the original power plant construction. Even so, because there is a possibility of finding additional archaeological resources, several special conditions address the potential impacts of finding new archaeological sites during the project. **Special Condition 1** requires PG&E provide to the Executive Director prior to starting construction a copy of an approved construction permit from the County. As noted previously, among the requirements for issuance of the County's construction permit is submittal of a *Construction Treatment Plan* that describes the measures to be taken if cultural or archaeological resources are found. This plan is to be prepared by a County-qualified archaeologist and is to specify the procedures for stopping work and notifying the County and other interested parties in the event of a discovery, procedures for recording, evaluating, and mitigating any discoveries, and procedures to be followed if human remains are found. **Special Condition 7** additionally requires PG&E to submit that plan for Executive Director review and approval prior to project construction. Further, **Special Condition 3** requires PG&E to avoid or minimize impacts to significant coastal resources, including archaeological resources, during development of its proposed managed public access plan. As part of that plan, PG&E will be required to provide appropriate protection or buffers around the known sites and will be required to notify the County if new sites are found, pursuant to LCP Section 23.07.104(5).

With imposition of these conditions, the Commission finds that the project design and development incorporates adequate measures to ensure that archaeological resources will be protected and that the development conforms to the cultural resource protection policies of the certified LCP.

4.4.6 Water and Sewage Service

4.4.6.1 Applicable LCP Provisions

Section 23.04.430 states:

> *A land use permit for new development that requires water or disposal of sewage shall not be approved unless the applicable approval body determines that there is adequate water and sewage disposal capacity available to serve the proposed development, as provided by this section. Subsections (1) and (2) of this section give priority to infilling development within the urban service line over development proposed between the USL and URL. In communities with limited water and sewage disposal service capacities as defined by resource management system alert levels II or III:*
>
> *(5) A land use permit for development to be located between an urban services line and urban reserve line shall not be approved unless the approval body first finds that the capacities of available water supply and sewage disposal services are sufficient to accommodate both existing development, and allowed development on presently-vacant parcels within the urban services line.*

(6) Development outside the urban services line shall be approved only if it can be served by adequate on-site water and sewage disposal systems, except that development of a single-family dwelling on an existing parcel may connect to a community water system if such service exists adjacent to the subject parcel and lateral connection can be accomplished without trunk line extension.

LCP Section 23.04.430 requires that land use permits for new development requiring water or sewage disposal not be approved without a determination by the approval body that there is adequate water and sewage capacity to serve the proposed project.

4.4.6.2 Analysis of conformity to applicable LCP provisions

The proposed project will require additional water and sewage service beyond that currently required at Diablo Canyon. On August 12, 2004, PG&E submitted a report, *Water and Sewage Service for Used Fuel Storage Project*, describing the proposed project's water supply and sewage service needs during construction and operation. The report describes water and sewage use during ISFSI construction and operations as follows:

Water use:

- During ISFSI construction: The proposed project's Phase I construction (consisting primarily of grading, road construction, and two storage pads) would require about 1.5 acre-feet of water (about 500,000 gallons) for soil compaction, dust control, concrete mixing, and equipment washing. Phase II construction (primarily building five storage pads) would require about 0.5 acre-feet of water (about 175,000 gallons) per pad. These water needs are well within Diablo Canyon's existing water supply, which is provided through onsite wells and stored in a five million gallon reservoir and two tanks of 100,000 and 300,000 gallon capacity, respectively. The existing water demand of the power plant operating at full capacity is only about one-third of the system's capacity.

- During ISFSI operation: The ISFSI storage casks are air-cooled and will not require additional personnel, so PG&E anticipates that no additional water will be needed during the facility operation.

Sewage service:

- During ISFSI construction: During construction, PG&E will provide portable toilets for the onsite construction crew and will handle them in accordance with state and County requirements.

- During ISFSI operation: ISFSI operations will require no additional sewage service above the existing service because it is co-located within the existing Diablo Canyon complex and will not require additional personnel.

Based on the information provided in PG&E's reports, the Commission finds that the proposed project will have adequate water supply and sewage capacity and that it conforms to the LCP policies regarding water and sewage service.

4.4.7 Visual Resources

4.4.7.1 Applicable LCP Provisions

LCP Policy 10-1 states:

> *Unique and attractive features of the landscape, including but not limited to unusual landforms, scenic vistas and sensitive habitats are to be preserved, protected, and in visually degraded areas restored where feasible.*

LCP Policy 10-2 states:

> *Permitted development shall be sited so as to protect views to and along the ocean and scenic coastal areas. Wherever possible, site selection for new development is to emphasize locations not visible from major public view corridors. In particular, new development should utilize slope created "pockets" to shield development and minimize visual intrusion.*

LCP Policy 10-5 states:

> *Grading, earthmoving, major vegetation removal and other landform alternations within public view corridors are to be minimized. Where feasible, contours of the finished surface are to blend with adjacent natural terrain to achieve consistent grade and natural appearance.*

4.4.7.2 Analysis of conformity to LCP provisions

The proposed project will be located within an area heavily developed to provide energy production. This area is surrounded by a larger area of relatively undisturbed open space that offers significant visual and scenic resources along several miles of coastline. The ISFSI consists of relatively low-profile structures that are visually subservient to the other development now existing on the site.

The LCP policies related to scenic and visual resources require that unique landscape features, including sensitive habitats, are to be preserved, protected, and in visually degraded areas, restored where feasible, that permitted development protect views to and along the ocean, and that where possible, new development not be visible from major public view corridors, and that grading, earthmoving, major vegetation removal and other landform alternations within public view corridors be minimized.

A visual resource assessment performed during the project's CEQA review indicated that the coastal portion of the areas around the power plant complex is of high visual sensitivity but that the immediate project site is considered to have moderate to low visual sensitivity. The EIR includes simulated photos of the proposed project from various viewpoints, including the ocean. Because most of the permanent ISFSI structures will be located behind a hillside, the analysis further determined that views of the proposed project from areas away from the power plant complex would be very limited, due to the surrounding landforms and the security zone in the coastal waters offshore of the power plant, which restricts access within 2,000 yards of the power plant. Based on review of the current effects of the ISFSI, including the evaluation and visual representations in the EIR, the project, the Commission finds the proposed project, as conditioned, is consistent with the visual resource policies of the LCP.

4.4.8 Energy Production

4.4.8.1 Applicable LCP Provisions

The area where the ISFSI is to be built is designated in the County's General Plan as Energy and Extractive Resource lands. LCP Sections 23.07.040 and 23.07.042 allow energy production and modifications to energy facilities as designated uses in these areas.

4.4.8.2 Analysis of Conformity to Applicable LCP Provisions

The primary purpose of the ISFSI is to store spent fuel generated by the Diablo Canyon power plant. While the ISFSI is not, in and of itself, an energy-producing development, the existing power plant needs the storage provided by the ISFSI to continue operating. Additionally, other options to provide this storage have been determined to be either infeasible or have the potential to cause greater adverse harm to public safety or the environment. Therefore, the Commission finds that the proposed project, as conditioned, conforms to the County's policies regarding energy production facilities as they relate to this area of the coastal zone.

5.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT

On April 20, 2004, the County of San Luis Obispo certified the Environmental Impact Report done for the ISFSI. In addition, Section 13096 of the Commission's administrative regulations requires Commission approval of CDP applications to be supported by a finding showing the application, as modified by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of the CEQA prohibits approval of a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment.

As discussed above, the proposed project has been conditioned to be found consistent with the policies of the Coastal Act. Mitigation measures that will minimize or avoid all significant adverse environmental impacts have been required. As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse impact that the activity would have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of CEQA.

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

General References:

- County of San Luis Obispo Coastal Development Permit (CDP) #D010153D (April 20, 2004), associated files, and appeal documents.
- Final Environmental Impact Statement (January 2004)
- Certified County of San Luis Obispo Local Coastal Program
- San Luis Obispo County's Local Coastal Program Periodic Review (August 2001)
- PG&E's Application and Associated Amendments for the Nuclear Regulatory Commission's Independent Spent Fuel Storage Installation License at Diablo Canyon
- PG&E's Safety Analysis Report
- Completing the Coastal Trail, California Coastal Conservancy, and associated California Coastal Trail Maps, California Coastal Commission (January 2003)

References Cited in Section 4.4.2 – Geologic Hazards:

Benumof, B.T., and Griggs, G.B., 1999, The dependence of seacliff erosion rates on cliff material properties and physical processes: San Diego County, California: Shore and Beach, v. 67, p. 29-41.

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Hanson, K.L., Lettis, W.R., McLaren, M.K., Savage, W.U., and Hall, T.N., 2004, Style and rate of Quaternary Deformation of the Hosgri Fault Zone, Offshore South-Central California, *in* Keller, M., ed., Evolution of Sedimentary Basins/Offshore Oil and Gas Investigations--Santa Maria Province, U.S. Geological Survey Bulletin 1995-BB, p. 1-33.

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Helmberger, D.V., Somerville, P.G., and Garnero, E., 1992, The location and source parameters of the Lompoc, California, earthquake of 4 November 1927: Bulletin of the Seismological Society of America, v. 82, p. 1678-1709.

Hoskins, E.R., and Griffith, J.R., 1971, Hydrocarbon potential of northern and central California offshore, *in* Cram, I.H., ed., Future petroleum provinces of the United States--Their geology and potential: Tulsa, Oklahoma, American Association of Petroleum Geologists Memoir 15, p. 212-218.

McLaren, M.K., and Savage, W.U., 2001, Seismicity of south-central coastal California: October 1987 through January 1997: Bulletin of the Seismological Society of America, v. 91, p. 1629-1658.

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Nuclear Regulatory Commission, 1991, Supplement 34 to NUREG-0675, Safety Evaluation Report for the Diablo Canyon Nuclear Power Plant, Units 1 and 2: Washington DC, Nuclear Regulatory Commission.

Peterson, M., Beeby, D., Bryant, W., Cao, C., Cramer, C., Davis, J., Reichle, M., Saucedo, G., Tan, S., Taylor, G., Toppozada, T., Treiman, J., and Wills, C., 1999, Seismic shaking hazard maps of California: Sacramento, California, California Division of Mines and Geology, Seismic Shaking Hazard Maps, Map Sheet 48.

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EXHIBITS

EXHIBIT 1: Location Map
EXHIBIT 2: Diablo Canyon lands
EXHIBIT 3: Site Map
EXHIBIT 4: Pecho Coast Trail Map
EXHIBIT 5: Regional Tectonic Map
EXHIBIT 6: Local Tectonic Map
EXHIBIT 7: Site Geologic Map
EXHIBIT 8: Geologic evolution
EXHIBIT 9: Crouch model; from paper
EXHIBIT 10: McLaren and Savage Model; from paper
EXHIBIT 11: Namson Cross Section
EXHIBIT 12: Plan View Hosgri seismicity
EXHIBIT 13: X-Section view Hosgri Seismicity
EXHIBIT 14: USGS & PG&E Seismograph locations
EXHIBIT 15: LTSP & Hosgri spectra, horizontal
EXHIBIT 16: LTSP & Hosgri spectra, vertical
EXHIBIT 17: ILP Spectra, horizontal
EXHIBIT 18: ILP Spectra, horizontal
EXHIBIT 19: Cross section showing adverse bedding, clay beds SAR Figure 2.6-18
EXHIBIT 20: Slide Mass Model 1 2.6-47
EXHIBIT 21: Slide Mass Model 2 2.6-48
EXHIBIT 22: Slide Mass Model 3 2.6-49
EXHIBIT 23: Geologic Map of site; Shoreline Retreat Study Figure 2
EXHIBIT 24: Retreat Rate tables; Shoreline Retreat Study Tables 2 and 3
EXHIBIT 25: Geologic Map of landslide; includes setback line; Setback Study Figure 2
EXHIBIT 26: Cross section of landslide; Setback Study Figure 3
EXHIBIT 27: Inclinometer study; Setback Study Figure 6

Figure ES-1 Location of Proposed Project

EXHIBIT NO. 1
APPLICATION NO.
A-3-SLO-04-035

EXHIBITS

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EXHIBIT 27: Inclinometer study; Setback Study Figure 6

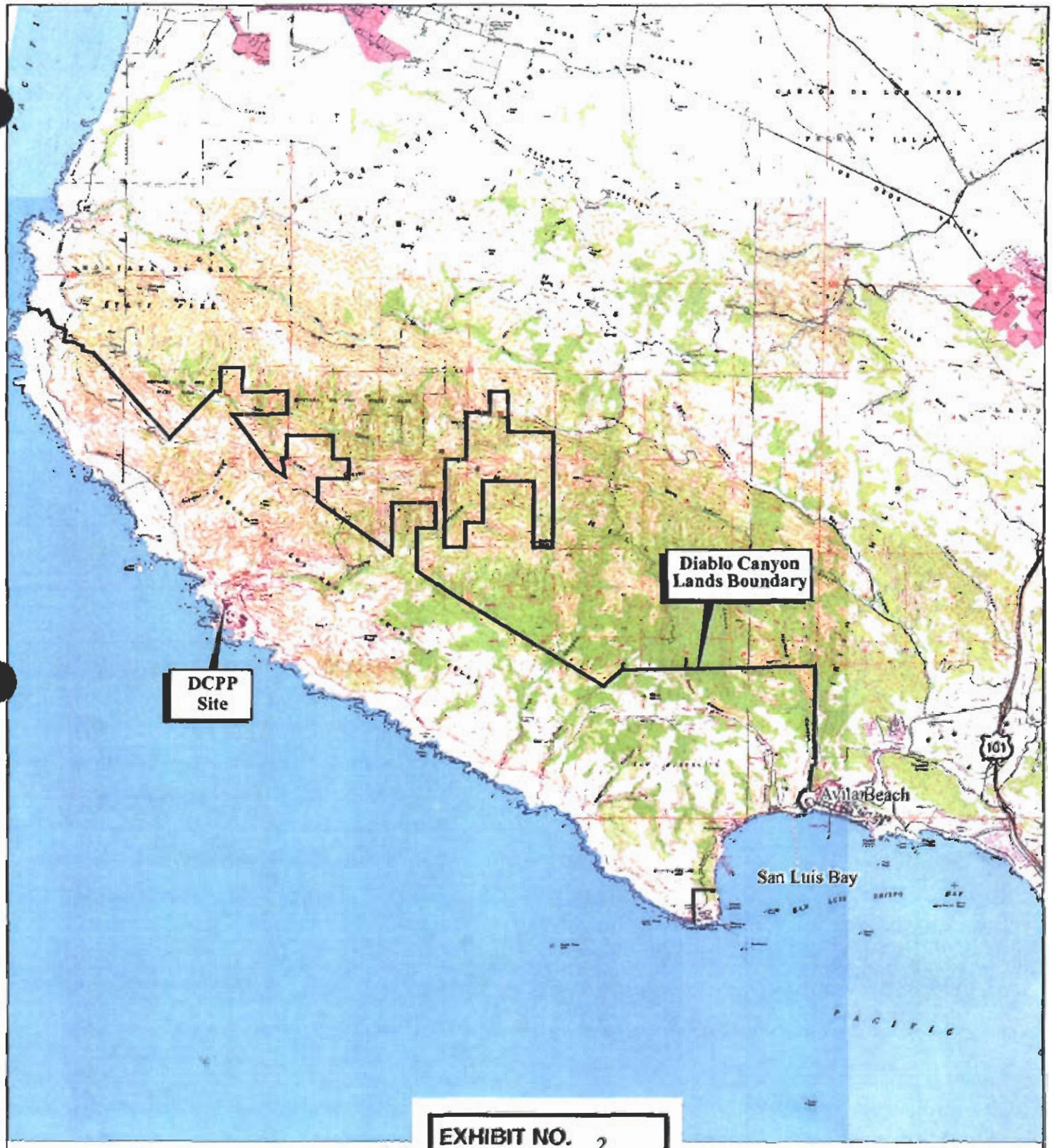


EXHIBIT NO. 2
APPLICATION NO.
A-3-SLO-04-035

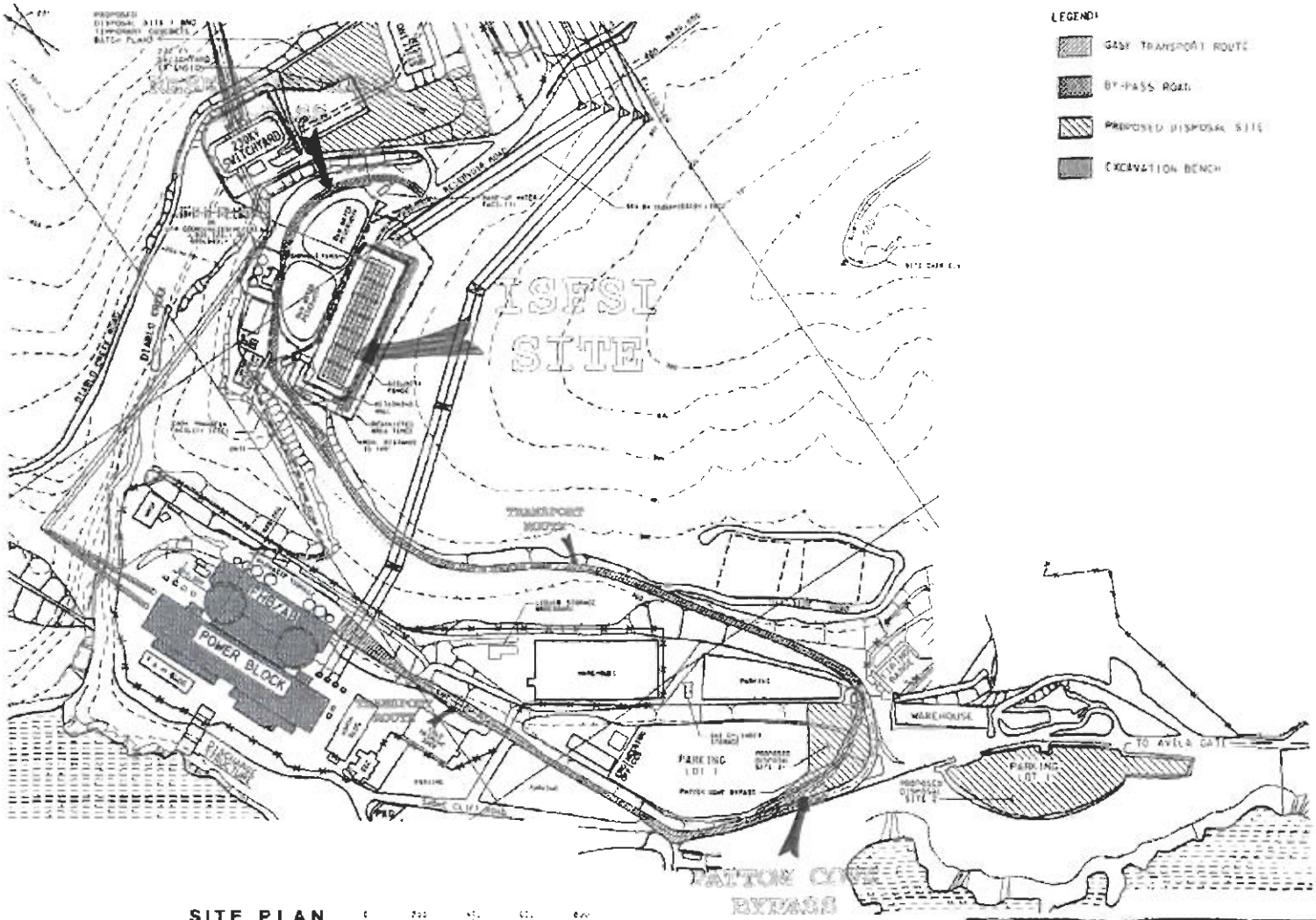
Figure PRO-2

Proposed Diablo Canyon ISFSI

N

0 4000 8000 Feet

Diablo Canyon Power Plant Location



SITE PLAN

REVISIONS		
NO.	DATE	DESCRIPTION

Cannon ASSOCIATES

DIABLO CANYON POWER PLANT
USED FUEL STORAGE PROJECT

FIGURE 1 – SITE PLAN
COUNTY OF SAN LUIS OBISPO, CALIFORNIA

DRAWN BY ERC	DATE 05/06/04	CA JOB NO. 040024
CHECKED BY LPM	SCALE N.T.S.	SHEET 1 OF 1

EXHIBIT NO. 3
APPLICATION NO.
A-3-SLO-04-035

PECHO COAST TRAIL ACCESSWAY MANAGEMENT PLAN

Trail Overview

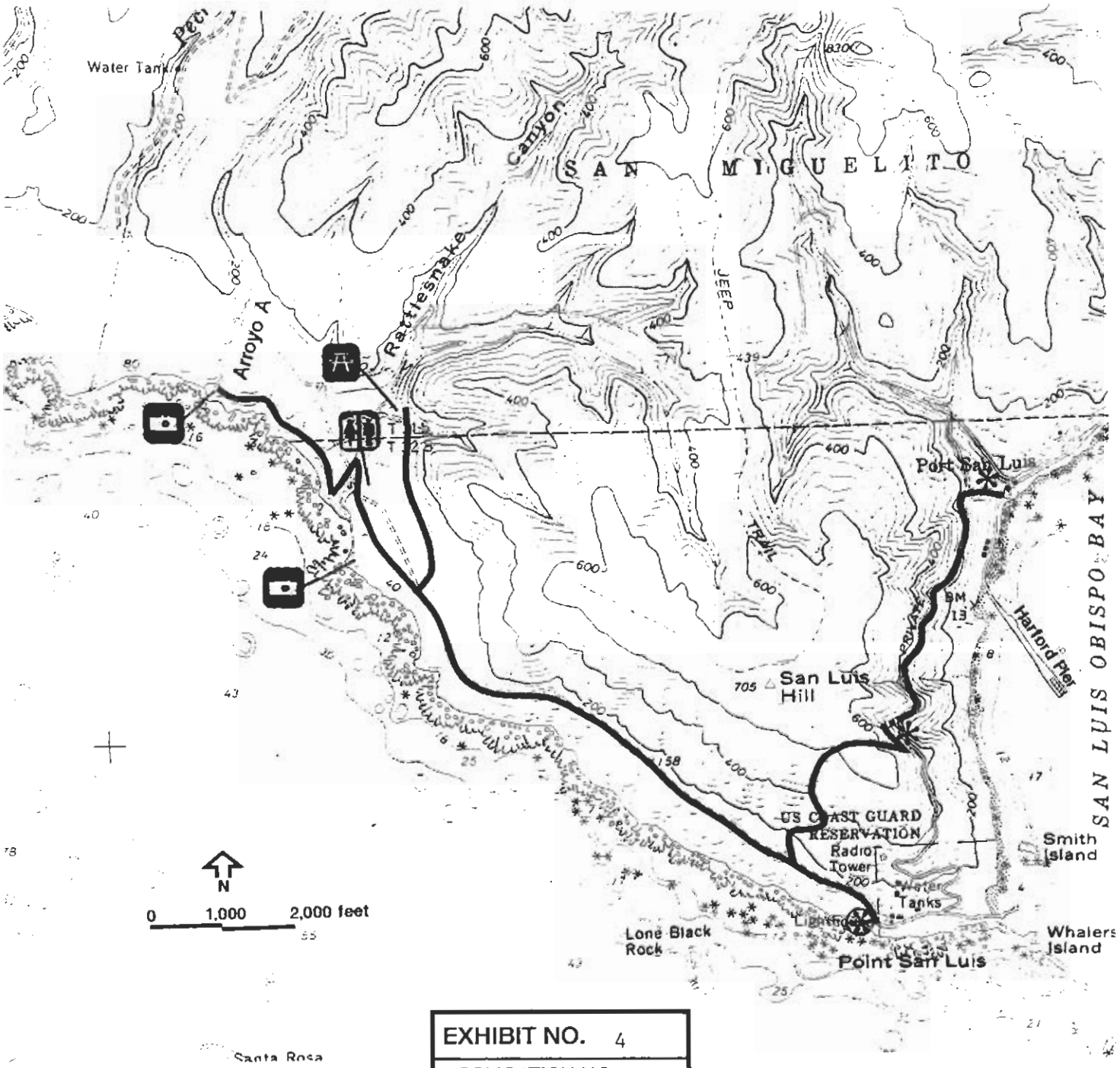


EXHIBIT NO. 4
APPLICATION NO.
A-3-SLO-04-035

LEGEND

- TRAIL
- STAIRS
- OBSERVATION AREA
- PICNIC AREA
- SANITARY FACILITIES
- TRAILHEAD
- FUTURE TRAILHEAD

Figure 5

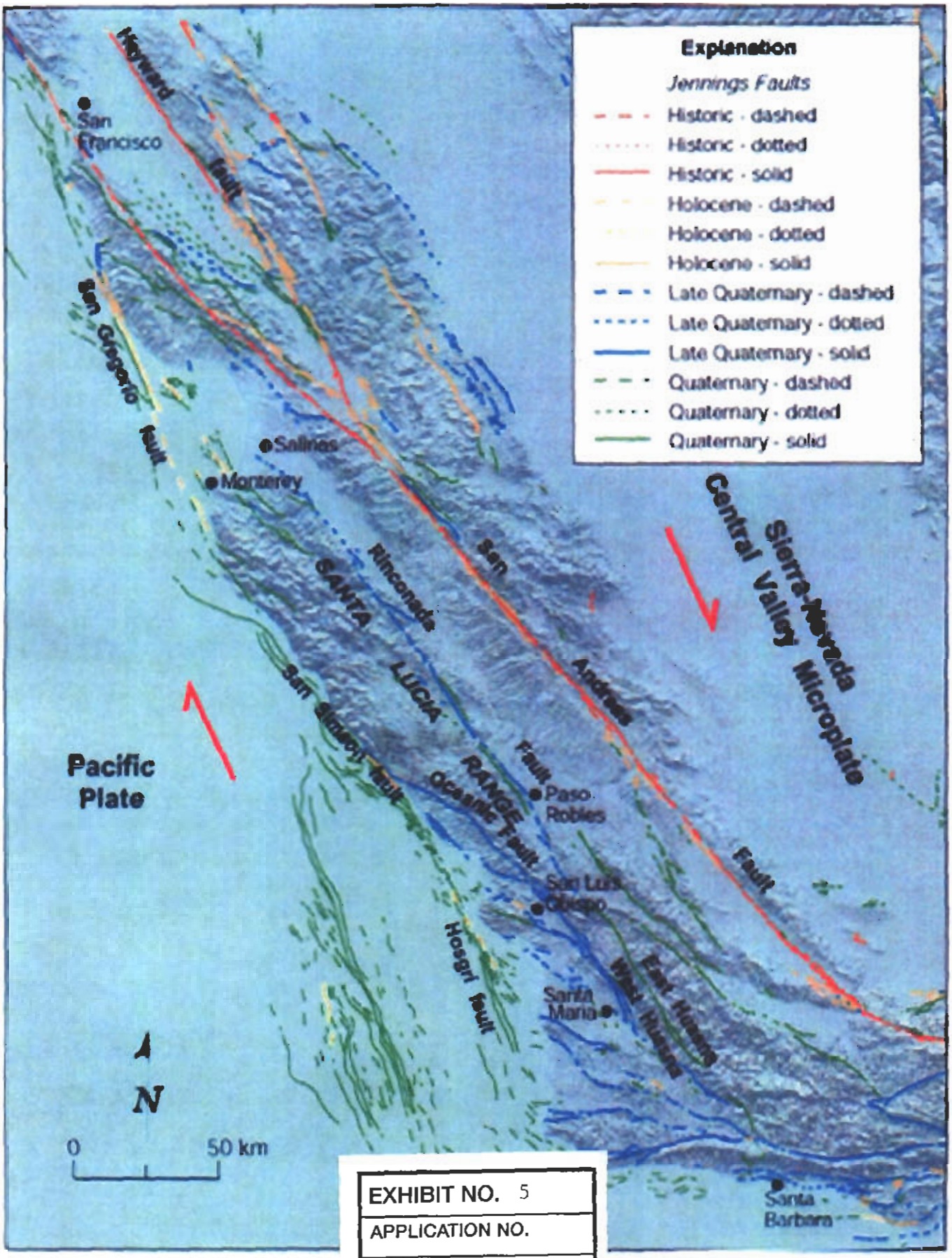
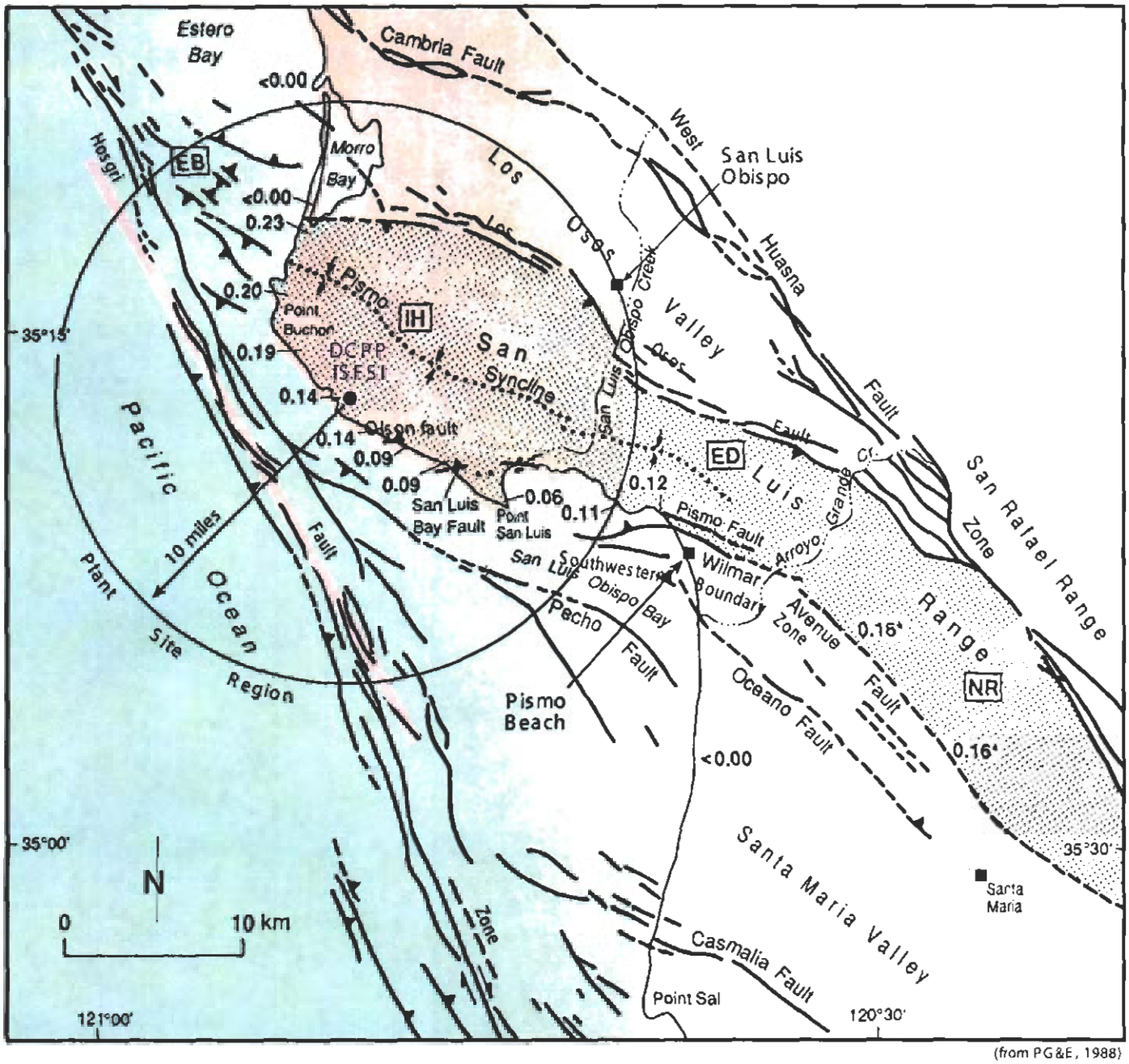


EXHIBIT NO. 5

APPLICATION NO.

A-3-SLO-04-035

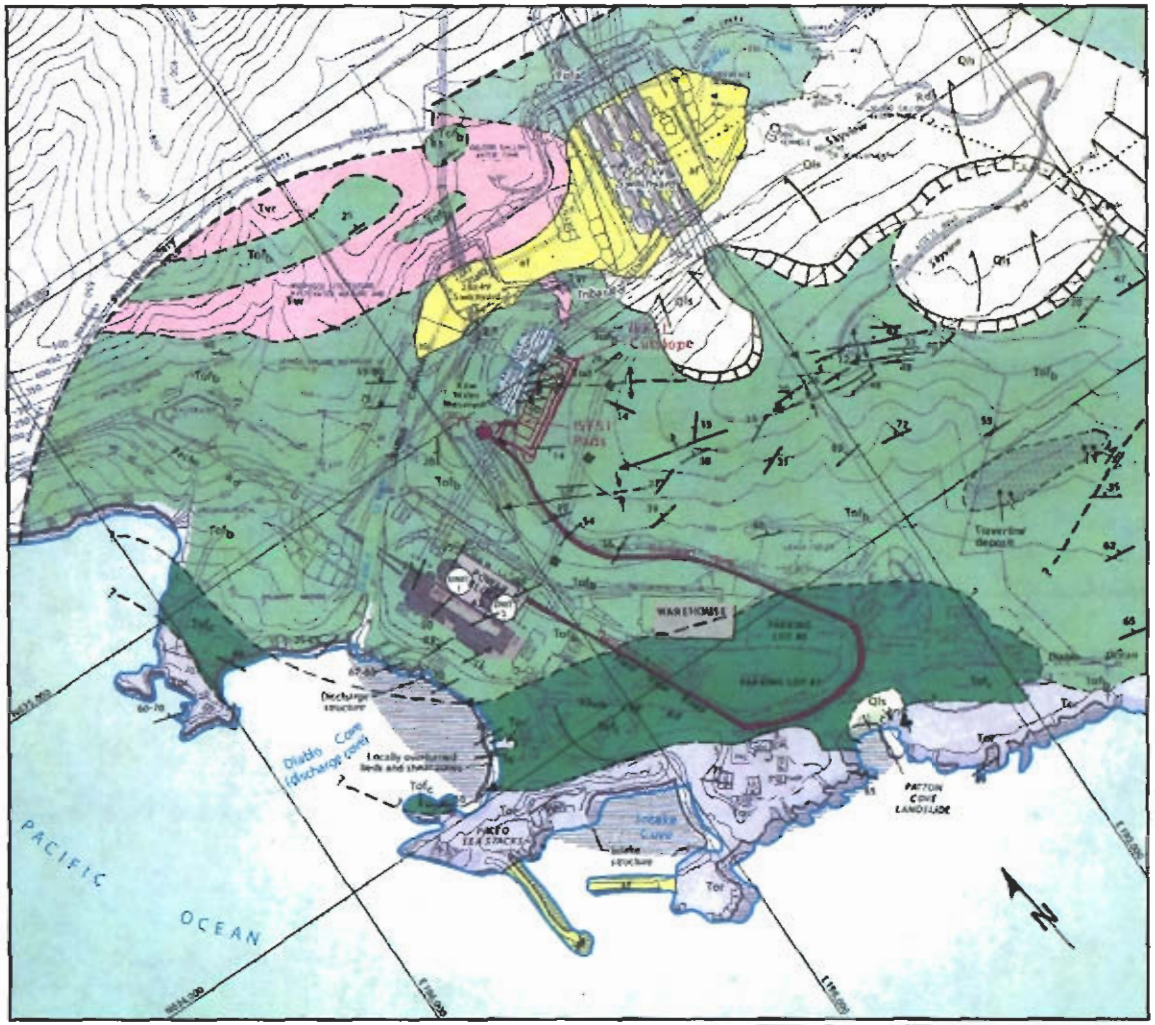
A



(from PG&E, 1988)

EXHIBIT NO. 6
APPLICATION NO.
A-3--SLO-04-035

B



Explanation

af Artificial fill (engineered), only major fills shown

Qls Quaternary landslide deposits

Tvr Volcanic rock (middle Miocene), diabase intrusive sills and dikes

Obispo Formation

(lower and middle Miocene) - bedded dolomitic sandstone, siltstone, and claystone with tuffaceous beds, locally calcareous, some chert and volcanic rock lenses

Member Tol - Sandstone and dolomite

Tolc Unit a - diatomaceous siltstone and tuffaceous sandstone; yellow-brown to orc thick to massive bedding

Tolb Unit b - dolomite, dolomitic siltstone, dolomitic sandstone and sandstone, medium to very thick bedding

Unit c - shale, claystone and siltstone, thin to medium bedding, extensively sheared

Tor Member Tor - Volcanic rock, zeolitized and silicified tuff

Tertiary

Bedrock fault or shear zone, dashed where approximate, queried where uncertain, arrows show sense of displacement

Geologic contact, solid line where well-defined, dashed where approximate, queried and/or dotted where uncertain

Cut or fill slope

Large landslides. Arrows indicate direction of movement, hachures define head scarp. (Smaller landslides are not shown)

500-kV tower

10 Generalized strike and dip of bedding

Parasitic folds on south limb of Pismo syncline

Axis of anticline, plunge indicated by larger arrow, dashed where approximately located

Axis of syncline, plunge indicated by larger arrow, dashed where approximately located

Axis of monocline, plunge indicated by larger arrow, dashed where approximately located

Steep sea cliff

65 Strike and dip of fault

Spring

Note: Except for small faults at and near the ISFSI site, only major geologic structures and bedrock units, and large landslides, are shown.

Data Sources

Base Map:
PG&E Civil Site Facilities Layout Plan (modified 1994)

Topography from PG&E, 1986 (and later revisions), Plot plan drawing 471124

Geology modified from:
C.A. Hall, Jr., W.G. Ernest, S.W. Prior and J.W. Siese, 1979, Geologic map of the San Luis Obispo-San Simeon region, U.S. Geological Survey Miscellaneous Investigation I-1097.

C.A. Hall Jr., 1973, Geologic map of the Morro Bay South and Port San Luis Quadrangles, San Luis Obispo County, California, U.S. Geological Survey Miscellaneous Field Studies Map MF-511, scale 1:24,000.

EXHIBIT NO. 7

APPLICATION NO.

A-3-SLO-04-035

FSAR UPDATE

DIABLO CANYON ISFSI

FIGURE 2.6-6
GEOLOGIC MAP OF BEDROCK AND LANDSLIDES IN THE PLANT SITE AREA

Revision 0 June 2004

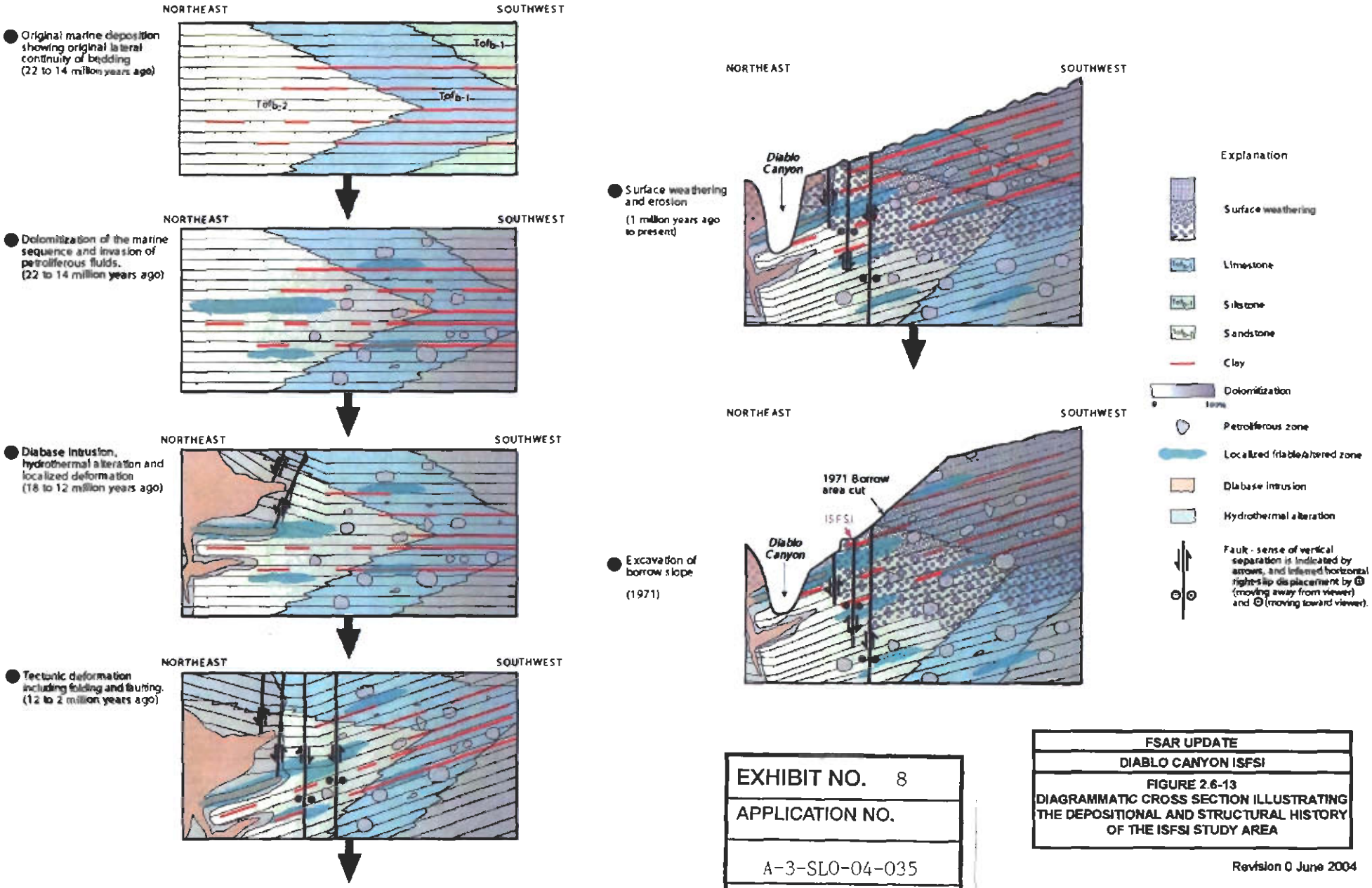


EXHIBIT NO. 8

APPLICATION NO.

A-3-SLO-04-035

FSAR UPDATE

DIABLO CANYON ISFSI

FIGURE 2.6-13
DIAGRAMMATIC CROSS SECTION ILLUSTRATING THE DEPOSITIONAL AND STRUCTURAL HISTORY OF THE ISFSI STUDY AREA

Revision 0 June 2004

Northeastern Santa Maria Basin

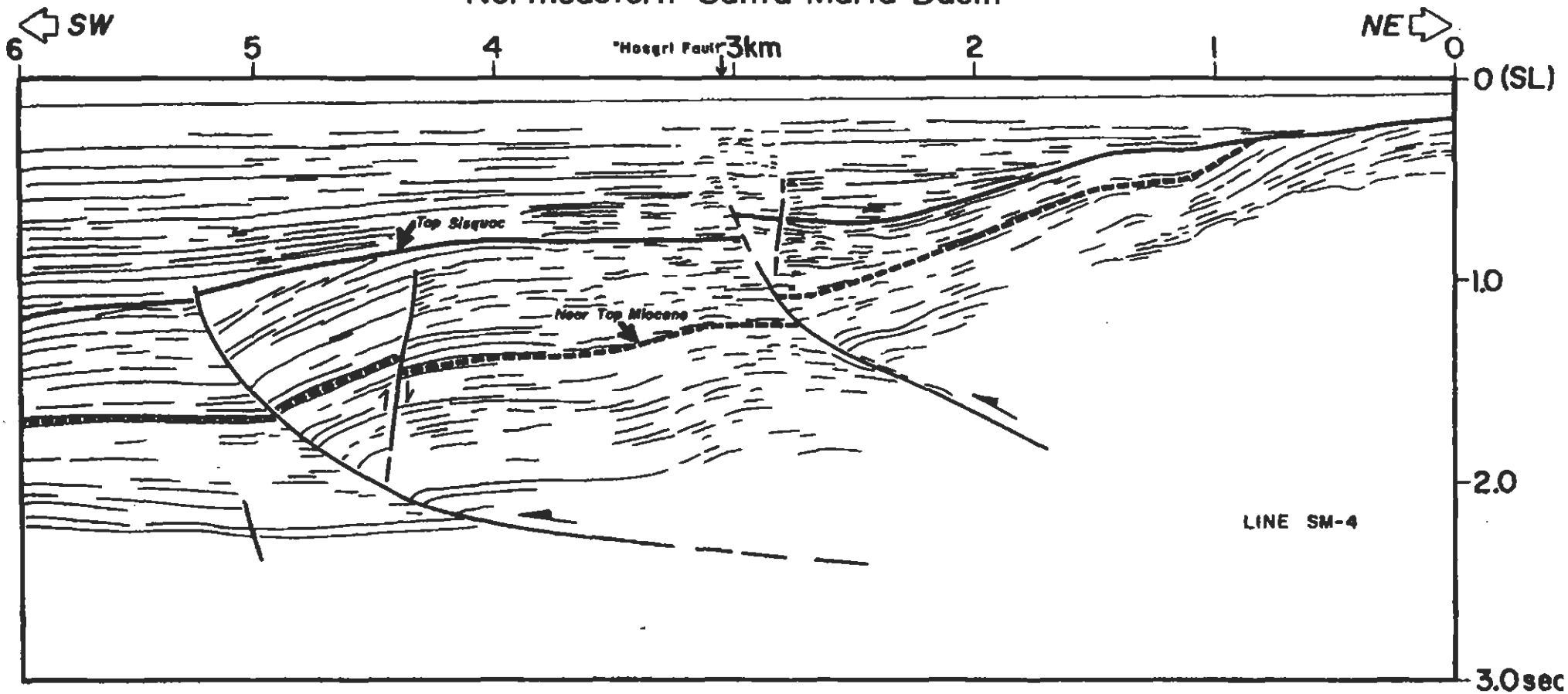
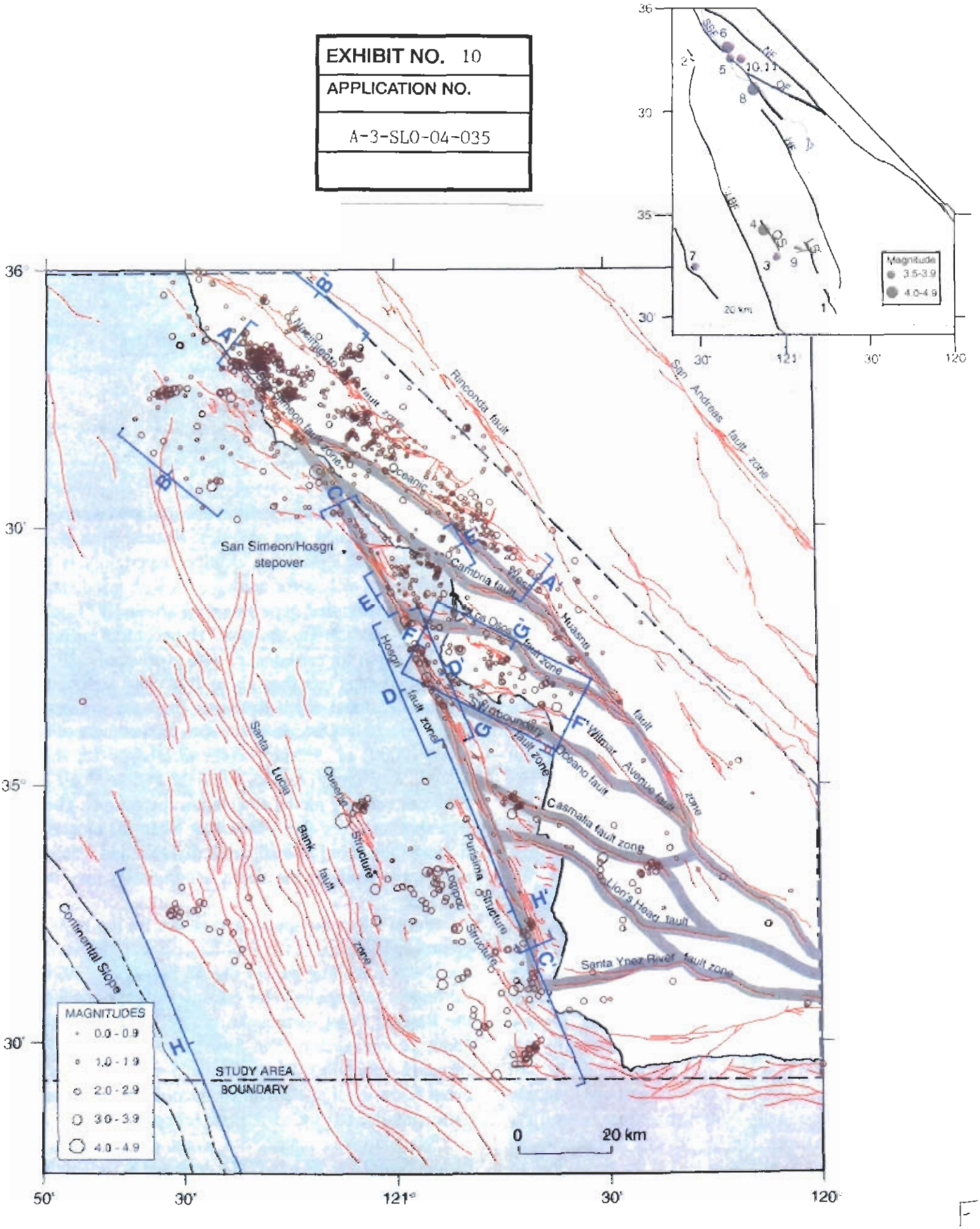
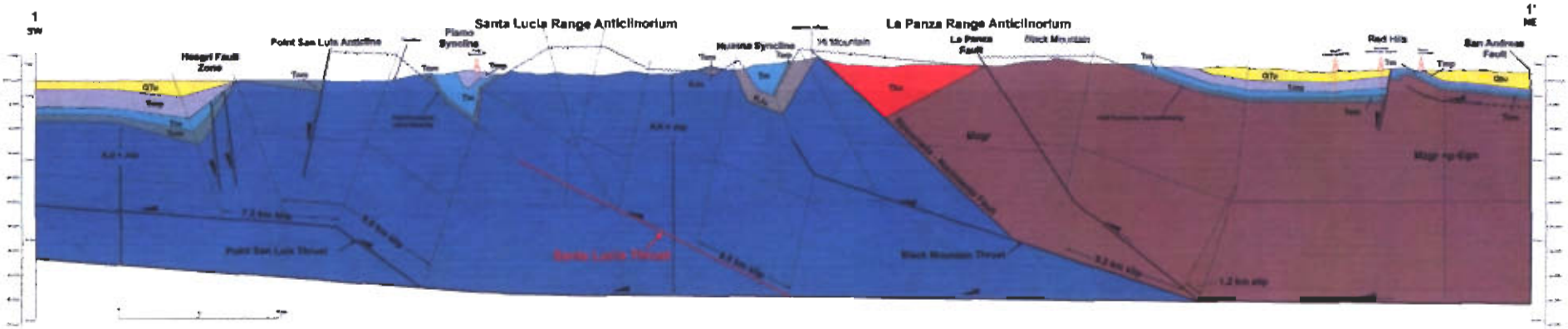


EXHIBIT NO. 9
APPLICATION NO.
A-3-SLO-04-035

EXHIBIT NO. 10
APPLICATION NO.
A-3-SLO-04-035





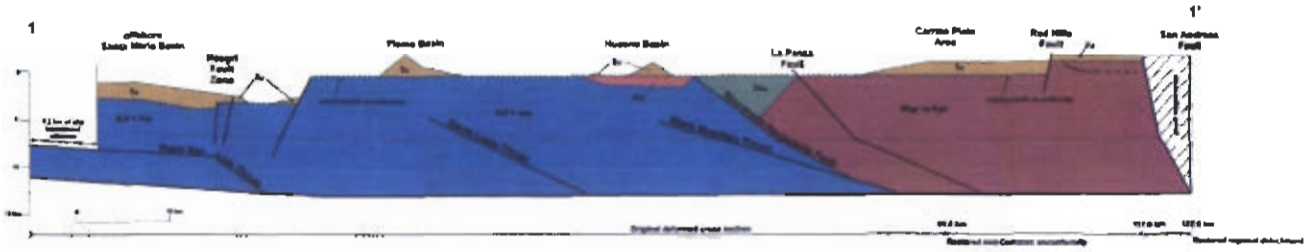


EXHIBIT NO. 11
APPLICATION NO.
A-3-SLO-04-025

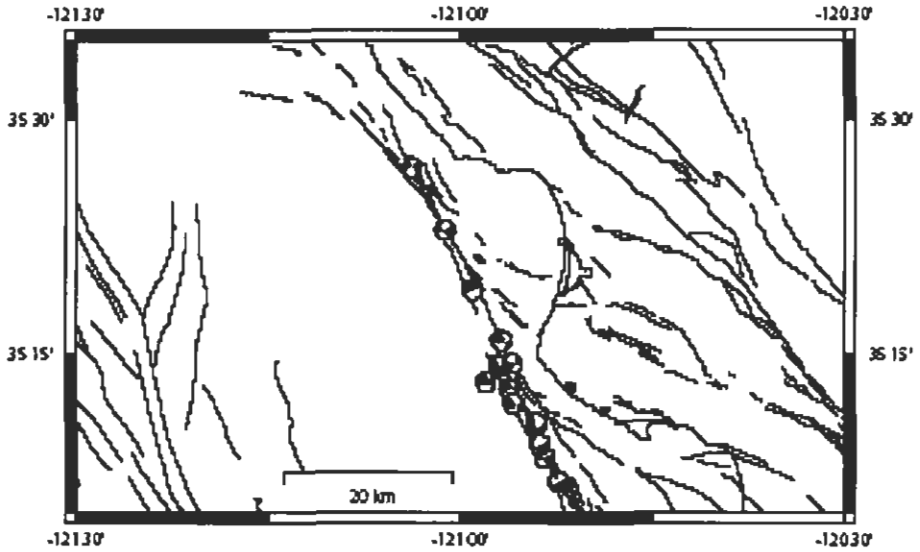
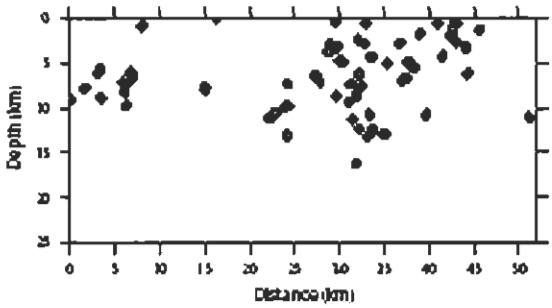


EXHIBIT NO. 12
APPLICATION NO.
A-3-SLO-04-035

A-A' +-3km



B-B' +-22km

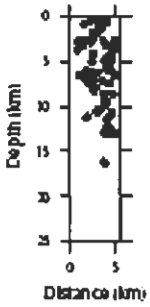


EXHIBIT NO. 13
APPLICATION NO.
A-3-SLO-04-035

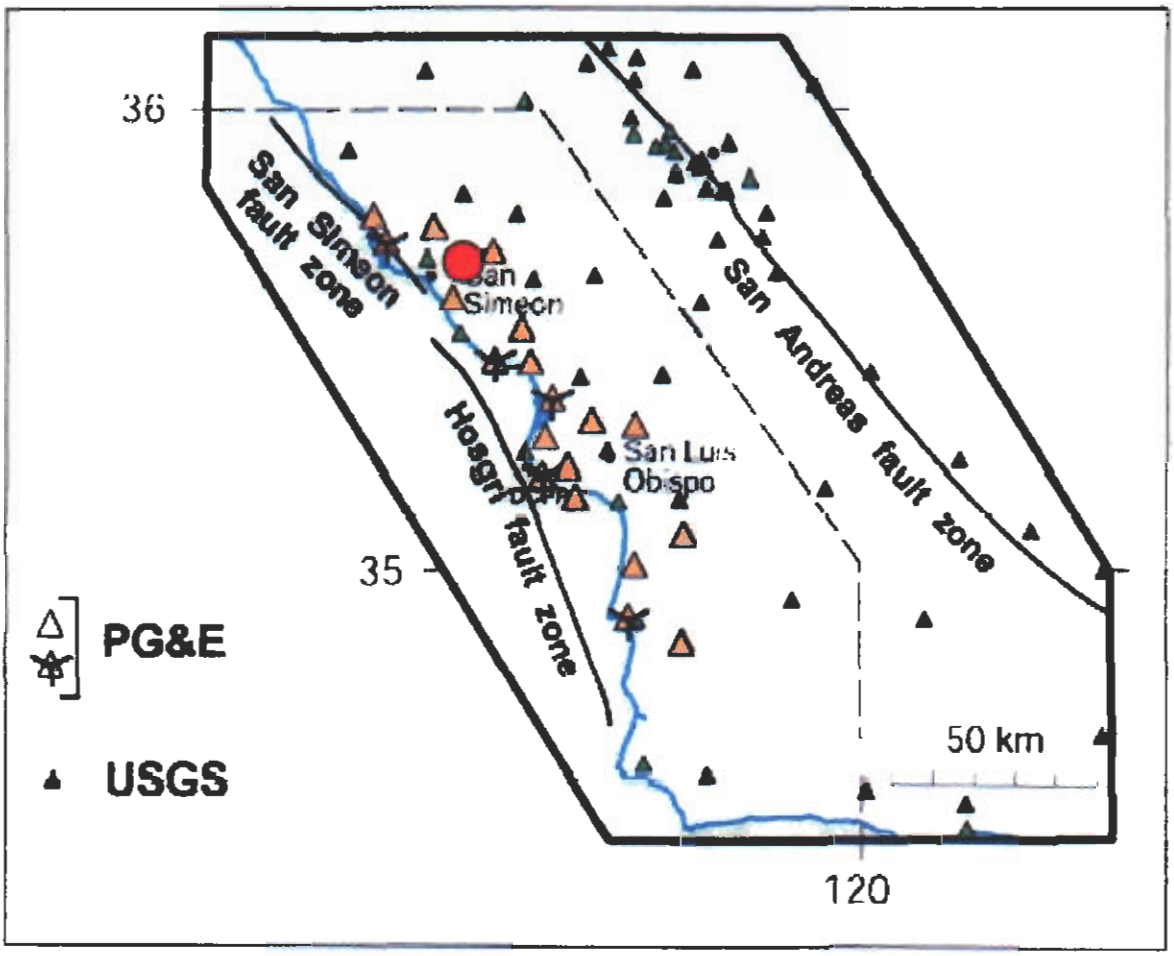


EXHIBIT NO. 14
APPLICATION NO.
A-3-SLO-04-035

L

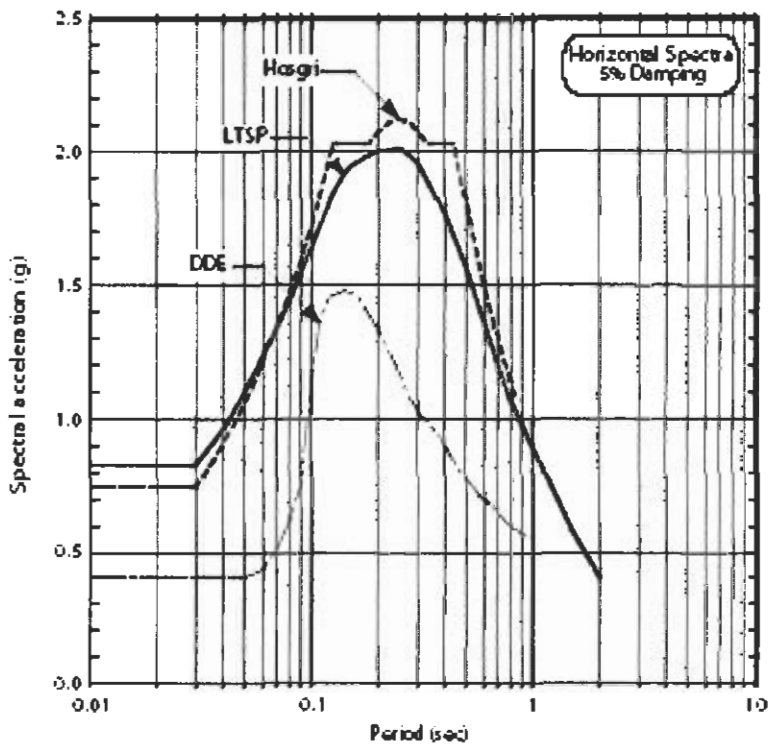


EXHIBIT NO. 15
APPLICATION NO.
A-3-SLO-04-035

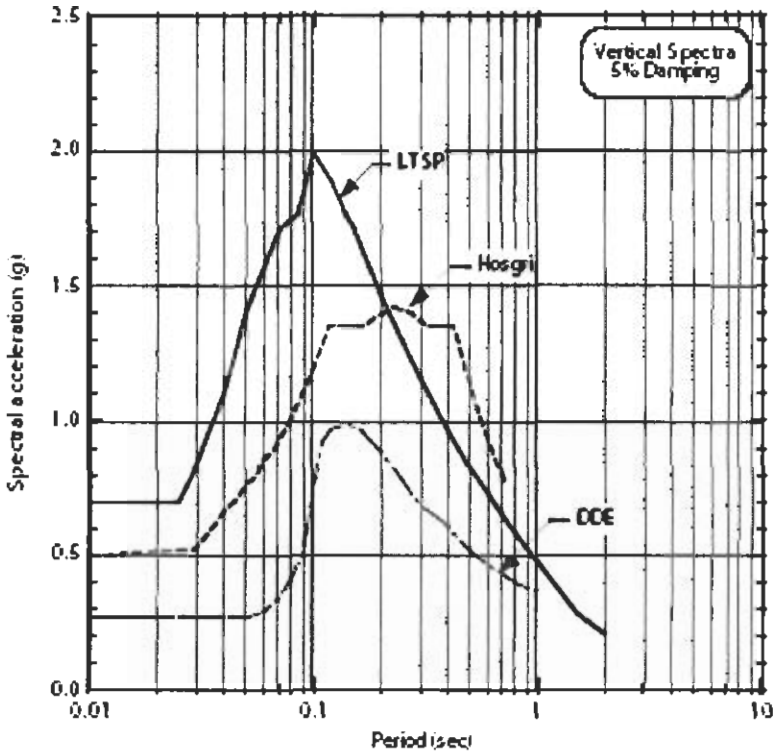


EXHIBIT NO. 16
APPLICATION NO.
A-3-SLO-04-035

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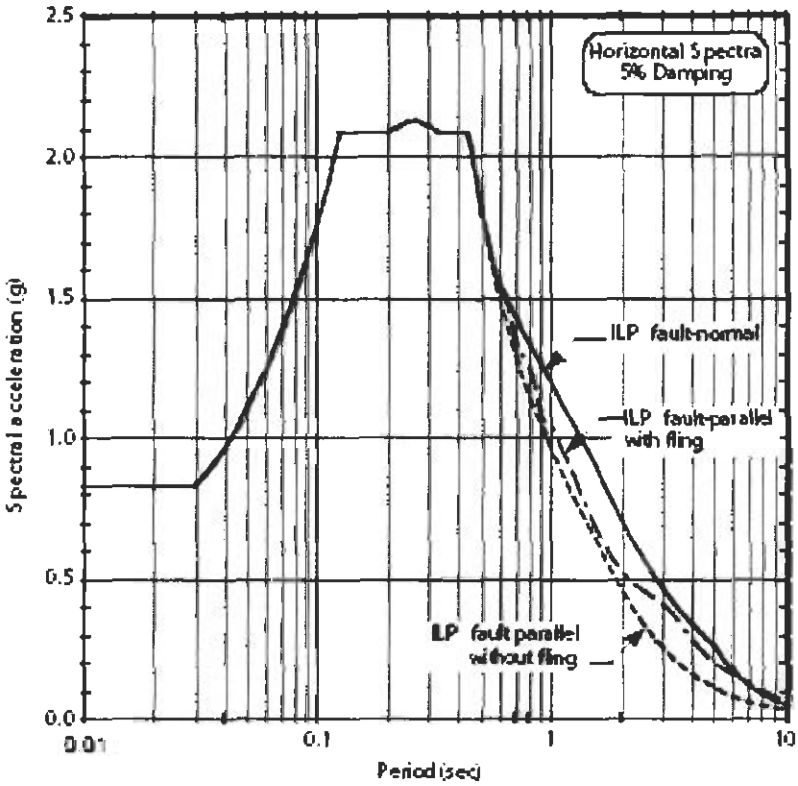


EXHIBIT NO. 17
APPLICATION NO.
A-3-SLO-04-035

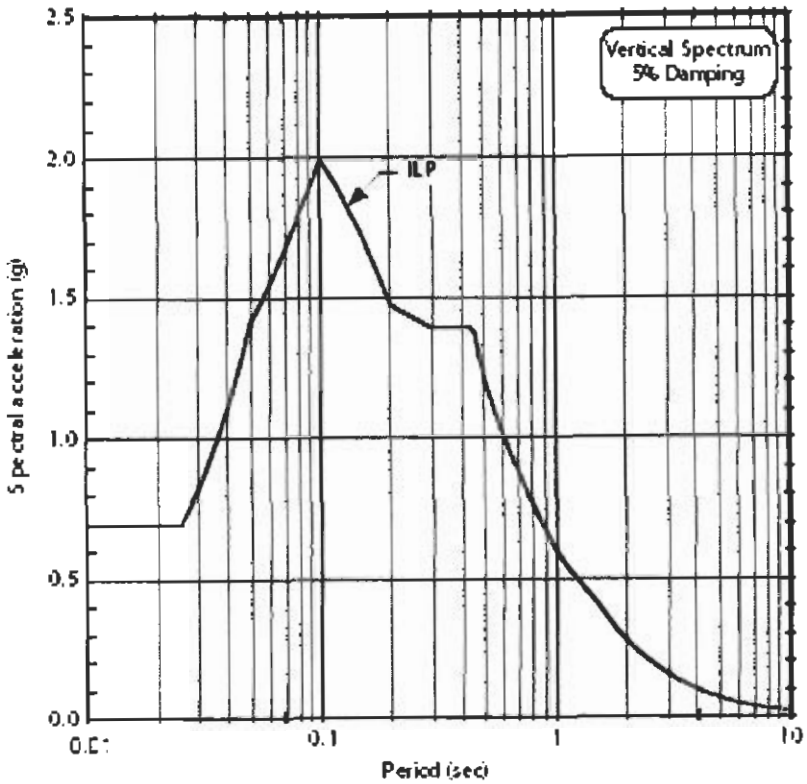
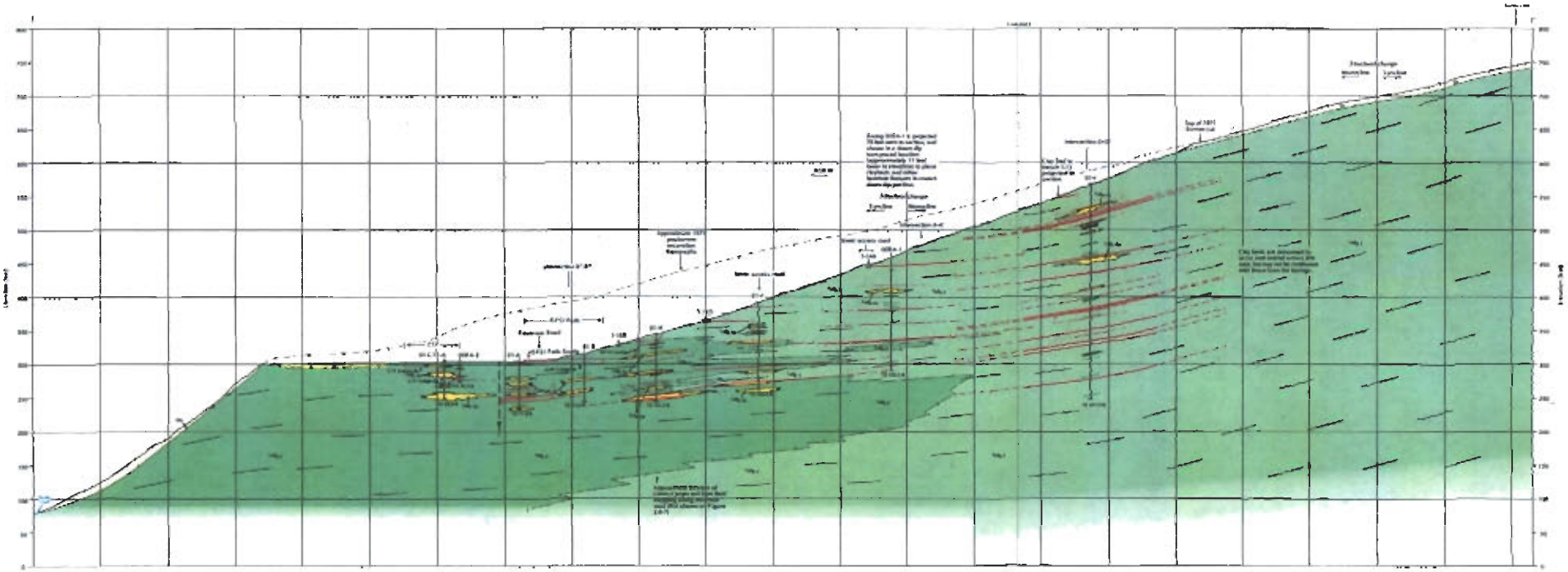


EXHIBIT NO. 18
APPLICATION NO.
A-3-SLO-04-035

P



Notes:

1. Location of cross section shown on Figures 2.6-7 and 2.6-8. Nearby borings are projected to cross section.
2. See Figure 2.6-9 for explanation of geologic units.
3. Horizontal scale = vertical scale

EXHIBIT NO.	19
APPLICATION NO.	
A-3-SLO-04-035	

FSAR UPDATE
DIABLO CANYON ISFSI
FIGURE 2.6-18 CROSS SECTION I-I'

Revision 0 June 2004

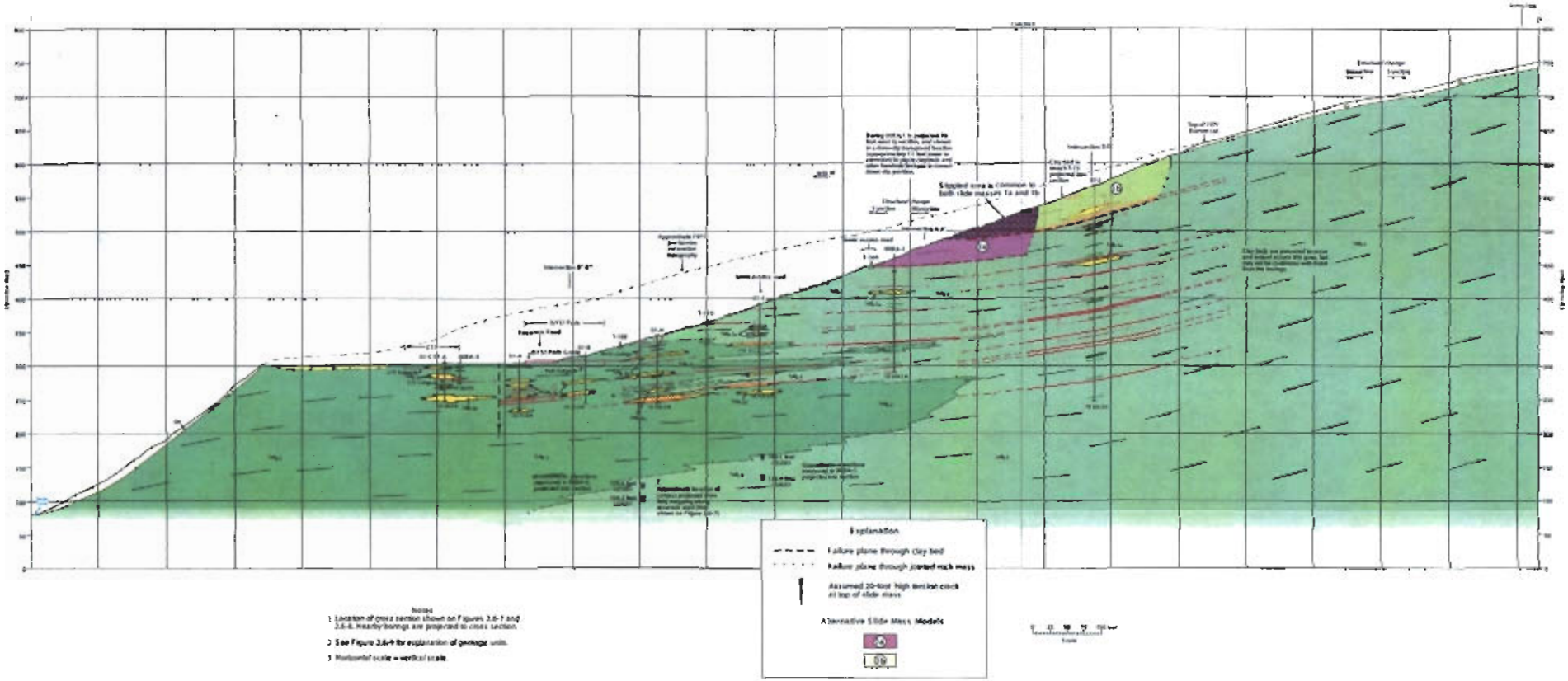


EXHIBIT NO. 20
APPLICATION NO.
A-3-SLO-04-035

FSAR UPDATE
DIABLO CANYON ISFSI
FIGURE 2.6-47 SLIDE MASS MODEL 1

Revision 0 June 2004

5

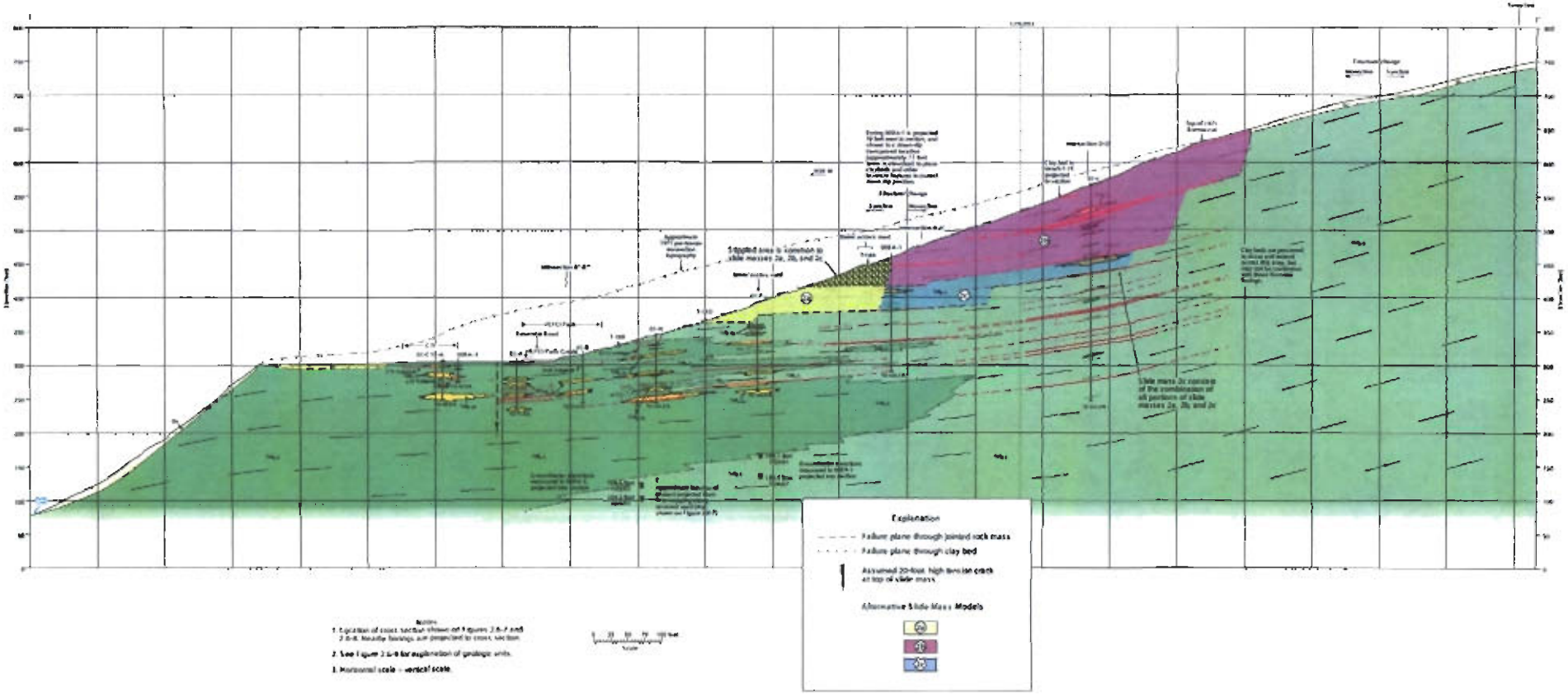


EXHIBIT NO. 21
APPLICATION NO.
A-3-SLO-04-035

FSAR UPDATE
DIABLO CANYON ISFSI
FIGURE 2.6-48 SLIDE MASS MODEL 2

Revision 0 June 2004

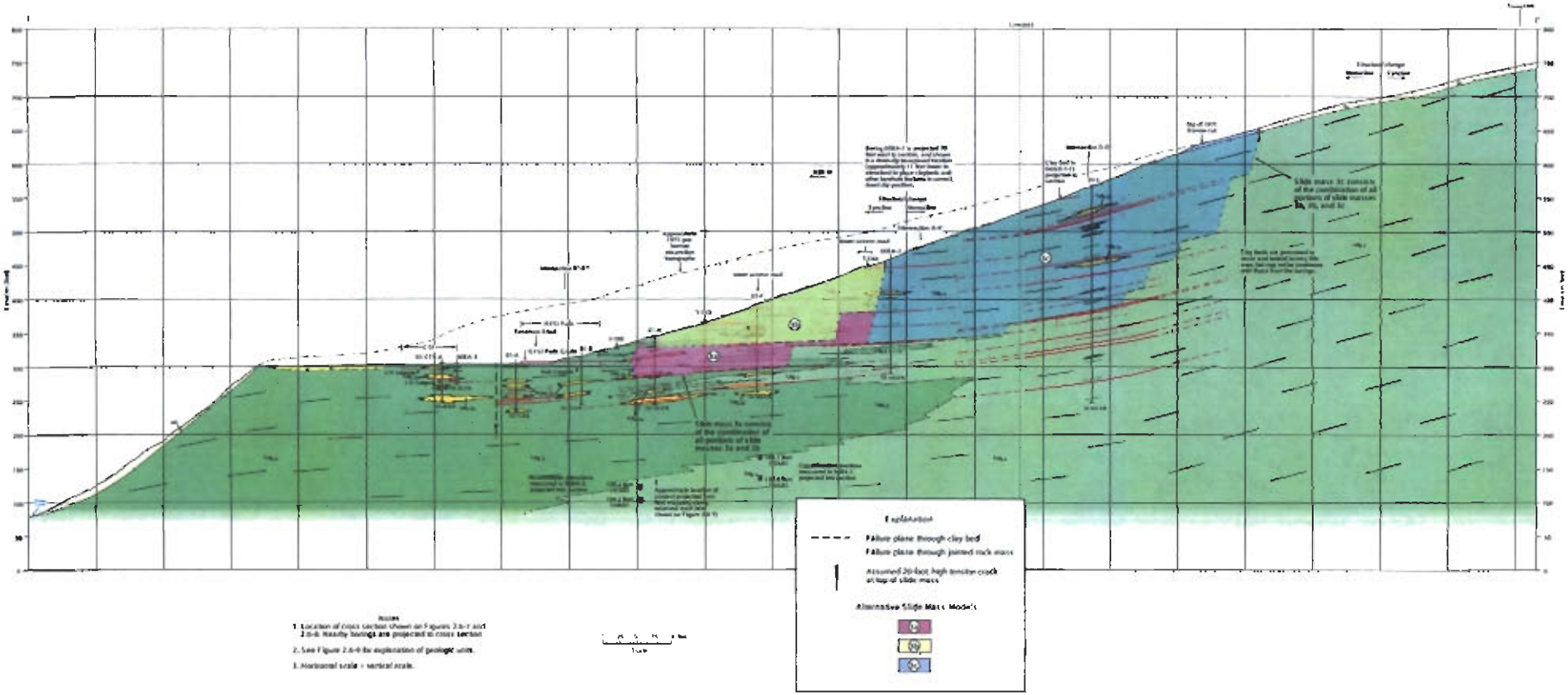
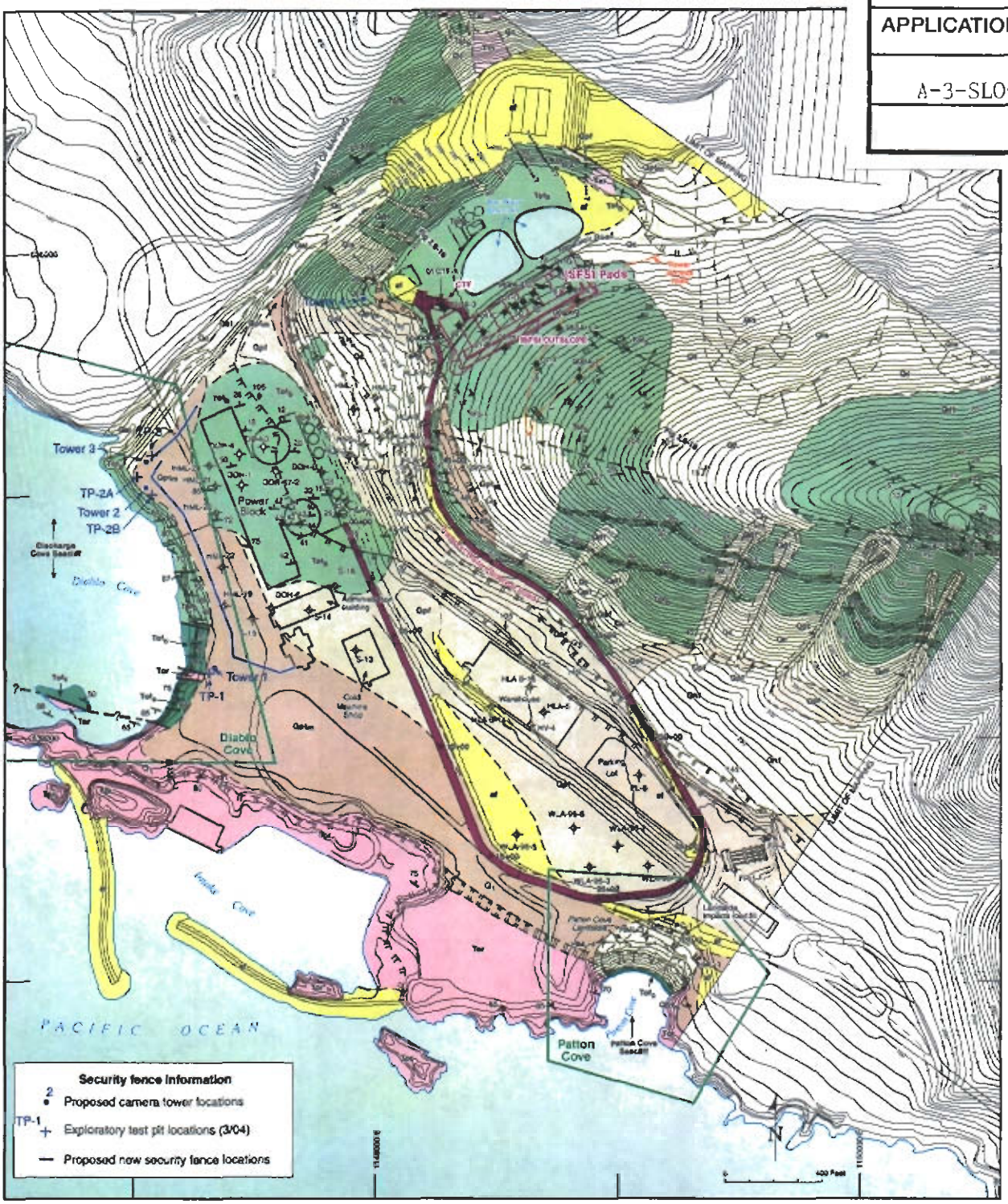


EXHIBIT NO. 22
APPLICATION NO.
A-3-SLO-04-035

FSAR UPDATE
DIABLO CANYON ISFSI
FIGURE 2.6-49 SLIDE MASS MODEL 3

Revision 0 June 2004

EXHIBIT NO. 23
APPLICATION NO.
A-3-SLO-04-035



Explanation

Quaternary

- af — Artificial fill (engineered)
- Qal, Qcf, Qc, Qls, Qrf — Quaternary deposits - alluvium, debris flow, colluvium, landslide, Holocene colluvial fan. NOTE: Only surficial deposits greater than about 5 feet thick shown.
- Qpf — Pleistocene colluvial fan
- Qptm — Pleistocene marine terrace deposit (inferred)

Tertiary

- Tvr — Volcanic rock (middle Miocene), diabase intrusive sills and dikes
- *Obispo Formation (lower and middle Miocene)*
- Tolg — Member Tol, Unit b - dolomite, dolomitic siltstone, dolomitic sandstone, and sandstone, medium to thick bedded. Prominent outcrop
- Tolc — Member Tol, Unit c - shale, claystone and siltstone, thin to medium bedding, extensively sheared.
- Tor — Member Tor - volcanic rock, spilitized and silicified tuff

Geologic contact, solid line where well-defined, dashed where approximate, queried where uncertain.

Fault, dashed where approximate, queried where uncertain

Landslides, arrows indicate direction of movement, hachures define headscarp region

Debris flow path

Axis of syncline, larger arrow shows plunge, dashed where approximate

Axis of anticline, larger arrow shows plunge, dashed where approximate

Axis of monocline, larger arrow shows plunge, dashed where approximate

Buried shoreline, angle of marine terrace wave cut platform; number and elevation indicated

Footprint of 500-kV tower

Strike and dip of fault

Strike and dip of bedding

Overturned bedding

Horizontal bedding

Boring from 1967 power block study

1977 boring DDH-D at power block

Boring from previous HLA and HML studies

Boring, for ISFSI investigations, WLA 1998 to 2001

Boring for ISFSI siting investigations, WLA 1996 to 1998

Transport route, stippled where transport route will be underlain by new engineered fill

NOTE: The base topography for this map is a compilation of four different topographic maps: (1) the 1:2,400-scale Tetra Corporation map based on 1998 aerial photography; (2) the 1996, 1:2,400-scale PG&E Site Plan map; (3) 1970s era, 1:240-scale PG&E topographic/civil maps ("20-scale civil drawings"); and (4) the 2000-2001, 1:600 scale ISFSI Site map. These maps were merged and edited to eliminate map border-conflicts and registered to the California State Coordinate System. Some of the maps listed above were received from PG&E Geosciences Department under letter of transmittal dated October 26, 2001 (PG&E Geosciences, 2001b).

PG&E

DIABLO CANYON SHORELINE RETREAT STUDY

WLA

FIGURE 2
GEOLOGIC MAP OF DCPP AND SEACLIFF EROSION STUDY AREAS

1223-97 DCPP Shoreline

6/7/04

Table 2. Estimated Seacliff Retreat Rates at Diablo Cove Using Multiple Methods.

Method	Sampling Range	Relative Degree of Confidence	Estimated Maximum Retreat (m)	Estimated Uniform Retreat Rate for Diablo Cove (m/yr.)
Topographic Maps	1941 - 1998	LOW	Indeterminate	Indeterminate
LIDAR Surveys	1997-1998	LOW	Indeterminate	Indeterminate
Aerial Photographs	1956-2000	LOW	Indeterminate	Indeterminate
Empirical Correlations to Rock Strength[1]	- -	LOW TO MODERATE	Tor - <0.015/yr. Tofb - <0.03/yr. Tofc – 0.10-0.22/yr.	0.008 to 0.11 [2]
Terrestrial Observations	1969-2004	MODERATE TO HIGH	0.05 to 0.75 [3] 0.5 to 2.0 [4]	0.002 – 0.06

Notes:

(1) Comparison of DCPP rock type to empirical correlations of rock type versus retreat rates by Benumof and Griggs (1999) for seacliffs exposed to open ocean conditions.
(2) Reduction of Benumof and Griggs rates by a factor of 2 to account for wave attenuation in protected cove setting with cove depth to width ratio of about 0.5:1 to 1:1.
(3) Amount of surficial spalling estimated from stick-out length of anchor bolts from rock face in Tofb sandstone adjacent to Discharge Structure for a 34-year period since construction.
(4) Amount of seacliff toe (shoreline angle) retreat/undermining for a 34-year period since construction in Tofb and Tofc bedrock estimated from comparison of pre- and post-construction terrestrial photographs.

Table 3. Estimated Seacliff Retreat Rates at Patton Cove Using Multiple Methods.

Method	Sampling Range	Relative Degree of Confidence	Estimated Maximum Retreat (m)	Estimated Uniform Retreat Rate for Patton Cove (m/yr.)
Topographic Maps	1941 - 1998	LOW	Indeterminate	Indeterminate
LIDAR Surveys	1997-1998	LOW	Indeterminate	Indeterminate
Aerial Photographs	1956-2000	LOW	Indeterminate	Indeterminate
Empirical Correlations to Rock Strength [1]	- -	LOW TO MODERATE	Tor - <0.015 Tofb - <0.03 Tofc – 0.10-0.22	0.004 to 0.06 [2]
Terrestrial Observations	2004	MODERATE	Extrapolate from Diablo Cove (Table 3)	0.001 to 0.03[3]

Notes:

(1) Comparison of DCPP rock type to empirical correlations of rock type versus retreat rates by Benumof and Griggs (1999) for seacliffs exposed to open ocean conditions.
(2) Reduction of Benumof and Griggs rates by a factor of 4 to account for wave attenuation in protected cove setting with cove depth to width ratio of greater than 1:1.
(3) Rate extrapolated from estimated rates from Diablo Cove, but reduced by a factor of 2 to account for the greater depth to width ratio of Patton Cove.

EXHIBIT NO. 24
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A-3-SLO-04-035

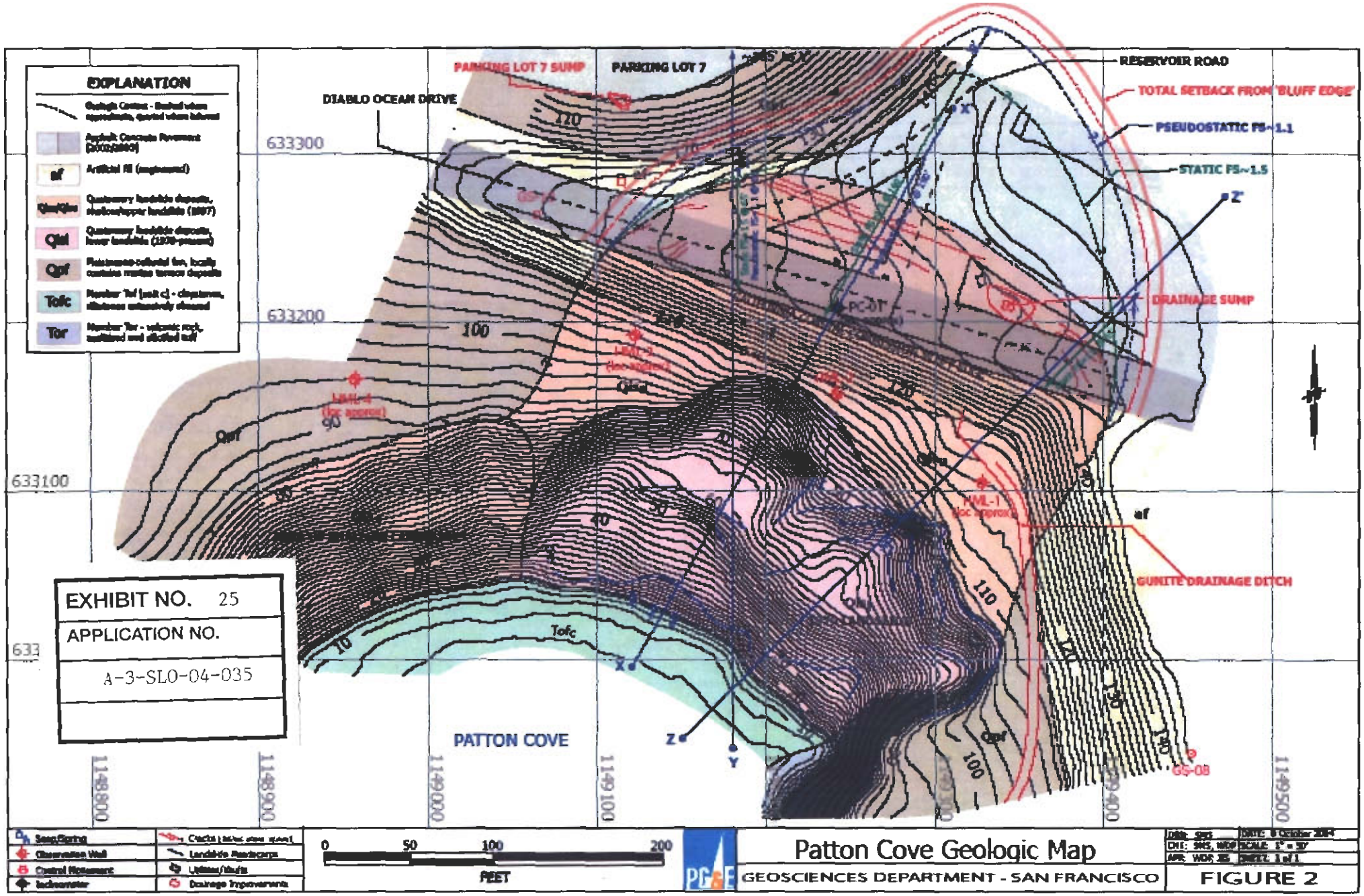

EXHIBIT NO. 25

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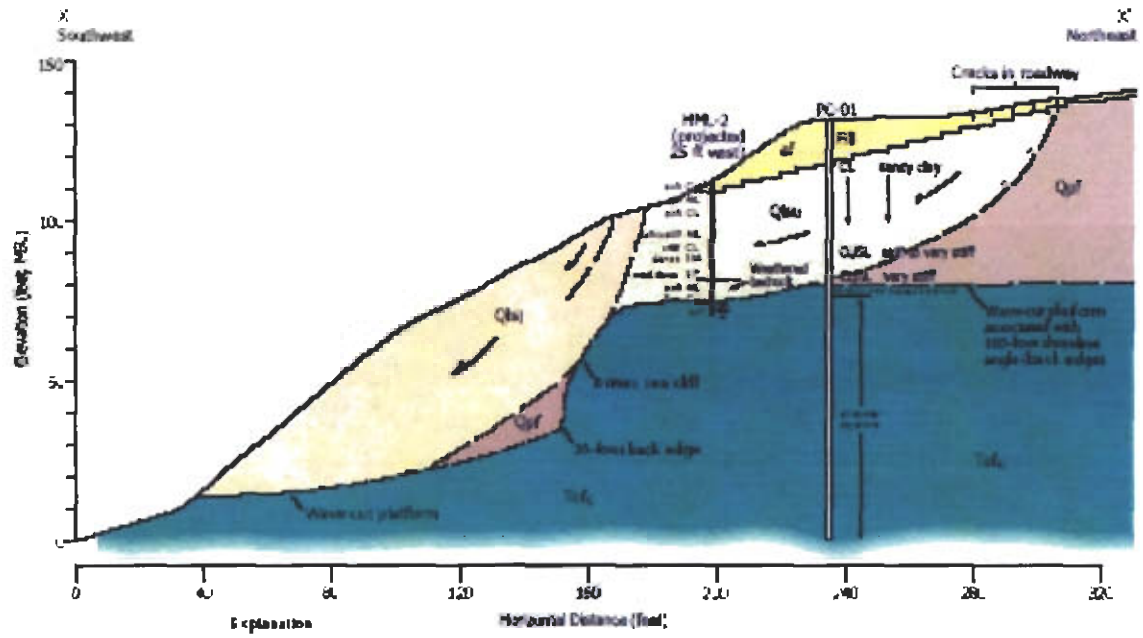

Explanation

Geologic contact, solid where well defined, dashed where approximate, queried where uncertain

Qlau — Quaternary deposits, upper landslide (1997)

Qlaj — Quaternary deposits, lower landslide (1970)

af — Artificial fill (engineered)

Qpf — Pleistocene colluvial fan; locally contains, but is mainly terrace deposits

Tcfu — Member of Tcf Unit c - shale, claystone and siltstone, thin to medium bedding, extensively sheared

Notes: (1) Cross section location shown on Figure 1.
(2) Topography as depicted by HML (1970).

FIGURE 3

Patton Cove Landslide Profile X-X'

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EXHIBIT NO. 26
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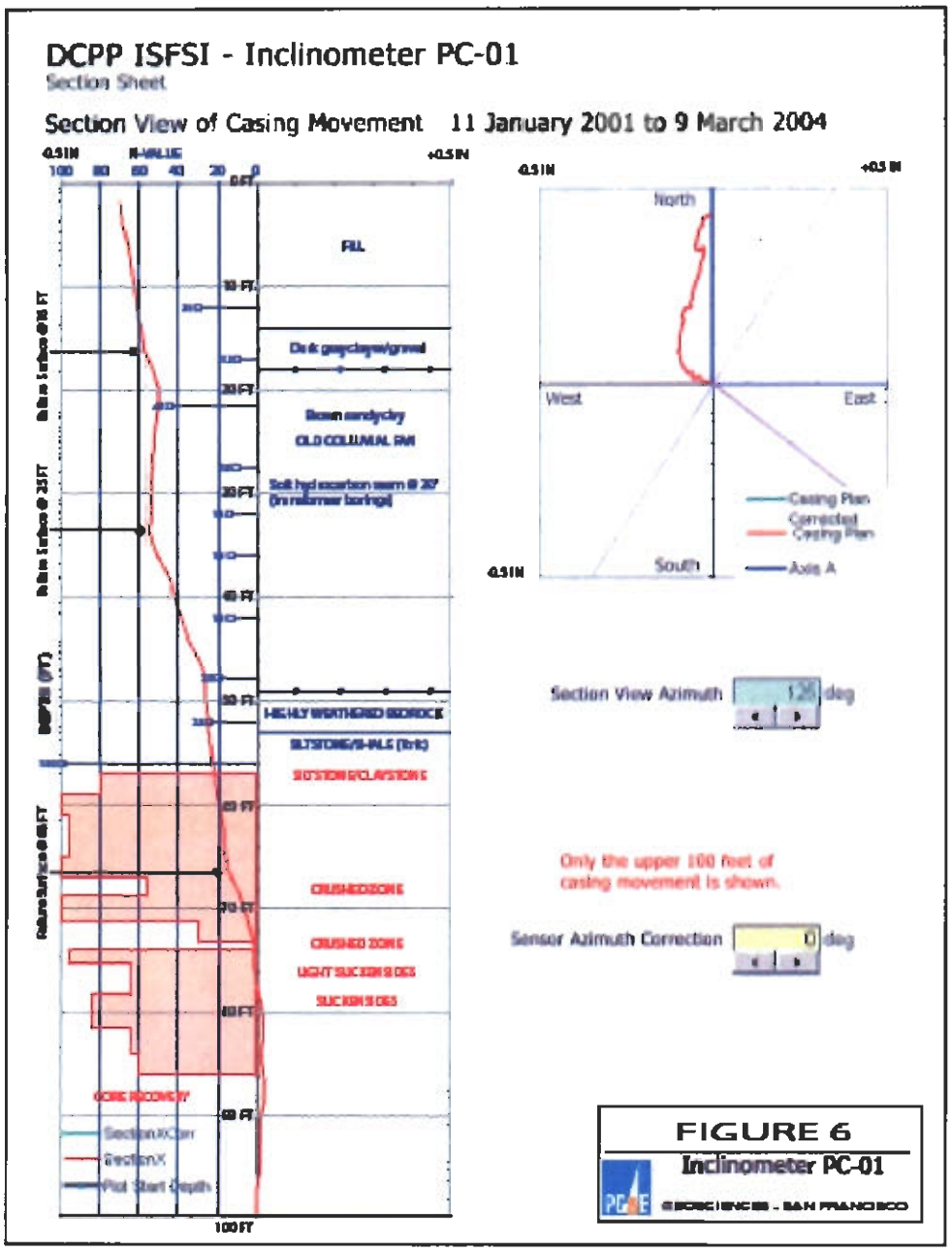

FIGURE 6
Inclinometer PC-01
GEOSCIENCE - SAN FRANCISCO

EXHIBIT NO. 27
APPLICATION NO.
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