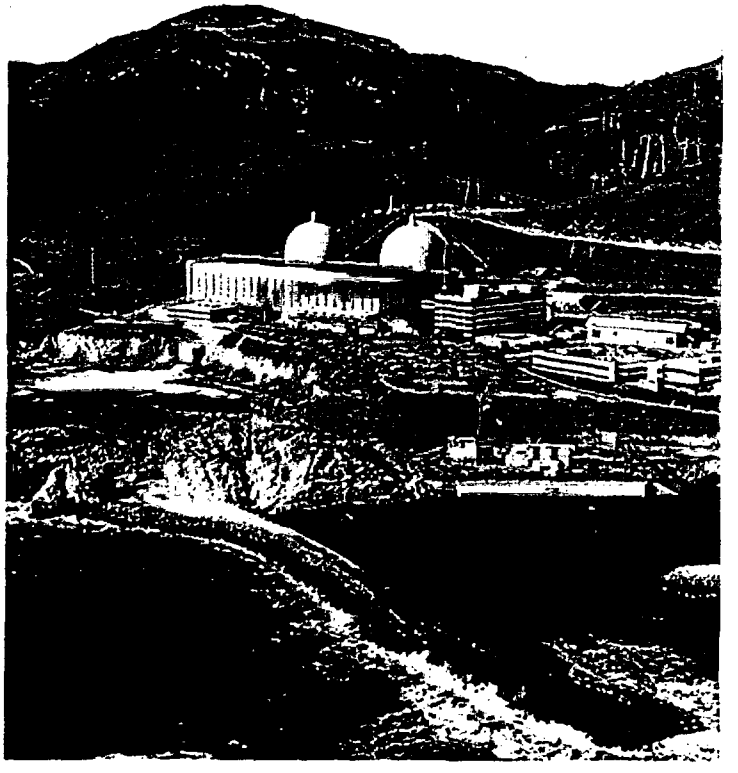
DECOMMISSIONING COST STUDY
for the
DIABLO CANYON POWER PLANT
UNITS 1 AND 2



prepared for

Pacific Gas & Electric Company

prepared by

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TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

SECTION PAGE

TABLES

TABLE OF CONTENTS
(continued)

SECTION PAGE

FIGURES

APPENDICES

REVISION LOG

No.	CRA No.	Date	Item Revised	Reason for Revision
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EXECUTIVE SUMMARY

This study, prepared for Pacific Gas & Electric Company (PG&E) by TLG Services, Inc., evaluates two different decommissioning alternatives for the Diablo Canyon Power Plant (DCPP) following the final cessation of plant operations. The projected costs to decommission the station are estimated at approximately $1,377.2 million and $1,363.0 million for the DECON and SAFSTOR alternatives, respectively. For each of these alternatives, the major cost contributors to the overall decommissioning cost are labor, spent fuel management, radioactive waste disposal, and other removal related activities (e.g. engineering, support equipment). The costs are based on several key assumptions, including regulatory requirements, estimating methodology, contingency requirements, low-level radioactive waste disposal availability, high-level radioactive waste disposal options, and site restoration requirements. A complete discussion of the assumptions used in this estimate is presented in Section 3.

A detailed breakdown of the major cost contributors to the decommissioning cost estimate is reported in Section 6. Cost and schedule summaries are reported at the end of this summary. Schedules of annual expenditures are provided in Section 3, with the detailed activity costs, waste volumes, and removal man-hours provided in the Appendices. Costs are reported in 2002 dollars. Both cost estimates include the continued operation of the Fuel Handling Building's fuel storage pools as an interim wet fuel storage facility until the year 2033 and 2037 (approximately twelve years after each unit's license expiration.) In addition, the estimates include the costs to expand the site Independent Spent Fuel Storage Installation (ISFSI) to accommodate the inventory of spent fuel located on site. This ISFSI is expected to operate until the year 2040.

Alternatives and Regulations

The Nuclear Regulatory Commission (NRC) provided general decommissioning guidance in the rule adopted on June 27, 1988.[1] In this rule the NRC set forth technical and financial criteria for decommissioning licensed nuclear facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC - DECON, SAFSTOR, and ENTOMB.

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[1] U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988.

DECON was defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." [2]

SAFSTOR was defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." [3] Decommissioning is required to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety. The safe-storage period evaluated in this document defers decommissioning 30 years.

ENTOMB was defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property." [4] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.

The 60-year restriction has limited the practicality of the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. However, the NRC is currently re-evaluating this option and the technical requirements and regulatory actions that would be necessary for entombment to become a viable option.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better definition of the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, further describes the methods and procedures that are acceptable to the NRC staff for implementing the requirements

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2 Ibid. Page FR24022, Column 3.

3 Ibid.

4 Ibid. Page FR24023, Column 2.

of the 1996 revised rule that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this estimate follow the general guidance and sequence in the amended regulations.

Methodology

The methodology used to develop the decommissioning cost estimates for DCPP follows the basic approach originally presented in the cost estimating guidelines [5] developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this study reflect site-specific costs and the latest available information about worker productivity in decommissioning. The information obtained from the Shippingport Station Decommissioning Project, completed in 1989, as well as from TLG's involvement in the decommissioning planning and engineering for the Shoreham, Yankee Rowe, Trojan, Rancho Seco, Pathfinder, Big Rock Point, Maine Yankee, and Cintichem reactor facilities, is reflected within this estimate.

An activity duration critical path is used to determine the total decommissioning program schedule required for calculating the carrying costs. These costs include program management, administration, field engineering, equipment rental, quality assurance, and security. Such a systematic approach for assembling decommissioning estimates has ensured a high degree of confidence in the reliability of the resulting costs.

Contingency

Consistent with industry practice, contingencies are applied to the decontamination and dismantling costs developed as, "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."[6] The cost elements in this estimate are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this estimate, does not

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5 T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

6 Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239.

account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the units.

The use and role of contingency within decommissioning estimates is not a safety factor issue. Safety factors provide additional security and address situations that may never occur. Contingency funds, by contrast, are expected to be fully expended throughout the program. Inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level radioactive waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Disposal Act" in 1980, and its Amendments of 1985 [7], the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. Consequently, low-level radioactive waste generated in the decontamination and dismantling of PG&E's nuclear generating units is destined for the Southwest Compact's future disposal site.

For purposes of constructing the decommissioning cost estimates, an assumed unit burial rate of $5.05 per pound was used to calculate the cost for disposal of low-level radioactive waste generated in the decontamination and dismantling of DCPP. This rate is derived from the disposal rates charged at the Barnwell low-level waste disposal facility for non-Atlantic compact generators.

High-Level Waste

Congress passed the "Nuclear Waste Policy Act" [8] in 1982, assigning the responsibility for disposal of spent nuclear fuel created by the commercial nuclear generating plants to the DOE. This legislation also created a Nuclear Waste Fund to cover the cost of the program, which is funded by the sale of electricity from nuclear reactors, and an estimated equivalent value of assemblies irradiated prior to April 1983. The Nuclear Waste Policy Act, along with the individual disposal contracts with utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

After several delays, DOE estimates that the geologic repository will not be operational until sometime between the years 2010 and 2015. For the basis of this

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7 "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1/15/86.

8 "Nuclear Waste Policy Act of 1982 and Amendments," U.S. Department of Energy's Office of Civilian Radioactive Management, 1982.

cost study, PG&E has assumed that the high-level waste repository or some interim storage facility will accept spent fuel from DCPP starting in the year 2018. The backlog of spent fuel in the national inventory, and slow progress in the development of a waste transportation system, make it necessary to include spent fuel storage in the cost and schedule of commercial reactor decommissioning.

Although the cost to dispose of spent fuel assemblies generated during plant operations currently is not considered a decommissioning expense, the presence of those assemblies on site does have a bearing on the cost to decommission. For estimating purposes, a spent fuel storage scenario was developed for DCPP. This scenario assumes that PG&E will have constructed an ISFSI at the plant site to support continued plant operations. It also assumes that the Fuel Handling Buildings at DCPP will be operational for at least 12 years after the cessation of each unit's operations, regardless of the decommissioning mode selected (so as to allow for sufficient cooling for passive storage). For both decommissioning alternatives, the spent fuel assemblies in the storage pools at the cessation of plant operations will be relocated to the ISFSI for storage until such time that a transfer to a DOE or interim storage facility can be completed. Costs are included within the estimates to expand the ISFSI to accommodate the pool inventories at shutdown. By relocating the fuel to the ISFSI, PG&E can secure the wet storage pools and proceed with decommissioning the DCPP. The current PG&E spent fuel storage plan projects that spent fuel will be at Diablo Canyon until the year 2040 for both the DECON and SAFSTOR alternatives.

Site Restoration

The efficient removal of the contaminated materials at the site will result in substantial damage to many of the site structures. Blasting, coring, drilling and the other decontamination activities will substantially damage power block structures, potentially weakening the footings and structural supports. Prompt demolition after license termination is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient and less costly than if the process is deferred. Experience at shutdown generating stations has shown that plant facilities quickly degrade without continual maintenance, adding additional expense and creating potential hazards to the public, as well as to the demolition work force. Consequently, this study assumes that site structures will be removed to a nominal depth of three feet below the local grade level. The site will then be graded and stabilized.

DIABLO CANYON UNITS 1 AND 2

COST AND SCHEDULE ESTIMATE SUMMARY

	Cost 02$ (thousand)	Schedule (years)
DECON (Prompt Removal/Dismantling)		
Unit 1	575,843.6	19.2
Unit 2 & Common	801,321.5	16.1
STATION TOTAL	**1,377,165.1** (1)	**19.8** (2)
SAFSTOR (Mothball with Delayed Dismantling)		
Unit 1		
Preparations	56,564.8	1.5
31.62 year Maintenance	188,024.0	31.6
Delayed Dismantling	338,862.0	7.8
Subtotal	**583,450.8**	**40.9**
Unit 2 & Common		
Preparations	58,643.8	1.5
29.3 year Maintenance	162,632.4	29.3
Delayed Dismantling	558,266.6	6.5
Subtotal	**779,542.8**	**37.3**
STATION TOTAL	**1,362,993.6**	**40.9** (3)

(1) Columns may not add due to rounding.
(2) Time elapsed from the cessation of operations at Unit 1 to the completion of the off-site transfer of spent fuel and decommissioning of the ISFSI.
(3) Time elapsed from the cessation of operations at Unit 1 to the completion of site restoration at Unit 2.

1. INTRODUCTION

This analysis is designed to provide Pacific Gas & Electric (PG&E) with sufficient information to prepare financial planning documents required by the Nuclear Regulatory Commission (NRC). It is not a detailed engineering document, but a cost estimate prepared in advance of the detailed engineering preparations required to carry out the decommissioning of Units 1 and 2 of the Diablo Canyon Power Plant (DCPP).

1.1 OBJECTIVE OF STUDY

The objective of this study is to prepare an estimate of the cost, schedule, occupational exposure, and waste volume generated to decommission the DCPP, including all common and supporting facilities. The study considers the integration of two-unit dismantling, as discussed below.

Unit 1 began commercial operation in May 1985, with Unit 2 following in March of 1986. For the purposes of this study, the shutdown dates were taken as 36 years after the date commercial operation, or September 2021 for Unit 1, and 39 years after the date commercial operation for Unit 2, or April 2025. This time frame was used as input for scheduling the decommissioning.

1.2 SITE DESCRIPTION

DCPP is located on the central California coast in San Luis Obispo County, approximately 12 miles west southwest of the City of San Luis Obispo. The plant, comprised of two nuclear units, is located on a 750-acre site adjacent to the Pacific Ocean, roughly equidistant from San Francisco and Los Angeles.

The Nuclear Steam Supply System (NSSS) consists of a pressurized water reactor and a four-loop Reactor Coolant System. The systems were supplied by the Westinghouse Electric Corporation. Units 1 and 2 each have a current license rating of 3411 Mwt, with corresponding net dependable capability electrical ratings of 1087 megawatts (electric), with the reactors at rated power.

The Reactor Coolant System is comprised of the reactor vessel and four heat transfer loops, each containing a vertical U-tube type steam generator, and a single-stage centrifugal reactor coolant pump. In addition, the system includes an electrically heated pressurizer, a pressurizer relief tank, and

interconnected piping. The system is housed within a "containment structure," a seismic Category I reinforced-concrete dry structure. It consists of an upright cylinder topped with a hemispherical dome, supported on a reinforced concrete foundation mat, which is keyed into the bedrock. A welded steel liner plate anchored to the inside face of the containment serves as a leak-tight membrane. The liner on top of the foundation mat is protected by a two-foot thick concrete fill mat, which supports the containment internals and forms the floor of the containment. The lower portion of the containment cylindrical wall has additional embedded wide flange steel beams between elevations 88 ft. 2 in. and 108 ft. 2 in. (mean sea level).

Heat produced in the reactor is converted to electrical energy by the Steam and Power Conversion Systems. A turbine-generator system converts the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. The plant's turbine-generators are each tandem compound, four element units. They consist of one high-pressure double-flow and three low-pressure double-flow elements driving a direct-coupled generator at 1800 rpm. The turbines are operated in a closed feedwater cycle these condenses the steam; the heated feedwater is returned to the steam generators. Heat rejected in the main condensers is removed by the Circulating Water System (CWS).

The circulating water system provides the heat sink required for removal of waste heat in the power plant's thermal cycle. The system has the principal function of removing heat by absorbing this energy in the main condenser. Condenser circulating water is water from the Pacific Ocean. Each unit is served by two circulating water pumps at the intake structure. From this structure seawater is pumped through two circulating water conduits to the condenser inlet water boxes. The water is returned to the ocean at Diablo Cove through an outfall at the water's edge.

1.3 REGULATORY GUIDANCE

The NRC provided decommissioning guidance in the rule "General Requirements for Decommissioning Nuclear Facilities," (Ref. 1) published and adopted on June 27, 1988. This rule amended NRC regulations to set forth technical and financial criteria for decommissioning licensed nuclear facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely

manner and that adequate licensee funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," (Ref. 2) which provided guidance to the licensees of nuclear facilities on methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule amendments.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR and ENTOMB. It also placed limits on the time allowed to complete the decommissioning process. For SAFSTOR, the process is restricted in overall duration to 60 years unless it can be shown that a longer duration is necessary to protect public health and safety. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. Consequently, with the new restrictions, the SAFSTOR and ENTOMB options are no longer decommissioning alternatives in themselves, as neither terminates the license for the site. At the conclusion of a 60-year dormancy period (or longer for ENTOMB if the NRC approves such a case), the site would still require significant remediation to meet the definition of unrestricted release and license termination.

In 1996 the NRC published revisions to the general requirements for decommissioning nuclear power plants (Ref. 3). When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the operating license life. Since that time, several licensees have permanently and prematurely ceased operations without having submitted a decommissioning plan. In addition, these licensees requested exemptions from certain operating requirements as being unnecessary once the reactor is defueled. Each case has been handled individually without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The new amendments allow for greater public participation and better definition of the transition process from operations to decommissioning.

Under the revised regulations, licensees would submit written certification to the NRC within 30 days after the decision to cease operations. Certification

would also be required once the fuel were permanently removed from the reactor vessel. Submittal of these notices would entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee would be required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee would be required to submit an application to the NRC to terminate the license, along with a license termination plan.

1.3.1 Nuclear Waste Policy Act

Congress passed the Nuclear Waste Policy Act in 1982 (Ref. 4), assigning the responsibility for disposal of spent nuclear fuel from the commercial generating plants to the Department of Energy (DOE). Two permanent disposal facilities were envisioned, as well as an interim facility. To recover the cost of permanent spent fuel disposal, this legislation created a Nuclear Waste Fund through which money was to be collected from the consumers of the electricity generated by commercial nuclear power plants. The date targeted for startup of the federal Waste Management System was 1998.

After pursuing a national site selection process, the Act was amended in 1987 to designate Yucca Mountain, Nevada, as the only site to be evaluated for geologic disposal of high-level waste. Also in 1987, DOE announced a five-year delay in the opening date for the repository, from 1998 to 2003. Two years later, in 1989, an additional 7-year delay was announced, primarily due to problems in obtaining the required permits from the state of Nevada to perform the required characterization of the site. DOE has projected additional delays as a result of proposed Congressional reductions in appropriations for the program.

Utilities have responded to this impasse by initiating legal action and constructing supplemental storage as a means of maintaining necessary operating margins. On November 14, 1997, the U.S. Court of Appeals for the District of Columbia Circuit issued a decision in Northern States Power Company, et al., v. U.S. Department of Energy. In the decision, the Court reaffirmed its ruling in Indiana Michigan Power Company, et al v. U.S. Department of Energy that the DOE has an unconditional obligation to begin disposal of the utilities' spent nuclear

fuel by January 31, 1998. Since the agency was not in default at the time the Northern States Power decision was issued, the court declined to prescribe "remedies" in the likely event the DOE failed to uphold its obligation. More recently, the U.S. Court of Federal Claims has ruled in favor of Yankee Atomic Power Company in its damage claim. However, even with the ruling, the DOE's position has remained unchanged. The agency continues to maintain that its delayed performance is unavoidable because it does not have an operational repository and does not have authority to provide storage in the interim. Consequently, the DOE has no plans to accept any spent fuel from commercial U.S. reactors before the year 2010.

For purposes of constructing the decommissioning cost estimate, DOE is assumed to begin receiving spent fuel from the DCPP site in the year 2018. It is estimated that the DCPP spent fuel would be completely transferred to DOE by the end of year 2040. These schedules and dates are based upon information provided by PG&E and DOE's capacity and turnover schedule (Ref. 5).

1.3.2 Low-Level Radioactive Waste Policy and Amendments

Congress passed the "Low-Level Radioactive Disposal Act" in 1980, declaring the states as being ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. The federal law encouraged the formation of regional groups or compacts to implement this objective safely, efficiently and economically, and set a target date of 1986. With little progress, the "Amendments Act" of 1985 (Ref. 6) extended the target, with specific milestones and stiff sanctions for non-compliance.

The low-level radioactive waste generated in the decontamination and dismantling of DCPP is destined for the Southwest Compact's future disposal facility. For purposes of constructing the decommissioning cost estimates, an assumed unit burial rate of $5.05 per pound was used to calculate the cost for disposal of low-level radioactive waste generated in the decontamination and dismantling of DCPP. This rate is derived from the disposal rates charged at the Barnwell low-level waste disposal facility for non-Atlantic compact generators.

1.3.3 Radiological Criteria for License Termination

In 1997, 10 CFR 20, Subpart E, "Radiological Criteria for License Termination," (Ref. 7) was published. This subpart provided radiological criteria for releasing a facility for unrestricted use. The regulation provides that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA).

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). An additional limit of 4 millirem per year, as defined in 40 CFR Part 141.16, is applied to drinking water.

The Congress has prohibited the EPA from spending funds to enforce cleanup requirements at sites under the jurisdiction of the NRC. However, the mandate is not legally binding and the possibility exists that a site, once released from its NRC license, could be subject to EPA regulation.

2. DECOMMISSIONING ALTERNATIVES

Cost studies were developed to decommission DCPP under two of the NRC-approved decommissioning alternatives: DECON and SAFSTOR. The duration of dormancy (30 years) selected for the SAFSTOR alternative is within the maximum allowable interval (60 years) between cessation of operations and termination of the site license(s). Although the alternatives differ with respect to technique, process, cost, and schedule, the two alternatives attain the same result: removal of all regulated radioactive material from the site and ultimate release of the site for unrestricted and/or alternative use.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, these activity descriptions provide a basis not only for estimating, but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to a disposal facility.

The conceptual approach that the NRC has chosen in its amended regulations is to divide decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations, i.e., power production, to facility de-activation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee would then be prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. TLG's methodology

divides the decommissioning project into periods, based upon major milestones in the project. The NRC's initial phase corresponds to TLG's Period 1, with phases two and three as subsets of Period 2. TLG's Period 3, Site Restoration, and Post-Period 3, ISFSI Operations and Decommissioning, have no corresponding NRC phases. However, the NRC does require licensees to have a funding and high-level waste management plan under 10 CFR §50.54(bb).

2.1.1 Period 1 - Preparations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. The organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources, as required. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications appurtenant to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

Engineering and Planning

The PSDAR, required before or within two years of the notice to cease operations, provides a description and timetable of the licensee's planned decommissioning activities and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local hearing to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing Greater-than-Class C waste (GTCC), as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,

- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license.

Consequently, in conjunction with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, work packages, and procedures must be assembled in support of the proposed decontamination and dismantling activities.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity.

The NRC recognizes that the existing operational technical specifications will require review and modifications to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities must also be considered. A licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than bounded by previously issued environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

Much of the work in preparing the PSDAR is also relevant to the development of the detailed engineering plans and procedures. This work includes, but is not limited to:

- Site preparation plans for the proposed decommissioning activities;
- Detailed procedures and removal sequences for plant systems and components;
- Evaluation of the disposition alternatives for the reactor vessel and its internals;
- Plans for decontamination of structures and systems;

- Design/procurement and testing of tooling and equipment;
- Identification/selection of specialty contractors;
- Procedures for removing and disposing of radioactive materials; and
- Sequential planning of activities to minimize conflicts with simultaneous tasks.

Site Preparations

Following final plant shutdown and in preparation for actual decommissioning activities, the following activities are initiated.

- Prepare site support and storage facilities, as required.
- Perform site characterization study to determine extent of site contamination.
- Isolate spent fuel storage services and fuel handling systems located in the Fuel Handling Buildings from the power block such that decommissioning operations can commence on the balance of the plant. This activity may be carried out by existing plant personnel in accordance with existing operating technical specifications. Decommissioning operations are assumed to be scheduled around the Fuel Handling Buildings to the greatest extent possible such that the overall project schedule is optimized. Current dry storage cask designs are licensed for spent fuel with a core discharge decay time averaging approximately five years or longer. Considering the longer fuel cycles and higher fuel burnup, the fuel at DCPP may require up to twelve years of active cooling before being relocated to dry storage. Therefore, decommissioning operations for the Fuel Handling Buildings cannot be expected to begin prior to twelve years after the cessation of plant operations. As spent fuel decays to the point that it meets the heat load criteria of the dry storage casks, it will be transferred either to the on-site ISFSI or to the DOE high-level waste repository. It is assumed that all fuel is transferred from the Fuel Handling Buildings within approximately 12 years after cessation of operations at each unit.
- Clean all plant areas of loose contamination and process all liquid and solid wastes.

- Conduct radiation surveys of work areas, major components (including the reactor vessel and its internals), sampling of internal piping contamination levels, and primary shield cores.

- Correlate survey data and normalize for development of packaging and transportation procedures.

- Determine transport and disposal container requirements for activated materials and/or hazardous materials, including shielding and stabilization. Fabricate or procure such containers.

- Develop procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste including Dry Active Waste (DAW), resins, filter media, metallic and non-metallic components generated in decommissioning, site security and emergency programs, and industrial safety.

Following submittal of the PSDAR and certification of permanent fuel removal from the reactor vessel, the licensee may commence major decommissioning activities. Full access to the decommissioning fund will require the preparation of a detailed site-specific cost estimate for submittal to the NRC. In addition, a license termination plan must be prepared at least two years prior to the license termination date.

2.1.2 Period 2 - Decommissioning Operations & License Termination

For the DECON alternative, significant decommissioning activities involve the following steps:

- Construct temporary facilities and modify existing storage facilities to support the dismantling activities. These may include additional changing rooms and contaminated laundry facilities for increased work force, establishment of laydown areas to facilitate equipment removal and preparation for off-site transfer, upgrading roads to facilitate hauling and transportation, and modifications to the Reactor Building to facilitate access of large/heavy equipment.

- Design and fabricate shielding and contamination control envelopes in support of removal and transportation activities; specify/procure specialty tooling and remotely operated equipment. Modify the refueling canal to support segmentation activities and prepare

rigging for segmentation and extraction of heavy components, including the reactor vessel and its internals.

- Procure required shipping canisters, cask liners, and Industrial Packages (IPs) from suppliers.

- Conduct decontamination of components and piping systems as required to control (minimize) worker exposure. Remove, package, and dispose of all piping and components that are no longer essential to support decommissioning operations.

- Remove control rod drive housings and the head service structure from reactor vessel head and package for controlled disposal.

- Segment reactor vessel closure head and vessel flange for shipment in cask liners. Load overpack liners into shielded casks or place in shielded vans for transport.

- Segment upper internals assembly, including upper support assembly, deep beam weldment, support columns, and upper core plates; package segments in shielded casks. These operations are performed remotely by cutting equipment located underwater in the refueling canal. Package and dispose of items that meet §61 Class C criteria or less.

- Disassemble/segment remaining reactor internals in shielded casks. These internals include core barrel, core baffle/former assembly, thermal shields, lower core plate, and lower core support assembly. The operations are also conducted under water using remotely operated tooling and contamination controls. Package and dispose of items that meet §61 Class C criteria or less.

- Package §61 GTCC components into fuel bundle containers for handling and storage along with the spent fuel assemblies. Transfer fuel bundle containers to the Fuel Handling Buildings or suitable storage location.

- Segment/section the reactor vessel, placing segments into shielded containers. The operation is performed remotely in air using a contamination control envelope. Sections are placed in containers stored under water (for example in an isolated area of the refueling

canal) using a remote or shielded crane. Transport the containers using shielded truck casks.

- Remove the reactor coolant piping and pumps after the vessel water level drops below the elevation of the inlet and outlet nozzles during vessel segmentation. Package the piping in IPs; the reactor coolant pumps are sealed with steel plate so as to serve as their own containers. Ship piping and pumps for controlled disposal.

- Remove systems and associated components as they become non-essential to the vessel removal operation, related decommissioning activities or worker health and safety (e.g., waste collection and processing systems, electrical and ventilation systems, etc.).

- Remove activated concrete biological shield and accessible contaminated concrete (excluding steam generator and pressurizer cubicles). If dictated by the steam generator and pressurizer removal scenarios, remove those portions of the associated cubicles necessary for access and component extraction.

- Remove steam generators and pressurizer for shipment and controlled disposal. Remove steam domes from generators as the diameter exceeds the clearance requirements dictated by rail transport. Weld an end-cap over the exposed tube bundle on the lower shell units. Decontaminate exterior surfaces, as required, and seal-weld openings (nozzles, inspection hatches, and other penetrations). These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized. Add steel shields to those external areas of the steam generator lower shell units to meet transportation limits and regulations. Segment steam generator steam domes to meet individual package restrictions and transport dome segments off site for recycle.

A License Termination Plan is required to be prepared at least two years prior to the anticipated date of license termination. Submitted as a supplement to the FSAR or equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan

available for public comment, and schedule a local hearing. Plan approval will be subject to any conditions and limitations as deemed appropriate by the NRC. The licensee may then commence with the final remediation of site facilities and services, including:

- Remove steel liners from the refueling canal and containment, including any contaminated canal concrete, and route for controlled disposition.

- Remove contaminated equipment and material from the Auxiliary Building. Remediate until radiation surveys indicate that the structure can be released for unrestricted access.

- Remove contaminated equipment and material from the Fuel Handling Buildings following the transfer of all residual spent fuel to either an onsite storage facility or a federal facility off site. Remediate Fuel Handling Building areas until radiation surveys indicate that the structure can be released for unrestricted access.

- Decontaminate remaining site buildings and facilities with residual contaminants. Remove all remaining low-level radioactive waste along with any remaining hazardous and toxic materials. Material removed in the decontamination and dismantling of the nuclear units will be routed to an on-site central processing area. Material certified to be free of contamination will be released for unrestricted disposition, e.g., as scrap or for recycle or general disposal. Contaminated material will be characterized and segregated for additional on-site decontamination, off-site processing (disassembly, chemical cleaning, volume reduction, waste treatment, etc.) and/or packaged for controlled disposal at the regional low-level radioactive waste disposal facility.

- Remove remaining components, equipment, and plant services in support of the area release survey(s).

- Conduct final radiation survey to ensure that all radioactive materials in excess of permissible residual levels have been remediated. This survey may coincide with final NRC site inspection.

Incorporated into the License Termination Plan, the Final Survey Plan details the radiological surveys to be performed once the decontamination activities are completed. The Final Survey Plan is developed using the guidance provided in NUREG/CR-5849, "Manual

for Conducting Radiological Surveys in Support of License Termination." This document delineates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies state-of-the-art, commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that survey design and implementation are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified.

The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on final termination of the license. The NRC will terminate the license if it determines that site remediation has been performed in accordance with the License Termination Plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release.

NRC Acceptance Criteria for Decommissioning

NRC's requirements for decommissioning and license termination are contained in §20, Subpart E (Radiological Criteria for License Termination). The NRC's current position on residual contamination criteria, site characterization, and other related decommissioning issues is outlined in an NRC document entitled "Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites," that was published in the Federal Register on April 6, 1993 (57 FR 13389). Through rulemaking, the NRC has established the decommissioning acceptance criteria to be an annual dose of not more than 25 mRem above natural background to an average member of the critical group from all exposure pathways (i.e. direct radiation, inhalation and ingestion). The critical group is defined in §20.1003 as "the group of individuals reasonably expected to receive the greatest exposure to residual reactivity for any applicable set of circumstances."

Other Regulations and Standards Applicable to Decommissioning

- §190, "Environmental Radiation Protection Standards for Nuclear Power Operation" - limits radiation doses to members of the public from radioactive materials introduced into the general environment as the result of operations that are part of the nuclear fuel cycle.

- §20 "Standards for Protection Against Radiation" - regulates the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual does not exceed the radiation protection standards. According to §20.1001, the total dose to an individual includes doses from licensed and unlicensed radioactive material and from radiation sources other than background radiation. In addition, the requirements of §20.1302 apply to NRC-licensed facilities during decommissioning and when the facility is operational. This regulation prohibits licensees from releasing radioactive materials to an unrestricted area in concentrations that exceed the limits specified in §20 or that exceed limits otherwise authorized in an NRC license.

- §50 Appendix I - provides numerical guidance for keeping radioactive materials in liquid and gaseous effluents released to unrestricted areas "as low as reasonably achievable" during normal operations of a nuclear power reactor.

NRC Decommissioning Process and Survey Procedures

NRC licensees are required to conduct radiation surveys of the premises where the licensed activities were conducted and submit a report describing the survey results. The survey process follows requirements contained in §50.82 that pertain to the decommissioning of a site and termination of a license. This process is designed to result in the unrestricted release of a site.

The current decommissioning regulatory process associated with license termination is comprised of the following basic steps:

- Site radiological characterization;
- Development, submission, and NRC review of PSDAR;
- Performance of decommissioning actions described in the PSDAR and leading to the removal of radioactivity from the site;
- Performance of termination surveys and submittal of the final termination survey report;
- Performance of NRC confirmatory survey; and

- NRC termination of the §50 license.

2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities may begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially damage power block structures including the Reactor, Auxiliary, Fuel Handling and Turbine Buildings. Verifying that subsurface radionuclide concentrations meet NRC site release requirements may require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

Prompt dismantling of site structures is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures, with a work force already mobilized on site, is more efficient and less costly than if the process were deferred. Site facilities quickly degrade without continual maintenance, adding additional expense and creating potential hazards to the public and future workers. Abandonment creates a breeding ground for vermin infestation as well as other biological hazards.

This cost study presumes that non-essential structures and site facilities will be dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are assumed to be removed to a nominal depth of three feet below grade. This depth of removal allows for clearance of the exposed rebar mats, embedded conduit and piping, and structural steel produced in demolition. The three-foot depth also allows for the placement of both gravel for drainage and topsoil for vegetation to be established as erosion control. Site areas affected by the dismantling activities are cleaned and the plant area graded as required to prevent

ponding and inhibit the refloating of subsurface materials. Activities include:

- Demolition of the remaining portions of the containment structure and interior portions of the Reactor Building. Internal floors and walls are removed from the lower levels upward, using controlled blasting techniques. Concrete rubble and clean fill produced by demolition activities are used on site to backfill voids. Suitable materials can be used on site for fill; other wise the rubble is trucked off site for disposal as construction debris.

- Removal of remaining buildings using conventional demolition techniques for above ground structures, including the Turbine Building, Auxiliary Building, Fuel Handling Buildings, and other site structures, including the Breakwater.

- Preparation of the final dismantling program report.

2.1.4 Post-Period 3 - ISFSI Operations and Demolition

Following the transfer of the spent fuel inventory from the Fuel Handling Buildings, the ISFSI will continue to operate under a separate and independent license (§72). Transfer of spent fuel to a DOE or interim facility will be exclusively from the ISFSI once the fuel pool structures have been emptied and the released for decommissioning. Assuming initiation of the federal Waste Management System in 2010, transfer of spent fuel is assumed to begin in 2018 and continue for a period of approximately 22 years, with the final spent fuel shipment presumed to occur in the year 2040.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. Long-term exposure from the spent fuel assemblies will have produced low-level neutron activation of the interior surfaces of the dry storage modules to levels exceeding current release limits. Consequently, portions of the modules will be disposed of as low-level radioactive waste.

The NRC will terminate the §72 license if it determines that site remediation has been performed in accordance with a license termination plan and the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. Once

the requirements are satisfied, the NRC can terminate the license for the ISFSI.

The reinforced concrete dry storage modules are then demolished and disposed of as clean fill, the concrete loading ramps are removed, and the area graded and landscaped to conform with the surrounding environment.

2.2 SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact, (during the SAFSTOR period) with structures maintained in a sound condition. Systems not required to operate in support of the spent fuel pool or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination is performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although a shorter time period is expected for these activities due to the more limited work scope. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

2.2.1 Period 1 - Operations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. While implementing the staffing transition plan, the organization required to manage the intended decommissioning program is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, characterization of the facility and major components, and development of the PSDAR.

The program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines for protection of personnel

from exposure to radiation hazards. It also addresses the continued protection of the health and safety of the public and the environment.

The NRC recognizes that the existing operational technical specifications will require review and modifications to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities must be considered; an environmental report on those concerns not already assessed must be submitted to the NRC for consideration and possible preparation of an environmental impact statement.

The process of placing the plant into SAFSTOR includes, but is not limited to, the following activities:

- Isolate spent fuel storage services and fuel handling systems located in the Fuel Handling Buildings from the power block so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are assumed to be scheduled around the fuel handling systems to the greatest extent possible. The spent fuel contained within dry storage casks at the time of shutdown will remain in dry storage until shipment to DOE can be completed. All remaining spent fuel on site will continue to be stored in the existing spent fuel pools awaiting pickup by DOE. The existing spent fuel storage facilities will continue to operate until all spent fuel is removed from the site, is currently projected to occur in 2040.

- Drain/de-energize/secure all non-contaminated systems not required to support dormancy operations.

- Dispose of contaminated filter elements and resin beds not required for processing wastes from decontamination activities.

- Drain reactor vessel; internals remain in place.

- Drain/de-energize/secure all contaminated systems. Decontaminate systems as required for future maintenance and inspection.

- Prepare lighting and alarm systems if continued use is required. De-energize and/or secure portions of fire protection, electric power, and HVAC systems if continued use is not required.

- Clean loose surface contamination from building access pathways.

- Perform an interim radiation survey of plant; post warning signs as appropriate.

- Erect physical barriers and/or secure all access to radioactive or contaminated areas, except as required for controlled access, i.e., inspection and maintenance.

- Ship spent fuel to a DOE or intermediate facility - continuously throughout Period 1 and into the dormancy period.

- Install security and surveillance monitoring equipment and relocate security fence around secured structures, as required.

This study assumes that demolition would be delayed for those structures located outside the secured area until after the termination of the license.

2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the SAFSTOR alternative. After an optional period of storage (such that license termination is accomplished within 60 years of final shutdown), it is required that the licensee submit an application to terminate the license, along with a License Termination plan (described in Section 2.1.2), thereby initiating the third phase.

Activities required during the planned dormancy period include a 24-hour guard force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. The length of the dormancy period selected for each unit is approximately 30 years.

Spent fuel transfers, from the ISFSI to a federal repository, will continue until the year 2040.

Equipment maintenance, inspection activities, and routine service are performed by resident maintenance personnel. This work force will

maintain the structures in a safe condition, provide adequate lighting, heating, and ventilation, and perform periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that potential releases of radioactive material to the environment are detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of its own actions. Security will be provided by the security fence, sensors, alarms, surveillance equipment, etc., which must be maintained in good condition for the duration of this period. Fire and radiation alarms are also to be monitored and maintained. While remote surveillance is an option, it does not offer the immediate response time of a physical presence.

Variations in the length of the dormancy period are expected to have little effect upon the quantities of radioactive wastes generated from system and structure removal operations. While there will be a decrease in the contamination levels present on all surfaces due to radioactive decay over an increased dormancy duration, it is not expected that any material that is non-releasable at the time of shutdown will decay to a releasable state over the permissible time frame (i.e. 60 years maximum). Without detailed contamination characterization-information, it is not possible to make any further assumptions concerning contamination levels.

Given the levels of radioactivity and spectrum of radionuclides expected from 40 years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone, i.e., there is no significant reduction in waste volume by delaying decommissioning. In fact, SAFSTOR estimates can show a slight increase in the total projected waste volume, due primarily to initial preparation activities for placing the units in safe-storage, as well as from follow-up housekeeping tasks over the caretaking period for the station. Since SAFSTOR does not require system flushes for decontamination purposes, the waste volumes associated with liquid

waste processing have been eliminated. In this case, the cost estimate showed a small decrease in the total low-level waste volume in the SAFSTOR mode relative to DECON.

The delay in decommissioning yields lower working area radiation levels. As such, the difference between the prompt and delayed scenarios is moderated by reduced ALARA controls for the SAFSTOR's lower occupational exposure potential. Because this alternative provides a period of decay for the residual radioactive material, lower radiation fields are encountered than with the DECON alternative. Some of the dismantling activities may employ manual techniques rather than remote procedures. Thus, dismantling operations may be simplified for some tasks. However, this study does not attempt to quantify this effect because it would have an immaterial impact on overall costs.

2.2.3 Periods 3 - 4 Deferred Decommissioning

A License Termination Plan must be prepared at least two years prior to the anticipated date of license termination. Submitted as a supplement to the FSAR or equivalent, the plan must include a site characterization, description of the remaining dismantling activities, plans for site remediation, detailed plans for the final radiation survey, designation of the end-use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan and make the plan available for public comment. A local hearing will also be scheduled. Plan approval will be subject to any conditions and limitations deemed appropriate by the NRC. The licensee may then commence with the final remediation of site facilities and plant services.

Although the initial radiation levels due to ^{60}Co will decrease significantly during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb and ^{59}Ni. Therefore, the dismantling procedures described for the DECON alternative would still be employed during SAFSTOR. Portions of the biological shield will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal.

These systems and components are surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and writing of activity specifications and detailed procedures are also initiated at this time.

Much of the work in developing a License Termination Plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase, as well as the follow-on decontamination and dismantling processes, are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and SAFSTOR scenarios is the absence, in the latter, of any constraint on the availability of the Fuel Handling Buildings for decommissioning. The timing for the SAFSTOR scenario is such that the spent fuel inventory has been removed from the site prior to the initiation of decontamination and dismantling activities, eliminating a significant scheduling hindrance. Any GTCC material generated in the segmentation of the reactor vessel internals is assumed to be directly routed to DOE's geological facility, without the need to provide for interim storage on site.

2.2.4 Period 5 - Site Restoration

For the SAFSTOR alternative, the site restoration activities are the same as those for DECON Period 3, without restriction on the availability of the ISFSI for dismantling and demolition.

3. COST ESTIMATE

The DCPP cost estimate accounts for the unique features of the site, including the primary coolant system, electric power generation systems, site buildings, and structures. The basis of the estimate and its sources of information, methodology, site-specific considerations, assumptions and total costs are described in this section.

3.1 BASIS OF ESTIMATE

A site-specific cost estimate was developed using drawings and plant documents provided by PG&E. Components were inventoried from the mechanical and electrical Piping & Instrument Diagrams (P&ID). Structural drawings and design documents were used to analyze the general arrangement of the facility and to determine estimates of building concrete volumes, steel quantities, numbers and sizes of major components, and areas of the plant to be addressed in remediation of the site.

Representative labor rates for each designated craft and salaried worker were provided by PG&E for use in construction of the unit removal factors, as well as for estimating the carrying costs for site management, worker supervision, and essential support services, e.g., health physics and security.

For purposes of constructing the decommissioning cost estimate, an assumed unit burial rate of $5.05 per pound was used to calculate the cost for disposal of low-level radioactive waste generated in the decontamination and dismantling of DCPP. This rate is derived from the disposal rates charged at the Barnwell low-level waste disposal facility for non-Atlantic compact generators.

3.2 METHODOLOGY

The methodology used to develop this cost estimate follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Ref. 8) and the US DOE "Decommissioning Handbook" (Ref. 9). These references utilize a unit cost factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit cost factors for concrete removal ($/cubic yard), steel removal ($/ton), and cutting costs ($/inch) were developed from the labor cost information provided by PG&E. The

activity-dependent costs are estimated with the item quantities (cubic yards, tons, inches, etc.) developed from plant drawings and inventory documents.

The unit cost factors used in this study reflect the latest available information about worker productivity in decommissioning, including the Shippingport Station Decommissioning Project completed in 1989, as well as from TLG's involvement in the decommissioning planning and engineering for the Shoreham, Yankee Rowe, Big Rock Point, Maine Yankee, Oyster Creek, Trojan, Rancho Seco, Pathfinder, and Cintichem reactor facilities.

An activity duration critical path was used to determine the total decommissioning program schedule. The program schedule is used to determine the period-dependent costs for program management, administration, field engineering, equipment rental, quality assurance, and security. The study used typical salary and hourly rates for personnel associated with period-dependent costs for the region in which the station is located. Some of the costs for removal of radioactive components/structures were based on information obtained from the "Building Construction Cost Data," published by R. S. Means (Ref. 10). Examples of unit cost factor development are presented in the AIF/NESP-036 study. Appendix A presents the detailed development of a typical site-specific unit cost factors. Appendix B provides the values contained within one set of factors developed for the DCPP analyses.

The unit cost factor method provides a demonstrable basis for establishing reliable cost estimates. The detail of activities provided in the unit cost factors for activity time, labor costs (by craft), and equipment and consumable costs provide assurance that cost elements have not been omitted. These detailed unit cost factors, coupled with the plant-specific inventory of piping, component, and structures, provide a high degree of confidence in the reliability of the cost estimates.

3.3 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, is composed of a number of distinct cost line items. These direct expenditures, however, do not compose the total cost to accomplish the project goal, i.e., license termination and site restoration.

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool

breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes monies to cover these types of expenses. The allotment of these monies is discussed further herein.

In addition to the routine uncertainties that contingency addresses, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration of these uncertainties is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term "financial risk." This cost study, does not add any additional costs to the estimate for financial risk since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk should be revisited periodically and addressed through repeated revisions or updates of the base estimate.

3.3.1 Contingency

The activity- and period-dependent costs are combined to develop the total decommissioning costs. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook" (Ref. 11) as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this estimate are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, a contingency factor has been applied. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this estimate, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the units.

The use and role of contingency within decommissioning estimates is not a "safety factor issue." Safety factors provide additional security and address situations that may never occur. Contingency funds are expected to be fully expended throughout the program. They also provide assurance that sufficient funding is available to accomplish the intended tasks. Some of the rationale for (and need to incorporate) contingency within any estimate is offered in the following discussion. An estimate without contingency, or from which contingency has been removed, can disrupt the orderly progression of events and jeopardize a successful conclusion to the decommissioning process.

The most technologically challenging task in decommissioning a commercial nuclear station will be the disposition of the reactor vessel and internal components, which have become highly radioactive after a lifetime of exposure to radiation produced in the core. The disposition of these highly radioactive components forms the basis for the critical path (schedule) for decommissioning operations. Cost and schedule are interdependent; any deviation in schedule has a significant impact on the cost for performing a specific activity.

Disposition of the reactor vessel internals involves the underwater cutting of complex components that are highly radioactive. Costs are based upon optimum segmentation, handling, and packaging scenarios. The schedule is primarily dependent upon the turnaround time for the heavily shielded shipping casks, including preparation, loading, and decontamination of the containers for transport. The number of casks required is a function of the pieces generated in the segmentation activity, a value calculated on optimum performance of the tooling employed in cutting the various subassemblies. The risk (uncertainty) associated with this task is that the expected optimization may not be achieved, resulting in delays and additional program costs. For this reason, contingency must be included to mitigate the consequences of the expected inefficiencies inherent in this complex activity, along with related concerns associated with specialty tooling modifications and repairs, field changes, discontinuities in the coordination of plant services, system failure, water clarity, lighting, computer-controlled cutting software corrections, etc. Experience in decommissioning other plants in the past has shown that many of these problem areas have occurred during, and in support of, the segmentation process. Contingency dollars are an integral part of the total cost to complete this task.

Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, follow-on related activities.

The following list is a composite of some of the activities, assembled from past decommissioning programs, in which contingency dollars were needed to respond to, compensate for, and/or provide adequate funding of decontamination and dismantling tasks:

Incomplete or Changed Conditions:

- Unavailable/incomplete operational history, which led to a recontamination of a work area because a sealed cubicle (incorrectly identified as being non-contaminated) was breached without controls.

- Surface coatings covering contamination, which, due to an incomplete characterization, required additional cost and time to remediate.

- Additional decontamination, controlled removal, and disposition of previously undetected (although at some sites, suspected) contamination due to access gained to formerly inaccessible areas and components.

Adverse Working Conditions:

- Lower than expected productivity due to high temperature environments, resulting in a change in the working hours (shifting to cooler periods of the day) and additional manpower.

- Confined space, low-oxygen environments where supplied air was necessary and additional safety precautions prolonged the time required to perform required tasks.

Maintenance, Repairs and Modifications

- Facility refurbishment required to support site operations, including those needed to provide new site services or to maintain the integrity of existing structures.

- Damage control, repair, and maintenance from birds' nesting and fouling of equipment and controls.

- Building modification, i.e., re-supporting of floors to enhance loading capacity for heavily shielded casks.

- Roadway upgrades on site to handle heavier and wider loads; roadway rerouting, excavation, and reconstruction.

- Requests for additional safety margins by a vendor.

- Requests to analyze accident scenarios beyond those defined by the removal scenario (requested by the NRC to comply with "total scope of regulation").

- Additional collection of site run-off and processing of such due to disturbance of natural site contours and drainage.

- Concrete coring for removal of embedments and internal conduit, piping, and other potentially contaminated material not originally identified as being contaminated.

- Modifications required to respond to higher than expected worker exposure, water clarity, water disassociation, and hydrogen generation from high temperature cutting operations.

- Additional waste containers needed to accommodate cutting particulates (fines), inefficient waste geometries, and excess material.

Labor

- Turnover of personnel, e.g., craft and health physics. Replacement of labor is costly, involving additional training, badging, medical exams, and associated processing procedures. Recruitment costs are incurred for more experienced personnel and can include relocation and living expense compensation.

- Additional personnel required to comply with NRC mandates and requests.

- Replacement of personnel due to non-qualification and/or incomplete certification (e.g., welders).

Schedule

- Schedule slippage due to a conflict in required resources, i.e., the licensee was forced into a delay until prior (non-licensee) commitments of outside resources were resolved.

- Rejection of material by NRC inspectors, requiring refabrication and causing program delays in activities required to be completed prior to decommissioning operations.

Weather

- Weather-related delays in the construction of facilities required to support site operations (with compensation for delayed mobilization made to vendor).

The cost model incorporates considerations for items such as those described above, generating contingency dollars (at varying percentages of total line-item cost) with every activity. The purpose of the contingency is to allow for the costs of high probability program problems occurring in the field where the occurrence, duration, and severity cannot be accurately predicted, and so their associated costs have not been included in the basic estimate. Past decommissioning experience has shown that unforeseeable cost elements are almost certain to occur in the field and may have a cumulative impact. In this study TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows.

Decontamination	50%
Contaminated Component Removal	25%
Contaminated Component Packaging	10%
Contaminated Component Transport	15%
Low-Level Radioactive Waste Disposal	25%
Waste Recycling/Recovery	15%
Reactor Segmentation	75%
NSSS Component Removal	25%
Reactor Waste Packaging	25%
Reactor Waste Transport	25%
Reactor Vessel Component Disposal	50%
GTCC Disposal	15%
Non-Radioactive Component Removal	15%
Heavy Equipment and Tooling	15%
Supplies	25%
Engineering	15%
Energy	15%
License Termination Survey	30%
Construction	15%
Taxes and Fees	10%
Insurance	10%
Staffing	15%

3.3.2 Financial Risk

Financial risk refers to the possibility and associated probabilities of certain events occurring that could increase or decrease costs for decommissioning.

Included within the category of financial risk are:

- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, or state and local hearings.

- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously

expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), or variations in plant inventory/configuration not indicated by the as-built drawings.

- Regulatory changes, e.g., affecting worker health and safety, site release criteria, waste transportation, or disposal.

- Policy decisions altering federal and state commitments, e.g., the ability to accommodate certain waste forms for disposition, or the adjustment of the timetable for such.

- Pricing changes for basic inputs, such as labor, energy, materials, and burial. Some of these inputs may vary slightly, e.g. -10% to +20%; burial could vary from -50% to +200% or more.

It has been TLG's experience that the results of a risk analysis, when compared with the base case estimate for decommissioning, indicate that the chances of the base decommissioning estimate's being too high is a low probability, and the chances that the estimate is too low is a much higher probability. This is primarily due to the pricing uncertainty for low-level radioactive waste burial, and to a lesser extent due to schedule increases from changes in plant conditions and pricing variations in the cost of labor (both craft and staff). TLG did not perform a risk analysis for the DCPP and therefore the cost estimate does not include any increase in decommissioning costs as a result of risk analysis.

3.4 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of these considerations, identified below, are included in this cost study.

3.4.1 Spent Fuel Disposition

For purposes of this cost study, PG&E provided a spent fuel scenario management plan that addressed the storage scenario for both DCPP nuclear units. The PG&E spent fuel disposition scenario assumes that

DOE will begin receipt of spent fuel from DCPP in 2018. It also assumes construction of an ISFSI prior to final plant shutdown in order to support continued plant operations. For both scenarios, the fuel will remain in wet storage in the existing fuel pool(s) for 12 years following shutdown of each unit. During this time, the existing ISFSI will be expanded to accept the inventory of fuel from the pools. All fuel will be transferred to the ISFSI within 12 years of final unit shutdown. The last spent fuel shipment is expected to occur in 2040.

3.4.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded transportation casks. Segmentation and packaging of the internals' packages are performed in the refueling canal, where a turntable and remote cutter will be installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and Department of Transportation (DOT) regulations dictate segmentation and packaging methodology. All packages must meet the current physical and radiological limitations and regulations. Cask shipments will be made in DOT-approved, currently available, truck casks.

The dismantling of reactor internals at DCPP will generate radioactive waste generally unsuitable for shallow land disposal (GTCC). Although the material is not classified as high-level waste, DOE has indicated it will accept title to this waste for disposal at the future high-level waste repository. However, an acceptance criteria or a disposition schedule for this material has not been established, and numerous questions remain as to the ultimate disposal cost and waste form requirements. As such, for purposes of this study, the GTCC waste has been packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and shipped by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for disposal together with the steam generators.

3.4.3 Steam Generators and Other Primary Coolant System Components

The steam generators' size and weight, as well as their configuration in the Reactor Building and limited access in the Reactor Building itself, place constraints on their intact removal. Modifications to the Reactor Building are necessary for component extraction, due to the fact that the only large access to the building is the existing equipment hatch, located above grade level. To remove the generators through this hatch requires that the units be positioned horizontally, typically impossible due to physical impediments within the structure.

Determination of the removal strategy requires several different considerations. Considerations for the extraction process include modifications to the Reactor Building for removal of the generators, rigging needed to maneuver and extract the generators from the structure, and component preparations needed to transport the generators to a disposal site.

A potential method for removal (and the one used as the basis in this estimate) is the extraction of the generators through a hatch created in the side of the Reactor Building. Sections of concrete are removed to create an opening large enough to extract the steam generators. Prior to sectioning and removal of the steam generator cubicle walls, adjoining floor slabs, and floor grating must be accomplished before the generators can be maneuvered to the opening.

The hatch is re-created using a diamond wire saw to section the containment wall into removable blocks. Once the building is opened, grating within the work area is decontaminated and removed. Next, a trolley crane is set up for removal of the generators. By setting the trolley crane first, it can be used to lower portions of the steam generator cubicle walls that will have to be removed as part of the building modification effort. It also can be used to help remove portions of the floor slab. A 15-foot section of the cubicle wall will be dismantled to allow the maneuvering of the generators within the building. Large cubicle wall sections are lowered out of the Reactor Building using the trolley crane, where they can be decontaminated and transported to the material handling area.

The upper steam generator domes will be disconnected from the surrounding piping and supports. The steam dome will then be rigged

for removal. The steam domes will be cut from the lower shell units and transferred to a laydown area for further segmentation. A prefabricated end-cap will mate with the exposed cut end on the lower shell unit. This end-cap will cover the exposed lower shell tube bundle, recreating a leaktight container. The lower shell units will then be disconnected from all piping and supports, rigged for removal and maneuvered into the open area where they will be lowered onto a dolly. The dolly will allow the lower end of the steam generator to rotate through the opening as it is being lowered. Nozzles and other openings will be welded closed. When this stage has been completed, the generator lower shell unit will be lifted onto a multi-wheeled transporter and moved to an on-site storage area to await transport to the disposal facility. The three remaining steam generators will be removed using the same technique. Once the components have been removed, a portion of the opening will be closed using concrete blocks. A smaller opening will be covered with a temporary barrier to allow for future access.

Once at the storage area, each generator lower shell unit will have a two-inch thick carbon steel membrane welded to its outside surface for shielding during transport. The units will then be loaded onto a multi-wheeled transporter and moved to an on-site rail head where they will be shipped to the Ward Valley waste disposal facility. Depending upon the proximity of the rail head to the disposal location, the units may be off-loaded from the train and onto multi-wheeled transporters to be moved for the remaining distance to the disposal site.

The size and weight of the generator packages was a concern in evaluating transportation alternatives. As such, discussions were held with both the railroad and Lampson, Inc. (rigging), on the moving of the generators. Both companies have had experience with moving large nuclear components, and were able to supply costs based on specific generator dimensions and weight. TLG was also able to apply its experience gained in the planning of the disposition of the steam generators at the Trojan site, where Lampson was a subcontractor.

3.4.4 Transportation Methods

For the purposes of the cost estimate, it was assumed that the low-level radioactive waste produced in the decontamination and dismantling of the nuclear units will be moved overland by truck, shielded van, rail,

and/or multi-wheeled transporter to the regional burial facility. Transport costs were derived assuming a final destination of no greater than 1,000 miles from the plant using published tariffs from Tri-State Motor Transit (Ref. 12).

3.4.5 Low-Level Radioactive Waste Disposal

For purposes of constructing the decommissioning cost estimates, an assumed unit burial rate of $5.05 per pound was used to calculate the cost for disposal of low-level radioactive waste generated in the decontamination and dismantling of DCPP. This rate is derived from the disposal rates charged at the Barnwell low-level waste disposal facility for non-Atlantic compact generators.

To the greatest extent practical, non-compactable low-level radioactive waste is treated to reduce the total volume of radioactive material requiring controlled disposal. The treated material meeting the regulatory and/or site release criteria is released as clean scrap, requiring no further cost consideration. Material not meeting release criteria will be processed for volume reduction and packaged for controlled disposal as radioactive waste. Material/waste recovery and recycling are assumed to be performed by an off site, licensed processing center.

Compactable DAW, such as booties, glove liners, respirator filter cartridges, shipping containers, radiological controls survey materials, etc. will be assumed to be drummed and compacted to 10% of their original volume. This is the minimum practical volume to which low-level waste can be compacted to reduce costs.

3.4.6 Site Conditions Following Decommissioning

A final radiation survey will be conducted to ensure that all radioactive materials in excess of permissible residual levels have been remediated in accordance with 10 CFR §20 Subpart E "Radiological Criteria for License Termination." This survey may coincide with final NRC site inspection.

The NRC will terminate the 10 CFR §50 license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated

documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Local building codes and state environmental regulations will dictate the next step in the decommissioning process.

3.5 ASSUMPTIONS

The following are the major assumptions made in the development of the cost estimates for decommissioning DCPP.

3.5.1 Estimating Basis

1. Costs are calculated in 2002 dollars. TLG has not included factors for present-value economic analysis, escalation, or general inflation.

2. Both units are assumed to be essentially identical except for common structures and systems. Common systems and structures are assigned to and incorporated within the estimate for Unit 2 since they are required to support decommissioning operations.

3. Plant drawings, equipment, structural specifications, and construction details were provided by PG&E.

3.5.2 Labor Costs

1. The craft labor required to decontaminate and dismantle the DCPP units will be acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis.

2. Costs for site administration, operations, construction, and maintenance personnel are based upon current, average salary information provided by PG&E.

3. PG&E, as the licensee, will oversee the decommissioning operations, as well as provide site security, radiological controls, and overall site administration during decommissioning and dismantling. PG&E will hire a Decommissioning Operations Contractor (DOC), providing contract management of the decommissioning labor force and subcontractors. The DOC provides engineering services for such items as writing activity specifications, procedures, activation analyses, or structural modifications.

4. The costs associated for the transition of an operating to a decommissioning organization, (e.g., separation packages, retraining, severance, or incentives) are not included in this estimate.

3.5.3 Design Conditions

1. Any fuel cladding failure that has occurred or may occur during the lifetime of the plant is assumed:

   - to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g. cesium-137, strontium-90, or transuranics) has been prevented from reaching levels exceeding those which permit the major primary coolant system components to be shipped as Low Specific Waste (LSA) or Surface Contaminated Object (SCO) waste and to be buried within the requirements of 10 CFR 61 or the regional burial ground; or

   - to have necessitated systematic decontamination during the operating life of the plant so that the radionuclide levels will be acceptable for transport as LSA or SCO waste and the burial will be within the requirements of 10 CFR 61.

2. The estimated curie content of the vessel and internals at final shutdown was derived from those listed in NUREG/CR-3474 (Ref. 13). Actual estimates will be derived from the Ci/gram values in NUREG/CR-3474 and adjusted for the different mass of components and projected operating life, as well as for different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130 (Ref. 14) and NUREG/CR-0672 (Ref. 15), and benchmarked to the long-lived values from NUREG/CR-3474.

3.5.4 General

1. PG&E provides for any necessary electrical power to be brought on site required to decommission the plant. Energy costs are included in the estimate.

2. Material and heavy equipment rental and operating costs are taken from R.S. Means Building Construction Cost Data.

3. Selected secondary side systems are assumed to be contaminated, and will require radiological controls during dismantling, and off-site waste processing. Systems assumed to be affected include:

    - Auxiliary Steam
    - Condensate
    - Extraction Steam and Heater Drip
    - Lube Oil Distribution and Purification
    - Turbine Steam Supply
    - Turbine and Generator
    - Main Condensers
    - Main Turbine/Generator

4. Contaminated concrete surfaces in the Reactor Buildings, Fuel Handling Buildings, Containment Penetration Areas, Radwaste Storage Building and Auxiliary Building will require decontamination by scabbling (removal of concrete surfaces to a depth of one-half inch), or a drill and spall technique (removal of concrete surfaces to a depth of two inches).

5. Radioactively contaminated piping, components, and structures other than the reactor vessel and internals are assumed to meet DOT limits for LSA or SCO material. For transportation calculations, the distance from the plant site to the (burial site) is not greater than 1,000 miles. Rates for shipping radioactive wastes were provided by Tri-State Motor Transit in published tariffs for this cargo.

6. The reactor vessel and internals disposal costs were based on remote in-place segmentation, packaging in shielded casks, and shipping by truck to the burial ground. A maximum normal road weight limit of 80,000 pounds is assumed for all truck shipments, with the exception of anticipated overweight cask shipments. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs and tractor-trailer. The maximum curies per shipment assumed permissible is based upon the license limits of available shielded shipping casks. The number and curie content of vessel segments were selected to meet these limits.

7. The number of cask shipments out of the Reactor Building is expected to average three, every two weeks. In the DECON alternative, the reactor vessel and coolant system will be chemically

decontaminated using one chemical flush and two water rinses prior to segmentation. Typically, a decontamination factor of 10 is expected from this operation.

8. This study estimates that there will be some radioactive waste generated which is greater than 10 CFR 61 Class C quantities (GTCC), resulting from disposal of the highly activated sections of the reactor vessel internals. This waste will most likely be disposed of as high-level waste in the DOE's repository unless an alternative solution is approved by the NRC. The cost of disposal, unlike that for the spent fuel, is not addressed by DOE's 1 mill/kWhr surcharge, and has been estimated from equivalent disposal costs for spent nuclear fuel.

9. Control elements will be removed and disposed of along with the spent fuel assemblies.

10. GTCC waste generated through segmentation of the reactor vessel internals will be transferred to the on-site ISFSI or to the DOE high-level repository within the approximate 12-year decay period following plant shutdown. If the DOE were to default on its obligations to accept spent fuel and GTCC material, decommissioning costs would almost certainly increase.

11. This study does not address the cost for the removal and disposal of spent fuel from the site. Ultimate disposition of the spent fuel is the province of DOE's Waste Management System, as defined by the Nuclear Waste Policy Act and funded through the 1 mill/kWhr electrical generation surcharge. If the DOE were to delay its obligations to accept spent fuel later than a time consistent with its initial pickup of spent fuel from DCPP in 2018, then decommissioning costs would increase.

12. Spent fuel is assumed to remain in the spent fuel pools for a 12-year decay period to satisfy the dry cask storage system design criteria.

13. The final reactor core discharge will be transferred to the spent fuel pool, located in the Fuel Handling Buildings, where it will remain for at least twelve years. Additional storage of fuel on site will be necessary prior to its transfer to the DOE for final disposal.

14. Scrap generated during decommissioning is not included as a salvage credit line item in this study for two reasons: (1) the scrap

value merely offsets the associated site removal and scrap processing costs, and (2) a relatively low value of scrap exists in the market. Scrap processing and site removal costs are not included in the estimate.

15. PG&E will make economically reasonable efforts to salvage equipment during decommissioning. Nonetheless, because placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to overall decommissioning expenses, this estimate does not attempt to quantify the value that PG&E might realize based upon those efforts. For purposes of this study, decommissioning is assumed to begin in 2021; it may occur earlier or later, depending on a variety of economic and regulatory factors. Additionally, because of PG&E's life cycle management of equipment (a program designed to optimize equipment performance through preventive maintenance), it is difficult to predict the remaining life of on site equipment when decommissioning begins. Finally, it is difficult to predict whether the market for used equipment will be stronger or weaker than it is at the time of this estimate. For these reasons, it is not possible to provide an estimate of the salvage value of the equipment at DCPP. Moreover, any salvage value would be small when compared to total decommissioning expenses.

16. The PG&E staffing requirements during decommissioning vary with the level of effort associated with the various phases of the project. Once the decommissioning program commences, only those staff positions necessary to support the decommissioning program are included. Costs are not included in this study for staff transition from plant operations to decommissioning.

17. Engineering services for such items as writing activity specifications, detailed procedures, detailed activation analyses, and structural modifications, etc. are assumed to be provided by outside contractors.

18. PG&E will remove items of personal property owned by PG&E that can be removed without the use of special equipment.

19. PG&E has sufficient scaffolding to support the decommissioning project. No costs associated with the purchase or rental of scaffolding are included in the estimate.

20. Existing warehouses will remain for use by PG&E and its subcontractors. Those warehouses scheduled for removal will be dismantled as they are no longer needed to support the decommissioning program; others may remain for alternate use.

21. PG&E will perform the following activities as a staff function, shortly after cessation of operations at Unit 2:

    - Fuel oil tanks will be emptied. Tanks will be cleaned by flushing or steam cleaning as required prior to disposal.

    - Acid and caustic tanks will be emptied through normal usage; any excess acid or caustic removed to support disposal of the storage container(s) are returned to the vendor.

    - Lubricating and transformer oils will be drained and removed from the site by a waste disposal vendor.

22. The decommissioning activities will be performed in accordance with the current regulations, which are assumed to still be in place at the time of decommissioning. Changes in current regulations may have a cost impact on decommissioning.

23. This study follows the principles of ALARA through the use of work duration adjustment factors that incorporate such items as radiological protection instruction, mock-up training, the use of respiratory protection, and personnel protective clothing. These items lengthen a task's duration, which increase the costs and lengthens the schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to §20 worker exposure limits may impact the decommissioning cost and project schedule.

24. Nuclear liability insurance provides coverage for offsite damage or injuries due to radiation exposure from equipment and material. Nuclear property insurance provides protection against direct physical damage to onsite property by a broad range of causes including, radioactive contamination, fires, floods, etc. This estimate includes the premium cost for both liability and property insurance. PG&E provided current nuclear liability and property insurance premiums. These premiums are adjusted to reflect the relative changes in risk during the various phases of

decommissioning. Insurance is required until both the Part 50 and Part 72 are terminated

25. Only existing site structures and those presently planned will be considered in the decommissioning cost.

26. The perimeter fence and in-plant security barriers will be moved as appropriate to conform with the Site Security Plan in force at the various stages in the project.

27. The existing electrical switchyard will remain after decommissioning in support of the utility's electrical transmission and distribution system.

28. Underground metal and concrete piping will either be surveyed in place and released, or excavated and removed for survey. Any piping that exceeds the site release criteria will be removed.

29. Property tax payments for DCPP are not included in this estimate.

3.6 COST ESTIMATE SUMMARY

Summaries of the radiological decommissioning costs and annual expenditures are provided in Tables 3.1 and 3.2. The costs were extracted from the detailed cost tables in Appendices C & D, and divided into five categories, PG&E Labor, Equipment and Materials, Contractor Labor, Burial, and Other. The following should be considered when reviewing Appendices C and D:

- "Decon" as used in the headings of these tables, refers to decontamination activities (as opposed to the NRC term DECON), which refer to the prompt removal decommissioning scenario.

- "Total" as used in the headings of these tables, is the sum of Decon, Remove, Pack, Ship, Bury, and Contingency, as well as other miscellaneous items not listed (such as engineering and preparations).

- The subtotal reported for the major cost categories does not include contingency, which is reported in a separate column.

- "Other" includes different types of costs that are not easily categorized. For instance, in systems removal and structures decontamination, the "Other" cost consists of the off-site recycling costs for low-level radioactive

waste. In most of the engineering preparatory activities the "Other" cost is strictly engineering labor; however, "Other" also includes taxes, insurance, plant energy budgets, and regulatory fees.

TABLE 3.1a
SCHEDULE OF ANNUAL EXPENDITURES
DECON UNIT 1
(2002 Dollars)

Year	PG&E Labor	Equipment & Materials	Contractor Labor	Burial	Other	Yearly Totals
2021	5,547,377	2,381,238	2,487,881	1,131,341	2,939,654	14,487,491
2022	20,047,451	8,605,465	14,647,881	4,088,511	10,623,502	58,012,810
2023	21,258,915	14,884,293	22,246,880	22,367,201	3,369,110	84,126,398
2024	21,194,678	15,606,509	23,693,952	27,573,020	1,149,009	89,217,168
2025	18,747,094	14,471,071	21,986,005	25,562,136	1,118,713	81,885,019
2026	15,558,491	11,149,372	17,038,566	19,679,343	1,024,117	64,449,890
2027	4,891,853	37,500	488,207	0	707,670	6,125,230
2028	4,904,604	37,500	489,545	0	708,993	6,140,642
2029	4,891,853	37,500	488,207	0	707,670	6,125,230
2030	4,891,853	3,677,500	488,207	0	707,670	9,765,230
2031	5,431,853	7,517,500	1,028,207	0	752,670	14,730,230
2032	5,444,604	6,002,500	1,029,545	0	753,993	13,230,642
2033	4,794,164	2,327,500	737,442	0	752,664	8,611,770
2034	1,444,189	3,677,500	206,226	0	752,614	6,080,530
2035	1,894,189	7,517,500	656,226	0	752,614	10,820,530
2036	1,897,248	6,002,500	656,545	0	753,936	9,310,230
2037	7,666,470	6,951,638	7,411,803	8,189,439	869,921	31,089,271
2038	6,099,036	1,869,967	5,835,776	2,284,422	675,345	16,764,546
2039	1,581,432	5,239,500	7,688,837	0	359,846	14,869,614
2040	1,568,134	5,225,248	7,658,566	0	15,549,170	30,001,118
	159,755,488	123,219,300	136,964,505	110,875,414	45,028,881	575,843,588

TABLE 3.1b
SCHEDULE OF ANNUAL EXPENDITURES
DECON UNIT 2
(2002 Dollars)

Year	PG&E Labor	Equipment & Materials	Contractor Labor	Burial	Other	Yearly Totals
2023	402,500	842,500	165,000	0	270,000	1,680,000
2024	237,500	37,500	0	0	225,000	500,000
2025	13,968,627	5,795,926	6,687,035	2,660,585	6,094,731	35,206,905
2026	20,476,977	9,905,468	15,303,036	8,230,499	7,391,659	61,307,639
2027	21,331,089	16,402,159	24,727,894	27,560,667	1,150,789	91,172,598
2028	20,124,408	18,297,783	25,923,039	30,753,197	1,198,414	96,296,842
2029	17,321,980	17,913,970	24,124,073	30,106,795	1,182,627	90,649,444
2030	6,015,823	3,677,500	1,185,629	0	707,663	11,586,615
2031	6,555,823	7,517,500	1,725,629	0	752,663	16,551,615
2032	6,571,654	6,002,500	1,728,877	0	753,985	15,057,017
2033	6,305,823	2,327,500	1,475,629	0	752,663	10,861,615
2034	6,105,823	3,677,500	1,275,629	0	752,663	11,811,615
2035	6,555,823	7,517,500	1,725,629	0	752,663	16,551,615
2036	6,571,654	6,002,500	1,728,877	0	753,985	15,057,017
2037	12,979,138	7,149,637	10,440,868	8,121,239	869,945	39,560,827
2038	10,765,830	10,293,129	11,815,732	2,265,398	687,150	35,827,240
2039	5,456,464	85,467,891	26,503,564	0	473,028	117,900,948
2040	5,261,853	81,020,856	25,144,870	21,795	15,662,779	127,112,153
2041	1,144,370	3,096	2,765,673	2,670,917	45,782	6,629,838
	174,153,160	289,852,415	184,446,683	112,391,093	40,478,190	801,321,541

TABLE 3.2a
SCHEDULE OF ANNUAL EXPENDITURES
SAFSTOR UNIT 1
(2002 Dollars)

Year	PG&E Labor	Equipment & Materials	Contractor Labor	Burial	Other	Yearly Totals
2021	4,850,631	846,248	1,857,546	0	2,284,698	10,321,311
2022	17,529,510	3,058,223	6,712,913	0	8,256,582	37,299,786
2023	8,823,891	1,775,062	2,053,322	433,490	2,388,083	15,473,848
2024	6,031,467	354,042	489,522	53,734	562,561	7,491,326
2025	6,015,637	353,177	488,184	53,588	561,638	7,472,224
2026	6,015,637	353,177	488,184	53,588	561,638	7,472,224
2027	6,015,637	353,177	488,184	53,588	561,638	7,472,224
2028	6,031,467	354,042	489,522	53,734	562,561	7,491,326
2029	6,015,637	353,177	488,184	53,588	561,638	7,472,224
2030	6,015,637	3,993,177	488,184	53,588	561,638	11,112,224
2031	6,555,637	7,833,177	1,028,184	53,588	606,638	16,077,224
2032	6,571,467	6,319,042	1,029,522	53,734	607,561	14,581,326
2033	5,953,236	2,643,177	737,427	53,588	601,759	9,989,187
2034	2,889,978	3,993,177	206,277	53,588	562,118	7,705,137
2035	3,339,978	7,833,177	656,277	53,588	562,118	12,445,137
2036	3,346,999	6,319,042	656,595	53,734	562,918	10,939,288
2037	3,139,978	2,643,177	606,277	53,588	562,118	7,005,137
2038	2,939,978	353,177	406,277	53,588	562,118	4,315,137
2039	2,939,978	353,177	406,277	53,588	562,118	4,315,137
2040	2,927,675	353,177	396,277	53,588	556,966	4,287,681
2041	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2042	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2043	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2044	1,726,375	316,542	116,554	53,734	237,149	2,450,354
2045	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2046	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2047	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2048	1,726,375	316,542	116,554	53,734	237,149	2,450,354
2049	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2050	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2051	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2052	1,726,375	316,542	116,554	53,734	237,149	2,450,354
2053	1,721,658	315,677	116,236	53,588	236,501	2,443,659
2054	4,040,322	594,075	3,033,213	228,896	321,736	8,218,242
2055	16,569,245	2,098,401	18,795,122	1,176,180	1,279,348	39,918,296
2056	16,944,801	9,839,187	22,281,443	19,515,241	4,275,457	72,856,128
2057	13,553,369	13,855,245	22,385,072	29,045,677	5,691,175	84,530,538
2058	7,351,707	13,855,245	18,977,249	29,045,677	5,675,946	74,905,824
2059	483,863	6,488,430	8,322,722	13,602,130	2,651,906	31,549,051
2060	416,307	2,161,308	3,262,031	0	22,375	5,862,020
2061	1,033,195	5,363,958	7,576,629	0	22,314	13,996,095
2062	670,869	3,482,899	4,919,619	0	14,487	9,087,874
	197,409,433	112,282,138	131,238,258	96,880,690	45,640,304	583,450,824

TABLE 3.2b
SCHEDULE OF ANNUAL EXPENDITURES
SAFSTOR UNIT 2
(2002 Dollars)

Year	PG&E Labor	Equipment & Materials	Contractor Labor	Burial	Other	Yearly Totals
2023	402,500	842,500	165,000	0	270,000	1,680,000
2024	237,500	37,500	0	0	225,000	500,000
2025	12,249,273	2,653,289	5,235,246	1,234,596	4,477,493	25,849,897
2026	15,404,947	3,220,843	6,506,889	1,480,804	5,353,516	31,966,999
2027	4,891,819	400,584	1,464,610	53,588	561,651	7,372,252
2028	4,904,571	401,578	1,468,622	53,735	562,574	7,391,080
2029	4,891,819	400,584	1,464,610	53,588	561,651	7,372,252
2030	4,891,819	4,040,584	1,464,610	53,588	561,651	11,012,252
2031	5,431,819	7,880,584	2,004,610	53,588	606,651	15,977,252
2032	5,444,571	6,366,578	2,008,622	53,735	607,574	14,481,080
2033	5,181,819	2,690,584	1,754,610	53,588	606,651	10,287,252
2034	4,981,819	4,040,584	1,554,610	53,588	606,651	11,237,252
2035	5,431,819	7,880,584	2,004,610	53,588	606,651	15,977,252
2036	5,444,571	6,366,578	2,008,622	53,735	607,574	14,481,080
2037	3,390,826	2,690,584	1,700,868	53,588	583,537	8,419,402
2038	1,495,173	400,584	1,267,158	53,588	562,247	3,778,751
2039	1,495,173	400,584	1,267,158	53,588	562,247	3,778,751
2040	1,483,682	400,584	1,255,818	53,588	557,094	3,750,766
2041	573,217	363,084	488,177	53,588	236,494	1,714,560
2042	573,217	363,084	488,177	53,588	236,494	1,714,560
2043	573,217	363,084	488,177	53,588	236,494	1,714,560
2044	574,788	364,078	489,514	53,735	237,142	1,719,258
2045	573,217	363,084	488,177	53,588	236,494	1,714,560
2046	573,217	363,084	488,177	53,588	236,494	1,714,560
2047	573,217	363,084	488,177	53,588	236,494	1,714,560
2048	574,788	364,078	489,514	53,735	237,142	1,719,258
2049	573,217	363,084	488,177	53,588	236,494	1,714,560
2050	573,217	363,084	488,177	53,588	236,494	1,714,560
2051	573,217	363,084	488,177	53,588	236,494	1,714,560
2052	574,788	364,078	489,514	53,735	237,142	1,719,258
2053	573,217	363,084	488,177	53,588	236,494	1,714,560
2054	573,217	363,084	488,177	53,588	236,494	1,714,560
2055	573,217	363,084	488,177	53,588	236,494	1,714,560
2056	8,230,983	2,101,376	13,723,416	1,051,068	1,151,599	26,258,441
2057	12,237,128	7,768,680	19,821,806	12,252,551	3,021,843	55,102,007
2058	17,031,454	16,977,602	26,764,735	31,079,522	5,972,715	97,826,028
2059	15,725,639	16,977,602	25,637,752	31,079,522	5,964,506	95,385,022
2060	4,932,336	43,981,067	24,877,476	18,641,753	3,571,905	96,004,536
2061	3,728,096	83,879,669	26,277,215	0	53,674	113,938,655
2062	2,420,709	54,464,333	17,062,192	0	34,854	73,982,088
	160,564,838	282,714,853	196,087,530	98,374,759	41,800,865	779,542,846

4. SCHEDULE ESTIMATE

The schedule for the decommissioning scenarios considered in this DCPP study followed the sequence presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plan outlined for the DCPP inventory.

Figure 4.1 presents a schedule for the prompt decommissioning alternative; the assumptions supporting this schedule are listed in Section 4.1. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the Appendix C cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project 98" computer software (Ref. 16).

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule estimates reflect the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The durations used in the precedence networks reflect the actual man-hour estimates from the cost tables in Appendix C, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedules.

- All work (except vessel and internals removal activities) is performed during an 8-hour workday, 5 days per week, with no overtime. There are 11 paid holidays per year.

- The fuel handling facilities located in the Fuel Handling Buildings will be isolated and serve as interim wet fuel storage facilities until such time that all spent fuel has been discharged from the spent fuel pools, i.e., within approximately 12 years from shutdown of each unit. The pools are assumed to accommodate the final core discharge from each unit, allowing decontamination and dismantling to commence on each unit's power block structures without constraint. Decontamination and dismantling of the Fuel Handling Buildings are initiated once the transfer of spent fuel to the on-site ISFSI is complete.

- Reactor vessel and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.

- Multiple crews work parallel activities to the maximum extent possible, consistent with: optimum efficiency; adequate access for cutting, removal and laydown space; and stringent safety measures necessary during demolition of heavy components and structures.

- For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

The period-dependent costs presented in the cost tables in Appendices C and D are based upon the durations developed in the schedule for each decommissioning alternative. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the total costs for these period-dependent items.

Project timelines for the two decommissioning alternatives are included in this section as Figure 4.2a and 4.2b. Milestone dates are based on a 36 and 39-year plant operating life from the start of commercial operations, for Units 1 and 2, respectively, a minimum of 12 years wet storage for the last core discharge of fuel, and a deferral of thirty years for license termination (SAFSTOR) and final site release.

FIGURE 4.1

DECON ACTIVITY SCHEDULE

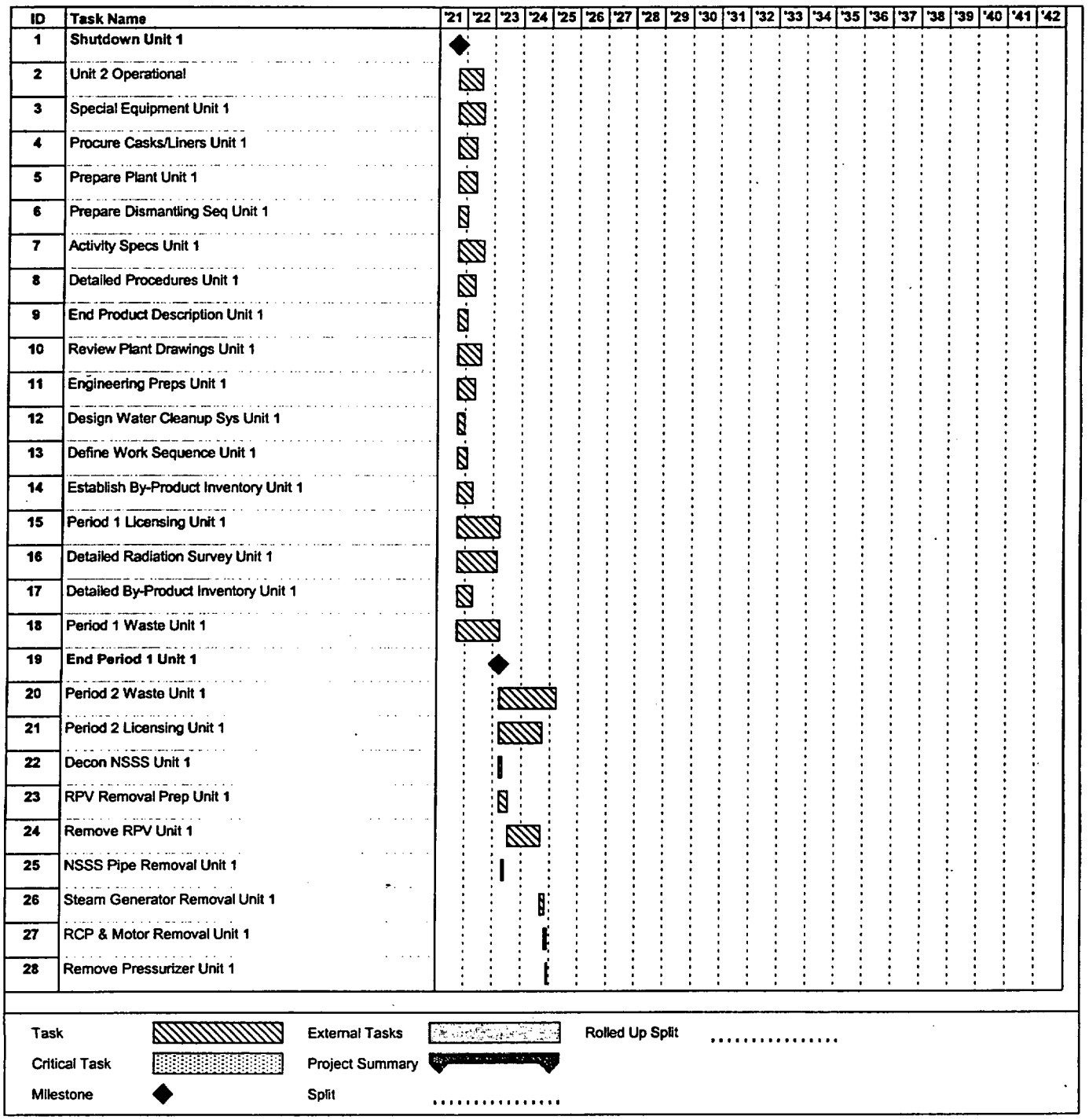


FIGURE 4.1
(Continued)

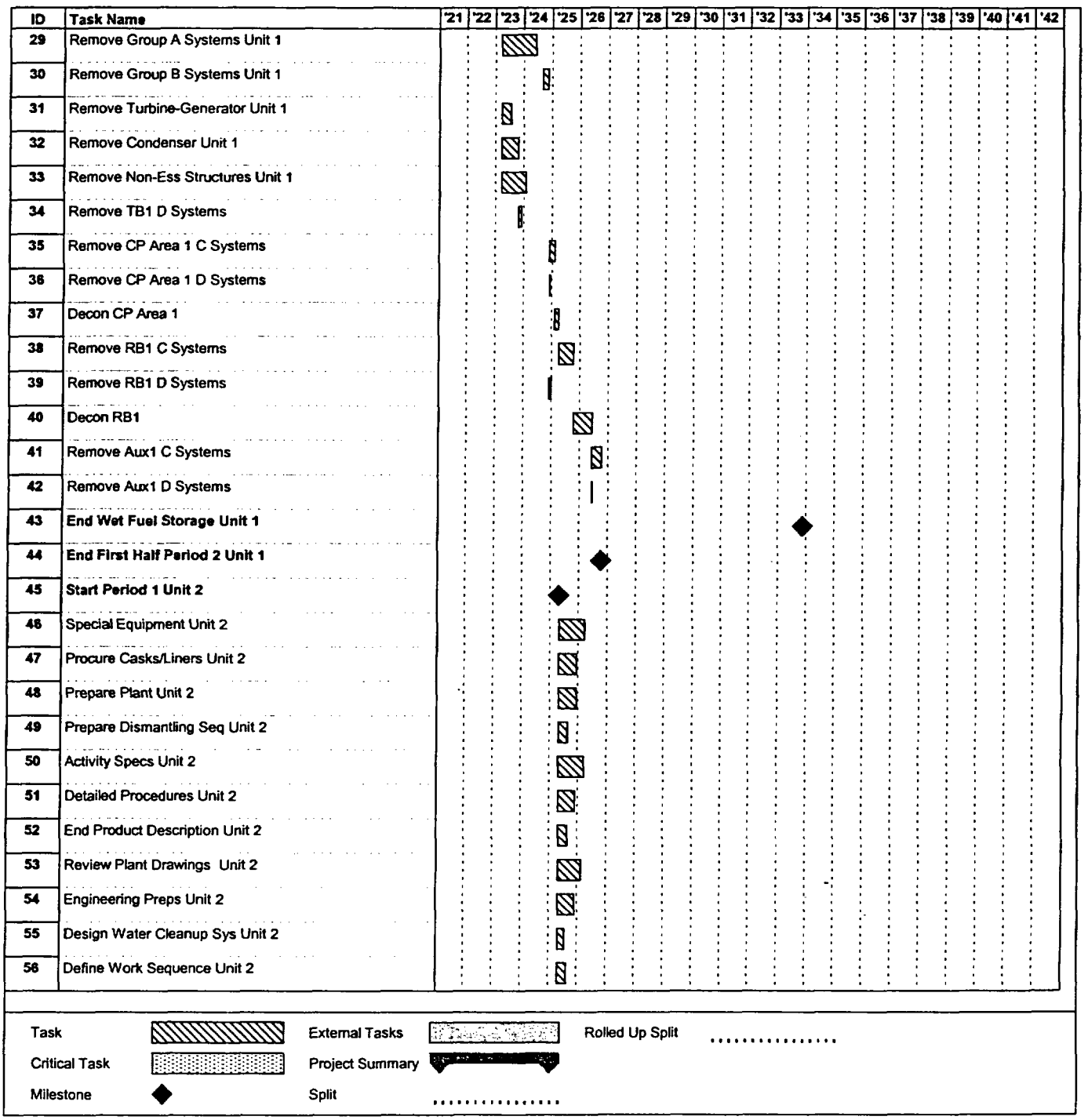


FIGURE 4.1
(Continued)

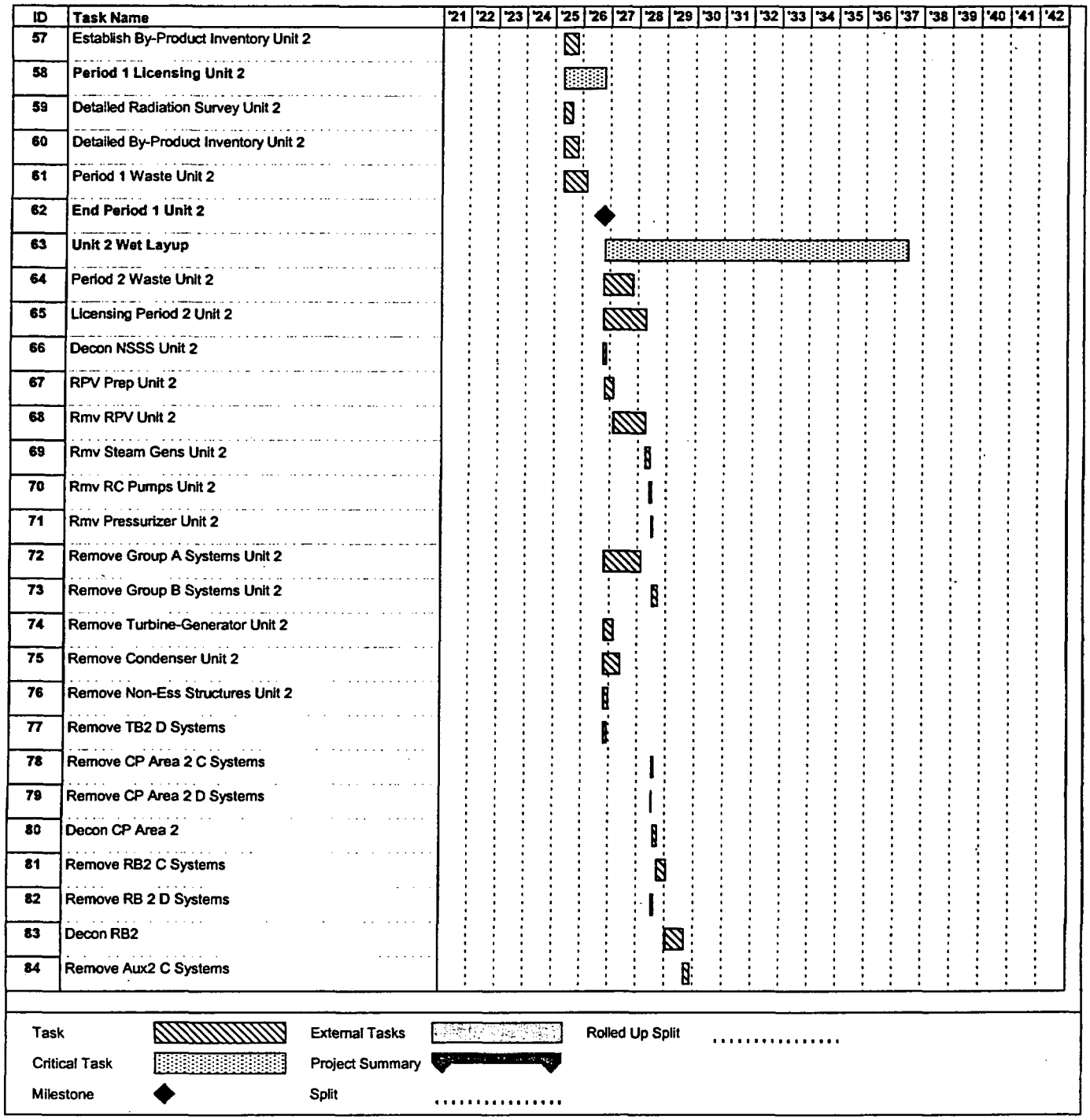


FIGURE 4.1
(Continued)

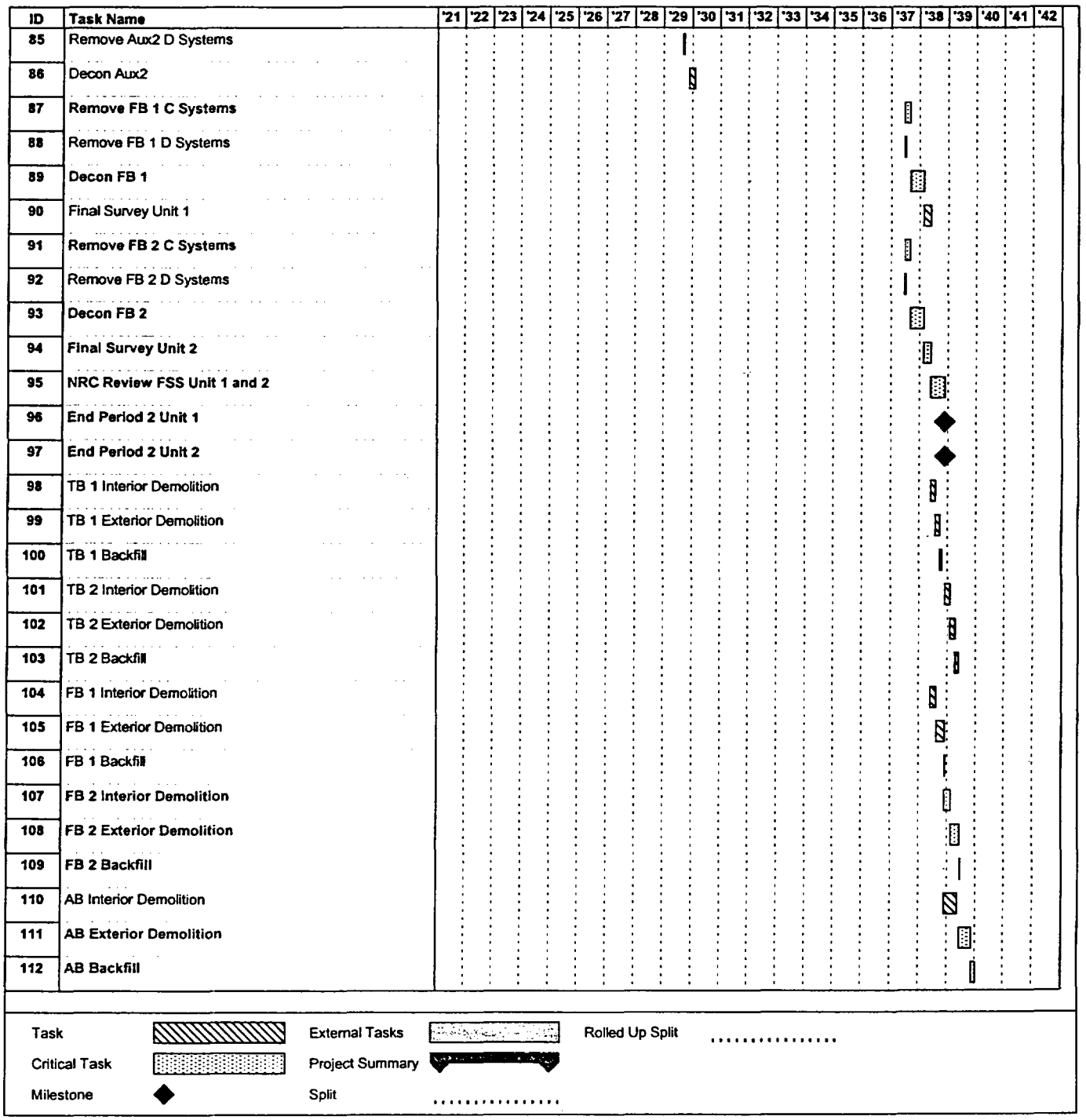


FIGURE 4.1
(Continued)

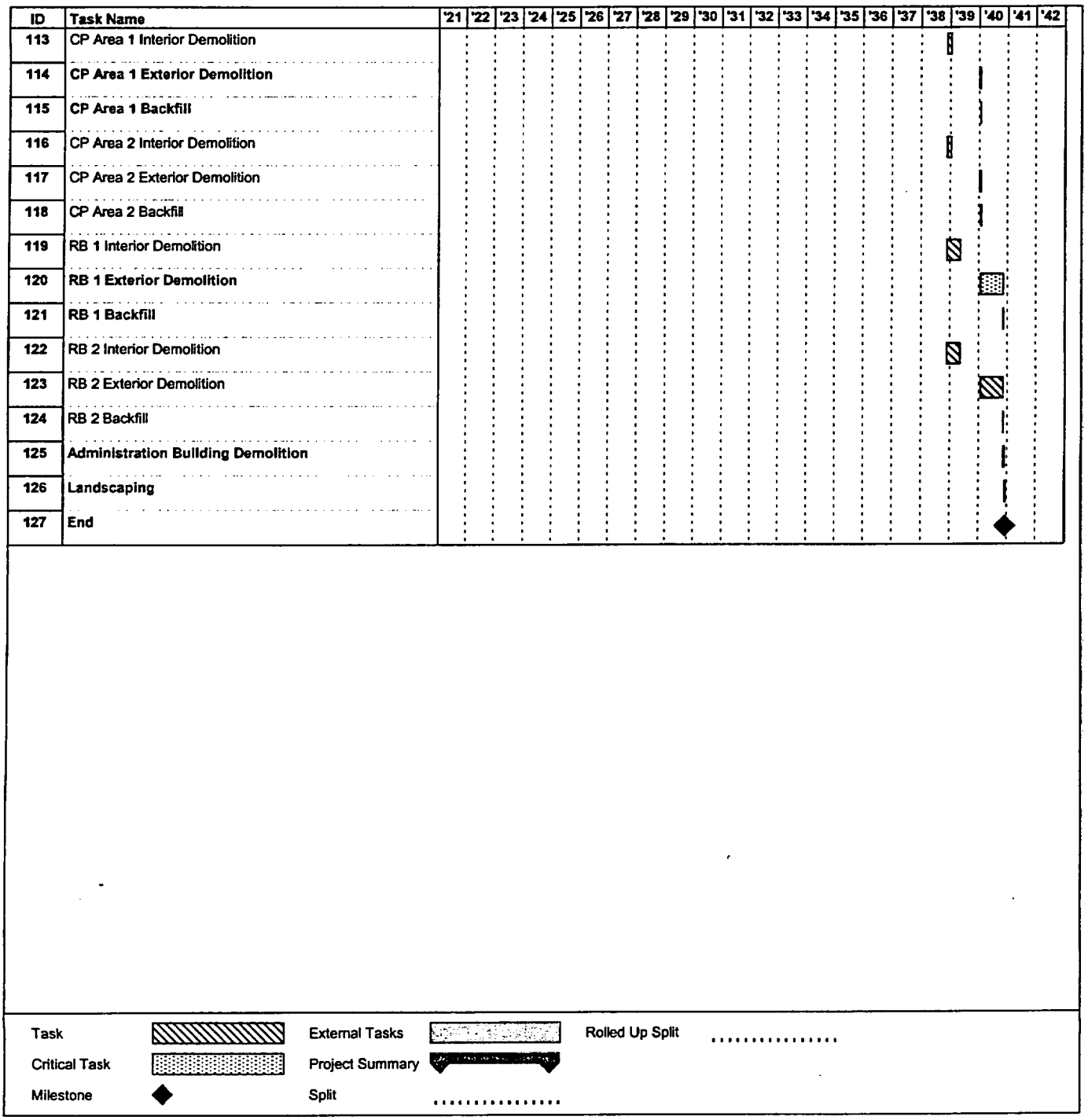
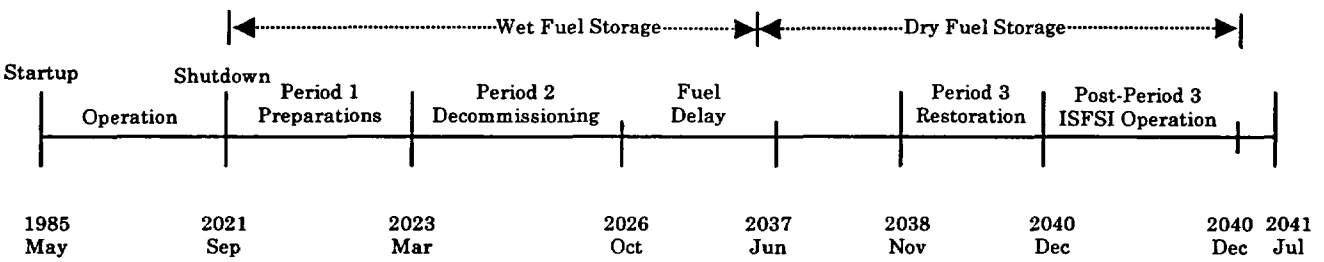


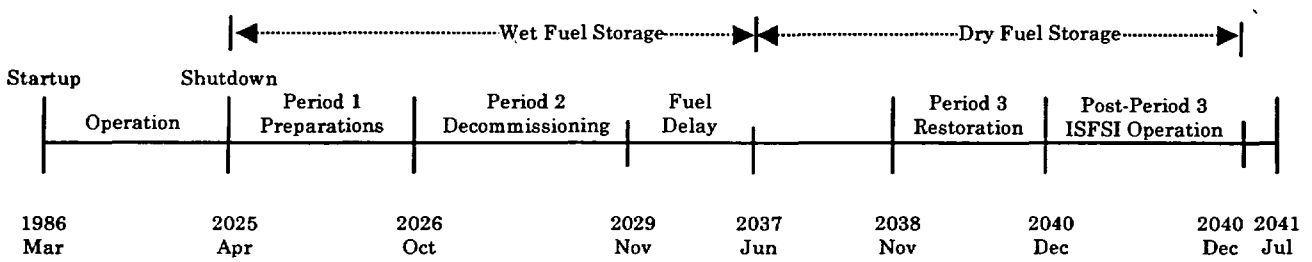
FIGURE 4.2a

DECON DECOMMISSIONING TIMELINES

DCPP UNIT 1



DCPP UNIT 2

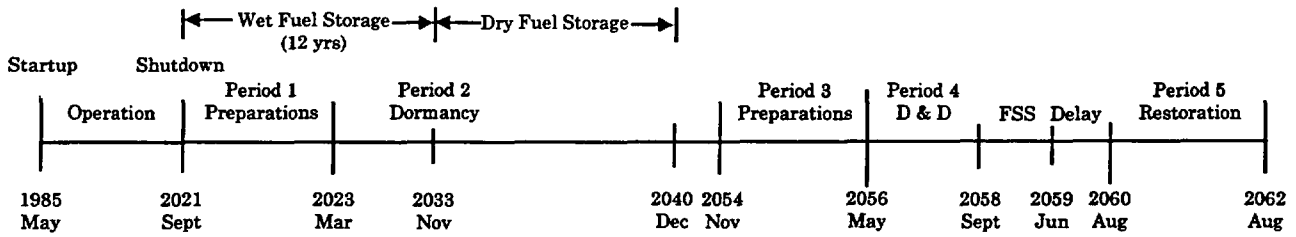


NOT TO SCALE

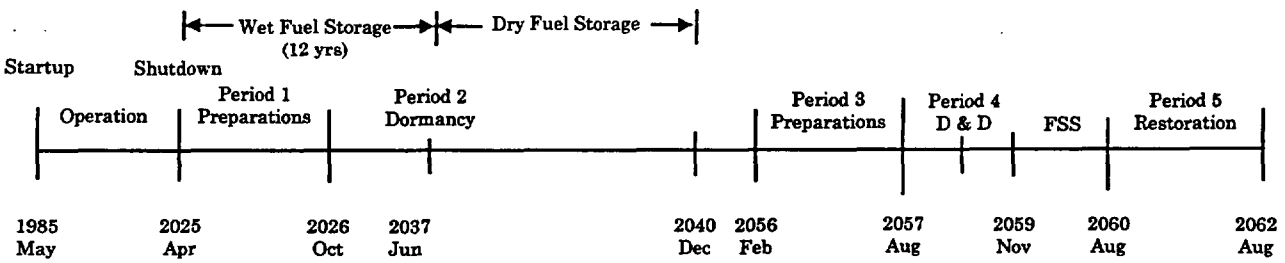
FIGURE 4.2b

SAFSTOR DECOMMISSIONING TIMELINES

DCPP UNIT 1



DCPP UNIT 2



NOT TO SCALE

5. RADIOACTIVE WASTES

The goal of the decommissioning program is the removal of all radioactive material from the site that would restrict its future use, and termination of the NRC license for the site. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act, (Ref. 17) the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, 10 CFR §71 defines radioactive material and 10 CFR §61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR §173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The volumes of radioactive waste generated during the various decommissioning activities at the site are shown on a line-item basis in Appendices C and D and summarized in Table 5.1. The quantified waste volume summaries shown in Table 5.1 are consistent with 10 CFR §61 classifications. The volumes are calculated based on the exterior dimensions for containerized material. The volumes are calculated on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The waste volume generated in the decontamination and dismantling of the nuclear unit is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Contaminated and activated material is characterized on site, with a significant volume shipped to off-site waste processors. Material that is considered potentially contaminated when removed from a Radiological Controlled Area (RCA), is sent to processing facilities for conditioning and disposal. Off-site processing of waste was

estimated on a $2.00 per pound basis, based on average rates from existing licensed waste processors.

For purposes of constructing the decommissioning cost estimates, an assumed unit burial rate of $5.05 per pound was used to calculate the cost for disposal of low-level radioactive waste generated in the decontamination and dismantling of DCPP. This rate is derived from the disposal rates charged at the Barnwell low-level waste disposal facility for non-Atlantic compact generators.

The burial volumes reported in Table 5.1 reflect the savings from recycling and waste conditioning. The cost of processing this material appears as an "other" cost for the systems and plant structures identified in Appendices C and D.

TABLE 5.1

DECOMMISSIONING RADIOACTIVE WASTE BURIAL VOLUMES

	Waste Class[1]	Volume (Cubic feet)
DECON		
Unit 1	A	98,652
	B	16,255
	C	574
	>C	604
Subtotal		**116,085**
Unit 2 & Common	A	107,868
	B	15,272
	C	574
	>C	604
Subtotal		**124,318**
TOTAL		**240,403**
SAFSTOR		
Unit 1	A	93,981
	B	7,051
	C	584
	>C	604
Subtotal		**102,220**
Unit 2 & Common	A	101,957
	B	7,314
	C	584
	>C	604
Subtotal		**110,459**
TOTAL		**212,679**

1 Waste is classified according to the requirements delineated in Title 10 of the Code of Federal Regulations, Part 61.55

6. RESULTS

The projected costs to decommission the Diablo Canyon Power Plant for the DECON alternative are estimated to be $575.8 and $801.3 million in 2002 dollars for Unit 1 and Unit 2, respectively. The projected decommissioning costs for the SAFSTOR alternative are estimated at $583.5 and $779.5 million in 2002 dollars for Unit 1 and Unit 2, respectively. The costs reflect the site-specific features of DCPP, the local cost of labor, interim storage of spent fuel in an on-site ISFSI, and disposal of low-level radioactive waste at the Southwest Compact's future disposal site. An analysis of the major activities contributing to the total cost for the DECON and SAFSTOR decommissioning alternatives are provided in Tables 6.1 and 6.2, respectively. Appendix C contains a detailed list of costs by "activity description" for each unit for the DECON alternative. Appendix D contains a similar list of costs for the SAFSTOR alternative.

The principal cost drivers in decommissioning the plant include labor-related costs, waste management costs, spent fuel management costs, and other costs necessary to complete the project. Staffing represents the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning as well as the duration of the program, including the time associated with the onsite caretaking of the spent fuel while DOE completes the transfer.

The cost to process and dispose of the low-level radioactive waste generated in the decontamination and dismantling of the nuclear units represents the next largest cost component. The cost includes the conditioning and treatment of a significant portion of the metallic waste at off-site processing centers to reduce the volume of material requiring controlled disposal as well as the cost to dispose of the remaining material at a regional disposal facility. The disposal cost is indicative of the expense incurred in siting, developing, and licensing new disposal facilities.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component which is based upon prevailing union wages.

Spent fuel management includes capital expenditures for the loading of the spent fuel assemblies into dry storage/transport containers, transfer of the containers to the onsite storage facility, as well as the eventual unloading of the storage cask and transfer of the inner containers to the DOE. Operational and maintenance costs are included in the value reported, as well as associated equipments costs and licensing fees.

Transport costs (shipping) are reported for only that portion of the radioactive waste stream requiring controlled disposal at the regional site. Transport costs for the material designed for off-site treatment are inclusive within the processing fees charged by the vendors and are included within the Burial or Recycling cost component. The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland as well as the general expense of transporting, e.g., labor and fuel, material over a distance of 1,000 miles. Finally, "Other" costs include engineering costs, energy, necessary insurance, and fees.

This study provides estimates for decommissioning under current requirements, based on present-day costs and available technology. Decommissioning requirements and assumptions may change. Individual costs associated with decommissioning have, historically, increased at rates greater than that of general inflation. The US DOE spent fuel acceptance schedule is subject to change, which may impact the decommissioning schedule. The availability and cost of low-level waste disposal sites is subject to change, which would also impact the decommissioning costs. It is therefore appropriate that this cost study be reviewed periodically and revised as needed.

TABLE 6.1

SUMMARY OF DECON DECOMMISSIONING COST CONTRIBUTORS

Work Category	Costs 02$ (thousands)[1]	Percent of Total Costs[1]
Unit 1		
Decontamination	15,820	2.7
Removal	87,382	15.2
Packaging	12,939	2.2
Shipping	4,847	0.8
Burial or Recycling (Off Site)	125,518	21.8
Decommissioning Staffs	216,926	37.7
Spent Fuel Management	56,555	9.8
Other[2]	55,857	9.7
Subtotal	**575,844**	**100.0**
Unit 2 & Common		
Decontamination	17,738	2.2
Removal	118,997	14.9
Packaging	12,890	1.6
Shipping	4,814	0.6
Burial or Recycling (Off Site)	125,670	15.7
Decommissioning Staffs	242,727	30.3
Breakwater Removal	165,533	20.7
Spent Fuel Management	56,555	7.1
Other[2]	56,397	7.0
Subtotal	**801,321**	**100.0**
Station Total (with contingency)	**1,377,165**	

1. Columns may not add due to rounding.
2. Other includes engineering & preparations, undistributed costs, NRC Fees, EP Fees and Maintenance Costs, etc.

TABLE 6.2

SUMMARY OF SAFSTOR DECOMMISSIONING COST CONTRIBUTORS

Work Category	Costs 02$ (thousands)[1]	Percent of Total Costs[1]
Unit 1		
Decontamination	10,500	1.8
Removal	81,960	14.0
Packaging	11,322	1.9
Shipping	3,112	0.5
Burial or Recycling (Off Site)	111,620	19.1
Decommissioning Staffs	242,806	41.6
Spent Fuel Management	56,555	9.7
Other[2]	65,575	11.2
Subtotal	**583,451**	**100.0**
Unit 2 & Common		
Decontamination	15,026	1.9
Removal	114,523	14.7
Packaging	11,440	1.5
Shipping	3,180	0.4
Burial or Recycling (Off Site)	114,897	14.7
Decommissioning Staffs	231,998	29.8
Breakwater Removal	165,533	21.2
Spent Fuel Management	56,555	7.3
Other[2]	66,392	8.5
Subtotal	**779,543**	**100.0**
Station Total (with contingency)	**1,362,994**	

1. Columns may not add due to rounding.
2. Other includes engineering & preparations, undistributed costs, NRC Fees, EP Fees and Maintenance Costs, etc.

7. REFERENCES

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16. "Microsoft Project 98," Microsoft Corporation, Redmond, WA, 1997.

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APPENDIX A

UNIT COST FACTOR DEVELOPMENT

APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the packing area.

2. CALCULATIONS

Activity Description	Critical Duration (minutes)
Install contamination controls, remove insulation, and mount pipe cutters	60
Disconnect inlet and outlet lines, cap openings	60
Rig for removal	30
Unbolt from mounts	30
Remove contamination controls	15
Remove heat exchanger, wrap in plastic, and send to packing area	60
Critical Duration	255

Work Adjustments (Work Difficulty Factors)

+ Respiratory Protection (50% of Critical Duration)	128
+ Radiation/ALARA (37% of Critical Duration)	95
Adjusted Work Duration	478
+ Protective Clothing (30% of Adjusted Work Duration)	143
Productive Work Duration	621
+ Work break adjustment (8.33 % of Productive Work Duration)	52
Total Work Duration	673

***** Total Work Duration = 673 minutes or 11.217 hours *****

APPENDIX A
(continued)

3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate ($/hr)	Cost
Laborers	3.00	11.217	$36.88	$1,241.05
Craftsmen	2.00	11.217	$48.00	$1,076.83
Foreman	1.00	11.217	$51.24	$574.76
General Foreman	0.25	11.217	$54.26	$152.16
Fire Watch	0.05	11.217	$36.88	$20.68
Health Physics Technician	1.00	11.217	$34.14	$382.95
Total labor cost				$3,448.43

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Gas torch consumables 1 @ $4.61/hr x 1 hr {1}	$4.61
-Blotting paper 50 @ $0.48 sq ft {2}	$24.00
-Plastic sheets/bags 50 @ $0.12/sq ft {3}	$6.00
Subtotal cost of equipment and materials	$34.61
Overhead & sales tax on equipment and materials @ 15.00%	$5.88
Total costs, equipment & material	$40.49
TOTAL COST: Removal of contaminated heat exchanger <3000 pounds:	**$3,488.92**
Total labor cost:	$3,488.92
Total equipment/material costs:	$40.49
Total adjusted exposure man-hours incurred:	46.247
Total craft labor man-hours required per unit:	81.884

APPENDIX A
(continued)

5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the AIF (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

- References for equipment & consumables costs:

    1. R.S. Means (2002) Division 016 Section 420-6360 pg 23
    2. McMaster-Carr Ed. 105
    3. R.S. Means (2002) Division 015 Section 602-0200 pg 17

- Material and consumable costs were adjusted using the regional indices for San Luis Obispo, California.

APPENDIX B

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean instrument and sampling tubing, $/linear foot	$0.41
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	$4.30
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	$6.15
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	$12.00
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	$23.19
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	$30.03
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	$44.21
Removal of clean pipe >36 inches diameter, $/linear foot	$52.59
Removal of clean valves >2 to 4 inches	$79.88
Removal of clean valves >4 to 8 inches	$120.01
Removal of clean valves >8 to 14 inches	$231.90
Removal of clean valves >14 to 20 inches	$300.32
Removal of clean valves >20 to 36 inches	$442.15
Removal of clean valves >36 inches	$525.88
Removal of clean pipe hangers for small bore piping	$25.14
Removal of clean pipe hangers for large bore piping	$92.94
Removal of clean pumps, <300 pound	$199.91
Removal of clean pumps, 300-1000 pound	$557.88
Removal of clean pumps, 1000-10,000 pound	$2,219.95
Removal of clean pumps, >10,000 pound	$4,284.48
Removal of clean pump motors, 300-1000 pound	$235.93
Removal of clean pump motors, 1000-10,000 pound	$926.44
Removal of clean pump motors, >10,000 pound	$2,084.50
Removal of clean turbine-driven pumps < 10,000 pound	$2,560.20
Removal of clean turbine-driven pumps > 10,000 pounds	$5,742.59

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit($)
Removal of clean PWR turbine-generator	$136,365.50
Removal of clean heat exchanger <3000 pound	$1,189.55
Removal of clean heat exchanger >3000 pound	$2,982.11
Removal of clean feedwater heater/deaerator	$8,424.31
Removal of clean moisture separator/reheater	$17,343.63
Removal of clean PWR main condenser	$377,985.88
Removal of clean tanks, <300 gallons	$257.46
Removal of clean tanks, 300-3000 gallon	$816.62
Removal of clean tanks, >3000 gallons, $/square foot surface area	$6.81
Removal of clean electrical equipment, <300 pound	$110.54
Removal of clean electrical equipment, 300-1000 pound	$384.11
Removal of clean electrical equipment, 1000-10,000 pound	$768.22
Removal of clean electrical equipment, >10,000 pound	$1,829.61
Removal of clean electrical transformers < 30 tons	$1,270.64
Removal of clean electrical transformers > 30 tons	$3,659.21
Removal of clean standby diesel-generator, <100 kW	$1,297.85
Removal of clean standby diesel-generator, 100 kW to 1 MW	$2,896.88
Removal of clean standby diesel-generator, >1 MW	$5,997.12
Removal of clean electrical cable tray, $/linear foot	$10.23
Removal of clean electrical conduit, $/linear foot	$4.46
Removal of clean mechanical equipment, <300 pound	$110.54
Removal of clean mechanical equipment, 300-1000 pound	$384.11
Removal of clean mechanical equipment, 1000-10,000 pound	$768.22
Removal of clean mechanical equipment, >10,000 pound	$1,829.61
Removal of clean HVAC equipment, <300 pound	$110.54

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit($)
Removal of clean HVAC equipment, 300-1000 pound	$384.11
Removal of clean HVAC equipment, 1000-10,000 pound	$768.22
Removal of clean HVAC equipment, >10,000 pound	$1,829.61
Removal of clean HVAC ductwork, $/pound	$0.43
Removal of contaminated instrument and sampling tubing, $/linear foot	$1.20
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	$29.67
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	$54.42
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	$86.95
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	$173.61
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	$210.12
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	$294.21
Removal of contaminated pipe >36 inches diameter, $/linear foot	$349.42
Removal of contaminated valves >2 to 4 inches	$349.46
Removal of contaminated valves >4 to 8 inches	$420.45
Removal of contaminated valves >8 to 14 inches	$868.05
Removal of contaminated valves >14 to 20 inches	$1,103.48
Removal of contaminated valves >20 to 36 inches	$1,471.03
Removal of contaminated valves >36 inches	$1,747.09
Removal of contaminated pipe hangers for small bore piping	$82.79
Removal of contaminated pipe hangers for large bore piping	$278.04
Removal of contaminated pumps, <300 pound	$747.16
Removal of contaminated pumps, 300-1000 pound	$1,744.86
Removal of contaminated pumps, 1000-10,000 pound	$5,790.35
Removal of contaminated pumps, >10,000 pound	$14,101.10
Removal of contaminated pump motors, 300-1000 pound	$739.64

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated pump motors, 1000-10,000 pound	$2,354.42
Removal of contaminated pump motors, >10,000 pound	$5,285.92
Removal of contaminated turbine-driven pumps < 10,000 pounds	$7,137.15
Removal of contaminated turbine-driven pumps > 10,000 pounds	$16,293.15
Removal of contaminated heat exchanger <3000 pound	$3,488.92
Removal of contaminated heat exchanger >3000 pound	$10,090.49
Removal of contaminated tanks, <300 gallons	$1,242.29
Removal of contaminated tanks, >300 gallons, $/square foot	$24.53
Removal of contaminated electrical equipment, <300 pound	$581.04
Removal of contaminated electrical equipment, 300-1000 pound	$1,416.02
Removal of contaminated electrical equipment, 1000-10,000 pound	$2,725.95
Removal of contaminated electrical equipment, >10,000 pound	$5,354.82
Removal of contaminated electrical cable tray, $/linear foot	$27.92
Removal of contaminated electrical conduit, $/linear foot	$24.86
Removal of contaminated mechanical equipment, <300 pound	$646.95
Removal of contaminated mechanical equipment, 300-1000 pound	$1,565.84
Removal of contaminated mechanical equipment, 1000-10,000 pound	$3,009.50
Removal of contaminated mechanical equipment, >10,000 pound	$5,354.82
Removal of contaminated HVAC equipment, <300 pound	$646.95
Removal of contaminated HVAC equipment, 300-1000 pound	$1,565.85
Removal of contaminated HVAC equipment, 1000-10,000 pound	$3,009.50
Removal of contaminated HVAC equipment, >10,000 pound	$5,354.82
Removal of contaminated HVAC ductwork, $/pound	$2.64
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	$3.14
Additional decontamination of surface by washing, $/square foot	$6.44

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit($)
Additional decontamination of surfaces by hydrolasing, $/square foot	$28.35
Decontamination rig hook-up and flush	$5,495.23
Chemical flush of components/systems, $/gallon	$11.64
Removal of clean standard reinforced concrete, $/cubic yard	$65.02
Removal of grade slab concrete, $/cubic yard	$188.98
Removal of clean concrete floors, $/cubic yard	$290.00
Removal of sections of clean concrete floors, $/cubic yard	$854.92
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	$196.39
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	$1,677.08
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	$248.37
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	$2,220.36
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cu yd	$372.62
Removal of below-grade suspended floors, $/square foot	$290.00
Removal of clean monolithic concrete structures, $/cubic yard	$718.84
Removal of contaminated monolithic concrete structures, $/cu yd	$1,676.99
Removal of clean foundation concrete, $/cubic yard	$562.48
Removal of contaminated foundation concrete, $/cubic yard	$1,561.85
Explosive demolition of bulk concrete, $/cubic yard	$25.52
Removal of clean hollow masonry block wall, $/cubic yard	$71.07
Removal of contaminated hollow masonry block wall, $/cubic yard	$224.02
Removal of clean solid masonry block wall, $/cubic yard	$71.07
Removal of contaminated solid masonry block wall, $/cubic yard	$224.02
Backfill of below-grade voids, $/cubic yard	$17.11
Removal of subterranean tunnels/voids, $/linear foot	$127.27
Placement of concrete for below-grade voids, $/cubic yard	$99.68

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit($)
Excavation of clean material, $/cubic yard	$2.94
Excavation of contaminated material, $/cubic yard	$33.84
Excavation of submerged concrete rubble, $/cubic yard	$11.76
Removal of clean concrete rubble, $/cubic yard	$80.13
Removal of contaminated concrete rubble, $/cubic yard	$27.05
Removal of building by volume, $/cubic foot	$0.24
Removal of clean building metal siding, $/square foot	$1.21
Removal of contaminated building metal siding, $/square foot	$3.76
Removal of standard asphalt roofing, $/square foot	$1.91
Removal of transite panels, $/square foot	$2.02
Scarifying contaminated concrete surfaces (drill & spall)	$11.44
Scabbling contaminated concrete floors, $/square foot	$6.70
Scabbling contaminated concrete walls, $/square foot	$7.37
Scabbling contaminated ceilings, $/square foot	$66.29
Scabbling structural steel, $/square foot	$5.53
Removal of clean overhead cranes/monorails < 10 ton capacity	$537.17
Removal of contaminated overhead cranes/monorails < 10 ton capacity	$1,455.78
Removal of clean overhead cranes/monorails >10-50 ton capacity	$1,289.20
Removal of contaminated overhead cranes/monorails >10-50 ton capacity	$3,493.29
Removal of polar cranes > 50 ton capacity, each	$5,396.79
Removal of gantry cranes > 50 ton capacity, each	$22,870.09
Removal of structural steel, $/pound	$0.32
Removal of clean steel floor grating, $/square foot	$2.81
Removal of contaminated steel floor grating, $/square foot	$8.27
Removal of clean free-standing steel liner, $/square foot	$10.21

APPENDIX B
(continued)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated free-standing steel liner, $/square foot	$28.70
Removal of clean concrete-anchored steel liner, $/square foot	$5.10
Removal of contaminated concrete-anchored steel liner, $/square foot	$33.42
Placement of scaffolding in clean areas, $/square foot	$13.52
Placement of scaffolding in contaminated areas, $/square foot	$20.61
Landscaping w/o topsoil, $/acre	$1,091.62
Cost of CPC B-88 LSA box & preparation for use	$1,538.13
Cost of CPC B-25 LSA box & preparation for use	$1,403.24
Cost of CPC B-12V 12 gauge LSA box & preparation for use	$1,248.32
Cost of CPC B-144 LSA box & preparation for use	$5,723.96
Cost of LSA drum & preparation for use	$123.45
Cost of cask liner for CNSI 14-195 cask	$9,438.75
Cost of cask liner for CNSI 8-120A cask (resins)	$6,466.95
Cost of cask liner for CNSI 8-120A cask (filters)	$6,466.95
Decontamination of surfaces with vacuuming, $/square foot	$0.60

APPENDIX C

DETAILED COST ANALYSES - DECON

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 1																
1	Prepare preliminary decommissioning cost	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
2	Notification of Cessation of Operations	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
3	Remove fuel & source material	-	-	-	-	-	-	-	Note 2	-	-	-	-	-	-	-
4	Notification of Permanent Defueling	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
6	Prepare and submit PSDAR	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
7	Review plant dwgs & specs.	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
8	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
9	Estimate by-product inventory	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
10	End product description	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
11	Detailed by-product inventory	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
12	Define major work sequence	-	-	-	-	-	600	90	690	690	-	-	-	-	-	-
13	Perform SER and EA	-	-	-	-	-	248	37	285	285	-	-	-	-	-	-
14	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-
15	Prepare/submit License Termination Plan	-	-	-	-	-	328	49	377	377	-	-	-	-	-	-
16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
Activity Specifications																
17.1	Plant & temporary facilities	-	-	-	-	-	394	59	453	407	45	-	-	-	-	-
17.2	Plant systems	-	-	-	-	-	333	50	383	345	38	-	-	-	-	-
17.3	NSSS Decontamination Flush	-	-	-	-	-	40	6	46	46	-	-	-	-	-	-
17.4	Reactor internals	-	-	-	-	-	568	85	653	653	-	-	-	-	-	-
17.5	Reactor vessel	-	-	-	-	-	520	78	598	598	-	-	-	-	-	-
17.6	Biological shield	-	-	-	-	-	40	6	46	46	-	-	-	-	-	-
17.7	Steam generators	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-
17.8	Reinforced concrete	-	-	-	-	-	128	19	147	74	74	-	-	-	-	-
17.9	Turbine & condenser	-	-	-	-	-	64	10	74	-	74	-	-	-	-	-
17.10	Plant structures & buildings	-	-	-	-	-	250	37	287	143	143	-	-	-	-	-
17.11	Waste management	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
17.12	Facility & site closeout	-	-	-	-	-	72	11	83	41	41	-	-	-	-	-
17	Total	-	-	-	-	-	3,025	454	3,479	3,064	416	-	-	-	-	-
Planning & Site Preparations																
18	Prepare dismantling sequence	-	-	-	-	-	192	29	221	221	-	-	-	-	-	-
19	Plant prep. & temp. svces	-	-	-	-	-	2,304	346	2,650	2,650	-	-	-	-	-	-
20	Design water clean-up system	-	-	-	-	-	112	17	129	129	-	-	-	-	-	-
21	Rigging/CCEs/tooling/etc.	-	-	-	-	-	1,950	293	2,243	2,243	-	-	-	-	-	-
22	Procure casks/liners & containers	-	-	-	-	-	98	15	113	113	-	-	-	-	-	-
Detailed Work Procedures																
23.1	Plant systems	-	-	-	-	-	379	57	435	392	44	-	-	-	-	-
23.2	NSSS Decontamination Flush	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.3	Vessel head	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
23.4	Reactor internals	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
23.5	Remaining buildings	-	-	-	-	-	108	16	124	31	93	-	-	-	-	-
23.6	CRD cooling assembly	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.7	CRD housings & ICI lubes	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.8	Incore instrumentation	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.9	Reactor vessel	-	-	-	-	-	290	44	334	334	-	-	-	-	-	-
23.10	Facility closeout	-	-	-	-	-	96	14	110	55	55	-	-	-	-	-
23.11	Missile shields	-	-	-	-	-	36	5	41	41	-	-	-	-	-	-
23.12	Biological shield	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-
23.13	Steam generators	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
23.14	Reinforced concrete	-	-	-	-	-	80	12	92	46	46	-	-	-	-	-
23.15	Turbine & condensers	-	-	-	-	-	250	37	287	-	287	-	-	-	-	-
23.16	Auxiliary building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
23.17	Reactor building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
23	Total	-	-	-	-	-	2,859	429	3,288	2,713	575	-	-	-	-	-
24	Decon primary loop	1,610	-	-	-	-	-	805	2,416	2,416	-	-	-	-	-	800

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Period 1 Additional Costs																
25	Hazardous Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
26	Mixed Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
27	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-
28	Spent Fuel Loading Campaigns	-	-	-	-	-	29	4	34	34	-	-	-	-	-	-
29	Spent Fuel Ops & Maintenance	-	-	-	-	-	25	4	28	28	-	-	-	-	-	-
30	Spent Fuel Fixed Costs	-	-	-	-	-	49	7	56	56	-	-	-	-	-	-
31	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	198	29	225	225	-	-	-	-	-	-
32	Spent Fuel Pool Isolation	-	-	-	-	-	7,577	1,137	8,714	8,714	-	-	-	-	-	-
33	Site Characterization	-	-	-	-	-	1,011	303	1,314	1,314	-	-	-	-	-	12,588
Subtotal Period 1 Activity Costs		1,610	-	-	-	-	23,171	4,432	29,214	28,223	991	-	-	-	-	13,388
Period 1 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	41	-	-	-	-	-	10	52	52	-	-	-	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
4	Process liquid waste	105	-	742	862	3,497	-	1,130	6,336	6,336	-	-	6,656	-	-	333
5	Insurance	-	-	-	-	-	3,564	356	3,920	3,920	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	302	-	-	-	-	76	378	378	-	-	-	-	-	-
8	Heavy equipment rental	-	261	-	-	-	-	39	300	300	-	-	-	-	-	-
9	Small tool allowance	-	12	-	-	-	-	2	14	14	-	-	-	-	-	-
10	Disposal of DAW generated	-	-	590	14	1,412	-	414	2,430	2,430	-	3,496	-	-	-	9,509
11	Plant energy budget	-	-	-	-	-	876	131	1,008	1,008	-	-	-	-	-	-
12	NRC ISFSI Fees	-	-	-	-	-	26	3	28	28	-	-	-	-	-	-
13	NRC Fees	-	-	-	-	-	404	40	445	445	-	-	-	-	-	-
14	Emergency Planning Fees	-	-	-	-	-	76	8	83	83	-	-	-	-	-	-
15	Site Security Cost	-	-	-	-	-	2,215	332	2,547	2,547	-	-	-	-	-	-
Subtotal Undistributed Costs Period 1		834	1,882	1,332	875	4,909	7,161	2,841	19,834	19,834	-	3,496	6,656	-	-	9,842
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	6,340	951	7,291	7,291	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	26,166	3,925	30,091	30,091	-	-	-	-	-	-
TOTAL PERIOD 1 COST		2,445	1,882	1,332	875	4,909	62,838	12,150	86,430	85,440	991	3,496	6,656	-	-	23,230
PERIOD 2																
Nuclear Steam Supply System Removal																
34.1	Reactor Coolant Piping	100	196	8	8	193	-	150	657	657	-	477	-	-	-	6,817
34.2	Pressurizer Relief Tank	25	22	9	8	251	-	83	399	399	-	621	-	-	-	1,080
34.3	Reactor Coolant Pumps & Motors	94	78	39	13	1,836	114	548	2,722	2,722	-	4,546	-	-	-	3,853
34.4	Pressurizer	38	48	362	313	905	-	340	2,006	2,006	-	2,318	-	-	-	1,867
34.5	Steam Generators	326	2,839	1,895	793	11,894	2,485	4,527	24,760	24,760	-	22,200	-	-	-	24,566
34.6	CRDMs/ICIs/Service Structure Removal	71	56	90	22	1,061	-	327	1,628	1,628	-	2,627	-	-	-	2,832
34.7	Reactor Vessel Internals	113	1,148	3,892	677	5,588	-	4,854	16,272	16,272	-	1,502	1,096	574	-	13,118
34.8	Reactor Vessel	81	3,124	677	553	8,069	-	6,726	19,230	19,230	-	6,416	2,379	-	-	33,180
34	Totals	849	7,513	6,973	2,387	29,797	2,599	17,556	67,674	67,674	-	40,707	3,474	574	-	87,312
35	Remove spent fuel racks	357	36	17	2	1,034	337	499	2,283	2,283	-	2,560	-	-	-	9,340
Removal of Major Equipment																
36	Main Turbine/Generator	-	404	-	-	-	712	208	1,323	1,323	-	-	-	-	-	9,206
37	Main Condensers	-	1,191	-	-	-	827	422	2,440	2,440	-	-	-	-	-	27,028

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Disposal of Plant Systems																
38.1	Auxiliary Steam	-	240	-	-	-	361	114	716	716	-	-	-	-	-	5,424
38.2	Auxiliary Steam (RCA)	-	238	-	-	-	189	88	515	515	-	-	-	-	-	5,529
38.3	Capital Additions 85-2002 (clean)	-	120	-	-	-	-	18	137	-	137	-	-	-	-	2,830
38.4	Capital Additions 85-2002 (contaminated)	-	393	3	1	75	154	140	765	765	-	185	-	-	-	9,348
38.5	Chemical & Volume Control	950	895	29	13	821	374	965	4,048	4,048	-	2,033	-	-	-	41,387
38.6	Chemical & Volume Control (Insulated)	473	386	8	4	227	31	396	1,524	1,524	-	562	-	-	-	20,357
38.7	Component Cooling Water	-	128	-	-	-	-	19	147	-	147	-	-	-	-	3,078
38.8	Component Cooling Water (RCA)	-	539	-	-	-	690	238	1,467	1,467	-	-	-	-	-	12,581
38.9	Compressed Air	-	114	-	-	-	-	17	131	-	131	-	-	-	-	2,744
38.10	Compressed Air (Insulated)	-	4	-	-	-	-	1	5	-	5	-	-	-	-	98
38.11	Compressed Air (RCA Insulated)	-	22	-	-	-	8	7	37	37	-	-	-	-	-	517
38.12	Compressed Air (RCA)	-	397	-	-	-	157	123	676	676	-	-	-	-	-	9,314
38.13	Condensate System	-	1,107	-	-	-	3,824	850	5,780	5,780	-	-	-	-	-	25,117
38.14	Condensate System (Insulated)	-	358	-	-	-	1,179	266	1,803	1,803	-	-	-	-	-	8,131
38.15	Containment Spray	-	198	-	-	-	561	134	893	893	-	-	-	-	-	4,622
38.16	Diesel Engine-Generator	-	118	-	-	-	-	18	136	-	136	-	-	-	-	2,760
38.17	Diesel Engine-Generator (Insulated)	-	7	-	-	-	-	1	8	-	8	-	-	-	-	178
38.18	Electrical (Clean)	-	1,407	-	-	-	-	211	1,618	-	1,618	-	-	-	-	32,770
38.19	Electrical (Contaminated)	-	643	2	1	100	398	246	1,390	1,390	-	247	-	-	-	15,307
38.20	Electrical (Contaminated) - FHB	-	193	0	0	9	61	60	323	323	-	22	-	-	-	4,608
38.21	Electrical (Decontaminated)	-	3,895	-	-	-	3,955	1,567	9,417	9,417	-	-	-	-	-	91,243
38.22	Electrical (Decontaminated) - FHB	-	1,171	-	-	-	585	380	2,136	2,136	-	-	-	-	-	27,474
38.23	Extraction Steam & Heater Drip	-	475	-	-	-	926	258	1,658	1,658	-	-	-	-	-	10,874
38.24	Feedwater System	-	53	-	-	-	311	60	424	424	-	-	-	-	-	1,212
38.25	Feedwater System (Insulated)	-	284	-	-	-	649	168	1,102	1,102	-	-	-	-	-	6,532
38.26	Feedwater System (RCA Insulated)	-	111	-	-	-	156	51	319	319	-	-	-	-	-	2,624
38.27	Feedwater System (RCA)	-	5	-	-	-	8	3	16	16	-	-	-	-	-	123
38.28	Fire Protection	-	260	-	-	-	599	155	1,013	1,013	-	-	-	-	-	5,914
38.29	Fire Protection (RCA)	-	195	-	-	-	128	68	390	390	-	-	-	-	-	4,482
38.30	Gaseous Radwaste	-	78	1	1	39	11	31	161	161	-	97	-	-	-	1,821
38.31	HVAC (Clean Insulated)	-	19	-	-	-	-	3	21	-	21	-	-	-	-	475
38.32	HVAC (Clean)	-	235	-	-	-	-	35	270	-	270	-	-	-	-	5,804
38.33	HVAC (Contaminated Insulated)	-	293	2	1	43	222	117	677	677	-	108	-	-	-	6,142
38.34	HVAC (Contaminated)	-	1,253	9	4	265	1,088	544	3,163	3,163	-	655	-	-	-	26,507
38.35	HVAC (Contaminated) - FHB	-	301	2	1	52	252	126	734	734	-	129	-	-	-	6,346
38.36	Liquid Radwaste	665	587	23	10	627	135	660	2,707	2,707	-	1,552	-	-	-	29,056
38.37	Liquid Radwaste (Insulated)	91	72	2	1	49	4	77	296	296	-	122	-	-	-	3,870
38.38	Lube Oil Distribution & Purification	-	173	-	-	-	161	67	401	401	-	-	-	-	-	3,879
38.39	Make-up Water	-	236	-	-	-	-	35	271	-	271	-	-	-	-	5,614
38.40	Make-up Water (Insulated)	-	21	-	-	-	-	3	24	-	24	-	-	-	-	521
38.41	Make-up Water (RCA Insulated)	-	36	-	-	-	22	12	70	70	-	-	-	-	-	833
38.42	Make-up Water (RCA)	-	186	-	-	-	124	65	375	375	-	-	-	-	-	4,307
38.43	Miscellaneous Reactor Coolant	13	74	1	1	43	23	39	194	194	-	106	-	-	-	1,927
38.44	Nitrogen & Hydrogen	-	13	-	-	-	-	2	15	-	15	-	-	-	-	315
38.45	Nitrogen & Hydrogen (Insulated)	-	1	-	-	-	-	0	1	-	1	-	-	-	-	17
38.46	Nitrogen & Hydrogen (RCA Insulated)	-	5	-	-	-	2	1	7	7	-	-	-	-	-	106
38.47	Nitrogen & Hydrogen (RCA)	-	86	-	-	-	30	26	142	142	-	-	-	-	-	2,009
38.48	Nuclear Steam Supply Sampling	-	115	2	1	50	24	45	237	237	-	124	-	-	-	2,866
38.49	Nuclear Steam Supply Sampling (Insulated	-	35	0	0	12	1	12	60	60	-	29	-	-	-	895
38.50	Oily Water Separator & TB Sump	-	30	-	-	-	49	15	95	95	-	-	-	-	-	672
38.51	Residual Heat Removal	254	274	30	14	849	244	449	2,113	2,113	-	2,101	-	-	-	9,116
38.52	Safety Injection	-	94	2	1	44	60	44	244	244	-	110	-	-	-	2,207
38.53	Safety Injection (Insulated)	-	6	0	0	3	2	2	13	13	-	7	-	-	-	136
38.54	Safety Injection (RCA Insulated)	-	37	1	0	24	18	18	99	99	-	60	-	-	-	873
38.55	Safety Injection (RCA)	-	309	8	4	218	162	158	858	858	-	541	-	-	-	7,165
38.56	Saltwater System	-	127	-	-	-	-	19	146	-	146	-	-	-	-	2,926
38.57	Service Cooling Water	-	77	-	-	-	-	12	88	-	88	-	-	-	-	1,856
38.58	Service Cooling Water (RCA)	-	24	-	-	-	21	9	54	54	-	-	-	-	-	560
38.59	Spent Fuel Pit Cooling	-	64	11	5	318	92	111	601	601	-	786	-	-	-	1,537
38.60	Spent Fuel Pit Cooling - FHB	-	90	12	6	341	98	124	670	670	-	843	-	-	-	2,145
38.61	Turbine Steam Supply	-	1,127	-	-	-	4,522	960	6,609	6,609	-	-	-	-	-	25,947

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Disposal of Plant Systems (cont.)																
38.62	Turbine Steam Supply (RCA)	-	778	-	-	-	1,178	371	2,328	2,328	-	-	-	-	-	16,372
38.63	Turbine and Generator	-	101	-	-	-	236	61	398	398	-	-	-	-	-	2,272
38.64	Turbine and Generator (Insulated)	-	51	-	-	-	49	20	121	121	-	-	-	-	-	1,150
38	Totals	2,446	20,960	147	67	4,209	24,130	10,897	62,857	59,838	3,019	10,419	-	-	-	537,425
39	Erect scaffolding for systems removal	-	4,239	2	1	50	132	1,092	5,516	5,516	-	124	-	-	-	39,804
Decontamination of Site Buildings																
40.1	Reactor	1,253	1,115	372	180	10,197	427	3,583	17,126	17,126	-	25,241	-	-	-	51,629
40.2	Capital Additions 85-2002	20	14	4	2	113	-	42	195	195	-	280	-	-	-	803
40.3	Containment Penetration Area	273	41	24	11	651	95	328	1,422	1,422	-	1,611	-	-	-	6,852
40.4	Fuel Handling	613	383	31	15	841	260	657	2,799	2,799	-	2,081	-	-	-	22,200
40	Totals	2,158	1,553	431	208	11,802	781	4,609	21,542	21,542	-	29,213	-	-	-	81,483
41	License Termination Survey	-	-	-	-	-	5,592	1,678	7,270	7,270	-	-	-	-	-	129,465
42	ORISE confirmatory survey	-	-	-	-	-	105	32	137	137	-	-	-	-	-	-
43	Terminate license	-	-	-	-	-	-	-	note 2	-	-	-	-	-	-	-
Period 2 Additional Costs																
44	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	34,237	5,136	39,373	39,373	-	-	-	-	-	-
45	Spent Fuel Loading Campaigns	-	-	-	-	-	3,927	589	4,516	4,516	-	-	-	-	-	-
46	Spent Fuel Ops & Maintenance	-	-	-	-	-	1,636	245	1,881	1,881	-	-	-	-	-	-
47	Spent Fuel Fixed Costs	-	-	-	-	-	3,271	491	3,762	3,762	-	-	-	-	-	-
48	Spent Fuel Security	-	-	-	-	-	277	42	319	319	-	-	-	-	-	-
49	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	1,423	213	1,637	1,637	-	-	-	-	-	-
Period 2 Additional Costs		5,811	35,895	7,571	2,665	46,892	79,988	43,708	222,530	219,512	3,019	83,022	3,474	574	-	921,063
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	773	-	-	-	-	-	193	966	966	-	-	-	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
4	Process liquid waste	380	-	277	519	1,666	-	712	3,554	3,554	-	-	4,125	-	-	545
5	Insurance	-	-	-	-	-	2,705	270	2,975	2,975	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	3,902	-	-	-	-	975	4,877	4,877	-	-	-	-	-	-
8	Heavy equipment rental	-	8,874	-	-	-	-	1,331	10,205	9,184	1,020	-	-	-	-	-
9	Small tool allowance	-	604	-	-	-	-	91	694	625	69	-	-	-	-	-
10	Pipe cutting equipment	-	911	-	-	-	-	137	1,048	1,048	-	-	-	-	-	-
11	Decon rig	1,184	-	-	-	-	-	178	1,362	1,362	-	-	-	-	-	-
12	Disposal of DAW generated	-	-	1,952	45	4,671	-	1,370	8,037	8,037	-	11,562	-	-	-	31,448
13	Decommissioning Equipment Disposition	-	-	8	4	231	480	131	855	855	-	572	-	-	-	778
14	Plant energy budget	-	-	-	-	-	5,493	824	6,317	5,685	632	-	-	-	-	-
15	NRC ISFSI Fees	-	-	-	-	-	1,710	171	1,881	1,881	-	-	-	-	-	-
16	NRC Fees	-	-	-	-	-	3,466	347	3,813	3,813	-	-	-	-	-	-
17	Emergency Planning Fees	-	-	-	-	-	791	79	871	871	-	-	-	-	-	-
18	Site Security Cost	-	-	-	-	-	13,918	2,088	16,005	16,005	-	-	-	-	-	-
19	LLRW Processing Equipment	-	-	-	-	-	1,516	227	1,743	1,743	-	-	-	-	-	-
Subtotal Undistributed Costs Period 2		3,024	15,596	2,237	568	6,568	30,078	9,422	67,494	65,773	1,722	12,134	4,125	-	-	32,770
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	28,658	4,299	32,957	32,957	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	103,830	15,574	119,404	119,404	-	-	-	-	-	-
TOTAL PERIOD 2		8,835	51,491	9,808	3,233	53,461	242,555	73,004	442,386	437,645	4,740	95,156	7,599	574	-	953,833

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 3																
Demolition of Remaining Site Buildings																
50.1	Reactor	-	6,871	-	-	-	-	1,031	7,902	1,185	6,717	-	-	-	-	102,078
50.2	Capital Additions 85-2002	-	105	-	-	-	-	16	121	-	121	-	-	-	-	1,766
50.3	Containment Penetration Area	-	421	-	-	-	-	63	485	48	436	-	-	-	-	6,074
50.4	Fuel Handling	-	1,313	-	-	-	-	197	1,510	151	1,359	-	-	-	-	17,063
50.5	Miscellaneous	-	20	-	-	-	-	3	23	-	23	-	-	-	-	249
50.6	Turbine	-	2,510	-	-	-	-	377	2,887	-	2,887	-	-	-	-	42,836
50.7	Turbine Pedestal	-	935	-	-	-	-	140	1,075	-	1,075	-	-	-	-	11,300
50	Totals	-	12,176	-	-	-	-	1,826	14,002	1,385	12,617	-	-	-	-	181,367
Site Closeout Activities																
51	Grade & landscape site	-	1,386	-	-	-	-	208	1,594	-	1,594	-	-	-	-	4,587
52	Final report to NRC	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-
Period 3 Additional Cost																
53	Vessel & Internals GTCC Disposal	-	-	-	-	13,213	-	1,982	15,195	15,195	-	-	-	-	604	-
54	Spent Fuel Ops & Maintenance	-	-	-	-	-	296	44	341	341	-	-	-	-	-	-
55	Spent Fuel Fixed Costs	-	-	-	-	-	593	89	681	681	-	-	-	-	-	-
56	Spent Fuel Security	-	-	-	-	-	593	89	681	681	-	-	-	-	-	-
57	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	512	77	588	588	-	-	-	-	-	-
Subtotal Period 3 Activity Costs		-	13,562	-	-	13,213	2,118	4,334	33,227	19,015	14,212	-	-	-	604	185,953
1	Insurance	-	-	-	-	-	172	17	189	189	-	-	-	-	-	-
2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	3,779	-	-	-	-	567	4,346	-	4,346	-	-	-	-	-
4	Small tool allowance	-	154	-	-	-	-	23	177	-	177	-	-	-	-	-
5	Plant energy budget	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-
6	NRC ISFSI Fees	-	-	-	-	-	310	31	341	341	-	-	-	-	-	-
7	Site Security Cost	-	-	-	-	-	622	93	716	-	716	-	-	-	-	-
Subtotal Undistributed Costs Period 3		-	3,933	-	-	-	1,207	747	5,887	530	5,357	-	-	-	-	-
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	4,682	702	5,384	-	5,384	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	2,200	330	2,530	2,277	253	-	-	-	-	-
TOTAL PERIOD 3		-	17,495	-	-	13,213	10,207	6,113	47,028	21,822	25,206	-	-	-	604	185,953
TOTAL COST TO DECOMMISSION		11,279	70,868	11,140	4,108	71,583	315,599	91,266	575,844	544,907	30,937	98,652	16,255	574	604	1,163,017

Total cost to decommission with	18.83%	contingency	$575,843,588
Total NRC license termination cost is	94.63%	or	$544,906,510
Non-nuclear demolition cost is	5.37%	or	$30,937,078
Total burial site radwaste volume buried			115,481 cubic feet
Total 10CFR61 greater than class C waste buried			604 cubic feet
Total scrap metal released from site			12,215 tons
Total craft labor requirements			1,163,017 person hours

NOTES:

"0" indicates costs less than $500

1) This activity is performed by the decommissioning staff followng plant shutdown, the costs for this are included in this period's staff cost.
2) This activity, while performed after final plant shutdown, is considered part of operations and therefore no decommissioning costs are included for this activity

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 1																
1	Prepare preliminary decommissioning cost	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
2	Notification of Cessation of Operations	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
3	Remove fuel & source material	-	-	-	-	-	-	-	Note 2	-	-	-	-	-	-	-
4	Notification of Permanent Defueling	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
6	Prepare and submit PSDAR	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
7	Review plant dwgs & specs.	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
8	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
9	Estimate by-product inventory	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
10	End product description	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
11	Detailed by-product inventory	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
12	Define major work sequence	-	-	-	-	-	600	90	690	690	-	-	-	-	-	-
13	Perform SER and EA	-	-	-	-	-	248	37	285	285	-	-	-	-	-	-
14	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-
15	Prepare/submit License Termination Plan	-	-	-	-	-	328	49	377	377	-	-	-	-	-	-
16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
Activity Specifications																
17.1	Plant & temporary facilities	-	-	-	-	-	394	59	453	407	45	-	-	-	-	-
17.2	Plant systems	-	-	-	-	-	333	50	383	345	38	-	-	-	-	-
17.3	NSSS Decontamination Flush	-	-	-	-	-	40	6	46	46	-	-	-	-	-	-
17.4	Reactor Internals	-	-	-	-	-	568	85	653	653	-	-	-	-	-	-
17.5	Reactor vessel	-	-	-	-	-	520	78	598	598	-	-	-	-	-	-
17.6	Biological shield	-	-	-	-	-	40	6	46	46	-	-	-	-	-	-
17.7	Steam generators	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-
17.8	Reinforced concrete	-	-	-	-	-	128	19	147	74	74	-	-	-	-	-
17.9	Turbine & condenser	-	-	-	-	-	64	10	74	-	74	-	-	-	-	-
17.10	Plant structures & buildings	-	-	-	-	-	250	37	287	143	143	-	-	-	-	-
17.11	Waste management	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
17.12	Facility & site closeout	-	-	-	-	-	72	11	83	41	41	-	-	-	-	-
17	Total	-	-	-	-	-	3,025	454	3,479	3,064	416	-	-	-	-	-
Planning & Site Preparations																
18	Prepare dismantling sequence	-	-	-	-	-	192	29	221	221	-	-	-	-	-	-
19	Plant prep. & temp. svces	-	-	-	-	-	2,304	346	2,650	2,650	-	-	-	-	-	-
20	Design water clean-up system	-	-	-	-	-	112	17	129	129	-	-	-	-	-	-
21	Rigging/CCEs/tooling/etc.	-	-	-	-	-	1,950	293	2,243	2,243	-	-	-	-	-	-
22	Procure casks/liners & containers	-	-	-	-	-	98	15	113	113	-	-	-	-	-	-
Detailed Work Procedures																
23.1	Plant systems	-	-	-	-	-	379	57	435	392	44	-	-	-	-	-
23.2	NSSS Decontamination Flush	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.3	Vessel head	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
23.4	Reactor internals	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
23.5	Remaining buildings	-	-	-	-	-	108	16	124	31	93	-	-	-	-	-
23.6	CRD cooling assembly	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.7	CRD housings & ICI tubes	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.8	Incore instrumentation	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
23.9	Reactor vessel	-	-	-	-	-	290	44	334	334	-	-	-	-	-	-
23.10	Facility closeout	-	-	-	-	-	96	14	110	55	55	-	-	-	-	-
23.11	Missile shields	-	-	-	-	-	36	5	41	41	-	-	-	-	-	-
23.12	Biological shield	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-
23.13	Steam generators	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
23.14	Reinforced concrete	-	-	-	-	-	80	12	92	46	46	-	-	-	-	-
23.15	Turbine & condensers	-	-	-	-	-	250	37	287	-	287	-	-	-	-	-

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Detailed Work Procedures (cont.)																
23.16	Auxiliary building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
23.17	Reactor building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
23	Total	-	-	-	-	-	2,859	429	3,288	2,713	575	-	-	-	-	-
24	Decon primary loop	1,492	-	-	-	-	-	746	2,238	2,238	-	-	-	-	-	800
Period 1 Additional Costs																
25	Hazardous Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
26	Mixed Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
27	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	700	105	805	805	-	-	-	-	-	-
28	Spent Fuel Loading Campaigns	-	-	-	-	-	130	20	150	150	-	-	-	-	-	-
29	Spent Fuel Ops & Maintenance	-	-	-	-	-	415	62	478	478	-	-	-	-	-	-
30	Spent Fuel Fixed Costs	-	-	-	-	-	831	125	956	956	-	-	-	-	-	-
31	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	196	29	225	225	-	-	-	-	-	-
32	Spent Fuel Pool Isolation	-	-	-	-	-	5,051	758	5,809	5,809	-	-	-	-	-	-
33	Site Characterization	-	-	-	-	-	1,011	303	1,314	1,314	-	-	-	-	-	12,588
Subtotal Period 1 Activity Costs		1,492	-	-	-	-	22,461	4,267	28,219	27,229	991	-	-	-	-	13,388
Period 1 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	41	-	-	-	-	-	10	52	52	-	-	-	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
4	Process liquid waste	103	-	688	800	3,225	-	1,046	5,861	5,861	-	-	7,982	-	-	314
5	Insurance	-	-	-	-	-	3,564	356	3,920	3,920	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	302	-	-	-	-	76	378	378	-	-	-	-	-	-
8	Heavy equipment rental	-	261	-	-	-	-	39	300	300	-	-	-	-	-	-
9	Small tool allowance	-	12	-	-	-	-	2	14	14	-	-	-	-	-	-
10	Disposal of DAW generated	-	-	606	14	1,441	-	423	2,484	2,484	-	3,567	-	-	-	9,702
11	Plant energy budget	-	-	-	-	-	876	131	1,008	1,008	-	-	-	-	-	-
12	NRC ISFSI Fees	-	-	-	-	-	434	43	478	478	-	-	-	-	-	-
13	NRC Fees	-	-	-	-	-	245	25	270	270	-	-	-	-	-	-
14	Emergency Planning Fees	-	-	-	-	-	76	8	83	83	-	-	-	-	-	-
15	Site Security Cost	-	-	-	-	-	1,578	237	1,815	1,815	-	-	-	-	-	-
Subtotal Undistributed Costs Period 1		831	1,882	1,294	814	4,666	6,774	2,695	18,956	18,956	-	3,567	7,982	-	-	10,016
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	4,077	611	4,688	4,688	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	26,173	3,926	30,099	30,099	-	-	-	-	-	-
TOTAL PERIOD 1 COST		2,323	1,882	1,294	814	4,666	59,484	11,499	81,962	80,971	991	3,567	7,982	-	-	23,404
PERIOD 2																
Nuclear Steam Supply System Removal																
34.1	Reactor Coolant Piping	100	198	8	8	193	-	150	657	657	-	477	-	-	-	6,817
34.2	Pressurizer Relief Tank	25	22	9	8	251	-	83	399	399	-	621	-	-	-	1,080
34.3	Reactor Coolant Pumps & Motors	94	78	39	13	1,836	114	548	2,722	2,722	-	4,546	-	-	-	3,853
34.4	Pressurizer	38	48	362	313	905	-	340	2,006	2,006	-	2,318	-	-	-	1,867
34.5	Steam Generators	326	2,839	1,895	793	11,894	2,485	4,527	24,760	24,760	-	22,200	-	-	-	24,566
34.6	CRDMs/ICIs/Service Structure Removal	71	56	91	22	1,061	-	327	1,629	1,629	-	2,627	-	-	-	2,832
34.7	Reactor Vessel Internals	106	1,123	3,867	644	5,487	-	4,766	15,992	15,992	-	1,502	845	574	-	12,286
34.8	Reactor Vessel	79	3,118	674	553	8,069	-	6,720	19,213	19,213	-	6,416	2,379	-	-	33,020
34	Totals	839	7,482	6,946	2,354	29,696	2,599	17,462	67,378	67,378	-	40,707	3,224	574	-	86,320
35	Remove spent fuel racks	357	36	18	2	1,034	337	498	2,282	2,282	-	2,558	-	-	-	9,333

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Removal of Major Equipment																
36	Main Turbine/Generator	-	410	-	-	-	723	211	1,344	1,344	-	-	-	-	-	9,347
37	Main Condensers	-	1,191	-	-	-	827	422	2,440	2,440	-	-	-	-	-	27,026
Disposal of Plant Systems																
38.1	Auxiliary Steam	-	122	-	-	-	198	60	380	380	-	-	-	-	-	2,751
38.2	Auxiliary Steam (RCA)	-	117	-	-	-	93	43	253	253	-	-	-	-	-	2,707
38.3	Building Services (Non-Power Block)	-	5	-	-	-	-	1	5	-	5	-	-	-	-	106
38.4	Capital Additions 85-2002 (Clean)	-	638	-	-	-	-	96	733	-	733	-	-	-	-	14,662
38.5	Capital Additions 85-2002 (contaminated)	-	448	3	1	85	226	168	931	931	-	210	-	-	-	10,337
38.6	Chemical & Volume Control	877	777	26	12	712	317	863	3,584	3,584	-	1,763	-	-	-	37,131
38.7	Chemical & Volume Control (Insulated)	427	354	7	3	207	30	360	1,388	1,388	-	512	-	-	-	18,505
38.8	Component Cooling Water	-	124	-	-	-	-	19	143	-	143	-	-	-	-	2,984
38.9	Component Cooling Water (RCA)	-	528	-	-	-	691	236	1,455	1,455	-	-	-	-	-	12,322
38.10	Compressed Air	-	77	-	-	-	-	11	88	-	88	-	-	-	-	1,881
38.11	Compressed Air (Insulated)	-	4	-	-	-	-	1	5	-	5	-	-	-	-	99
38.12	Compressed Air (RCA Insulated)	-	22	-	-	-	9	7	37	37	-	-	-	-	-	513
38.13	Compressed Air (RCA)	-	387	-	-	-	167	122	676	676	-	-	-	-	-	9,116
38.14	Condensate System	-	1,011	-	-	-	3,525	781	5,317	5,317	-	-	-	-	-	22,930
38.15	Condensate System (Insulated)	-	345	-	-	-	1,166	261	1,772	1,772	-	-	-	-	-	7,832
38.16	Containment Spray	-	187	-	-	-	541	128	856	856	-	-	-	-	-	4,348
38.17	Diesel Engine-Generator	-	74	-	-	-	-	11	85	-	85	-	-	-	-	1,719
38.18	Diesel Engine-Generator (Insulated)	-	2	-	-	-	-	0	2	-	2	-	-	-	-	48
38.19	Electrical (Clean)	-	2,058	-	-	-	-	309	2,366	-	2,366	-	-	-	-	47,918
38.20	Electrical (Contaminated)	-	371	1	1	45	191	133	741	741	-	111	-	-	-	8,626
38.21	Electrical (Contaminated) - FHB	-	115	0	0	5	36	35	192	192	-	13	-	-	-	2,741
38.22	Electrical (RCA)	-	2,222	-	-	-	1,656	804	4,682	4,682	-	-	-	-	-	52,102
38.23	Electrical (RCA)-FHB	-	691	-	-	-	342	224	1,257	1,257	-	-	-	-	-	16,220
38.24	Extraction Steam & Heater Drip	-	402	-	-	-	887	234	1,522	1,522	-	-	-	-	-	9,195
38.25	Feedwater System	-	75	-	-	-	723	127	925	925	-	-	-	-	-	1,711
38.26	Feedwater System (Insulated)	-	108	-	-	-	-	16	122	-	122	-	-	-	-	2,547
38.27	Feedwater System (RCA Insulated)	-	107	-	-	-	155	50	311	311	-	-	-	-	-	2,521
38.28	Feedwater System (RCA)	-	5	-	-	-	8	2	16	16	-	-	-	-	-	118
38.29	Fire Protection	-	245	-	-	-	590	150	986	986	-	-	-	-	-	5,590
38.30	Fire Protection (RCA)	-	203	-	-	-	175	77	454	454	-	-	-	-	-	4,666
38.31	Gaseous Radwaste	-	108	2	1	49	48	46	252	252	-	121	-	-	-	2,505
38.32	HVAC (Clean Insulated)	-	26	-	-	-	-	4	30	-	30	-	-	-	-	662
38.33	HVAC (Clean)	-	274	-	-	-	-	41	315	-	315	-	-	-	-	6,878
38.34	HVAC (Contaminated Insulated)	-	220	1	0	25	155	84	485	485	-	61	-	-	-	4,609
38.35	HVAC (Contaminated)	-	942	7	3	181	763	396	2,292	2,292	-	448	-	-	-	19,921
38.36	HVAC (Contaminated) - FHB	-	213	1	0	25	167	85	491	491	-	62	-	-	-	4,495
38.37	Liquid Radwaste	355	317	15	6	392	112	374	1,570	1,570	-	970	-	-	-	15,541
38.38	Liquid Radwaste (Insulated)	40	35	1	0	25	2	35	138	138	-	61	-	-	-	1,771
38.39	Lube Oil Distribution & Purification	-	188	-	-	-	269	87	545	545	-	-	-	-	-	4,239
38.40	Make-up Water	-	161	-	-	-	-	24	185	-	185	-	-	-	-	3,794
38.41	Make-up Water (Insulated)	-	15	-	-	-	-	2	18	-	18	-	-	-	-	376
38.42	Make-up Water (RCA Insulated)	-	25	-	-	-	19	9	54	54	-	-	-	-	-	586
38.43	Make-up Water (RCA)	-	125	-	-	-	109	48	282	282	-	-	-	-	-	2,884
38.44	Mechanical Department Equipment	-	1	-	-	-	-	0	1	-	1	-	-	-	-	19
38.45	Miscellaneous Reactor Coolant	13	76	1	1	43	23	40	197	197	-	106	-	-	-	1,978
38.46	NSSS Sampling	-	95	2	1	62	7	41	208	208	-	154	-	-	-	2,395
38.47	NSSS Sampling (Insulated)	-	27	0	0	8	-	9	44	44	-	19	-	-	-	711
38.48	Nitrogen & Hydrogen	-	13	-	-	-	-	2	14	-	14	-	-	-	-	309
38.49	Nitrogen & Hydrogen (Insulated)	-	1	-	-	-	-	0	1	-	1	-	-	-	-	16
38.50	Nitrogen & Hydrogen (RCA Insulated)	-	4	-	-	-	1	1	7	7	-	-	-	-	-	98

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Disposal of Plant Systems (cont.)																
38.51	Nitrogen & Hydrogen (RCA)	-	79	-	-	-	27	24	129	129	-	-	-	-	-	1,853
38.52	Nuclear Steam Supply Sampling	-	19	0	0	10	2	7	38	38	-	24	-	-	-	441
38.53	Nuclear Steam Supply Sampling (Insulated	-	8	0	0	4	1	3	16	16	-	10	-	-	-	189
38.54	Oily Water Separator & TB Sump	-	20	-	-	-	33	10	62	62	-	-	-	-	-	441
38.55	Residual Heat Removal	248	256	30	14	841	240	439	2,067	2,067	-	2,081	-	-	-	8,554
38.56	Safety Injection	-	92	2	1	44	60	43	241	241	-	109	-	-	-	2,157
38.57	Safety Injection (Insulated)	-	5	0	0	3	2	2	12	12	-	7	-	-	-	116
38.58	Safety Injection (RCA Insulated)	-	36	1	0	24	16	16	97	97	-	60	-	-	-	833
38.59	Safety Injection (RCA)	-	294	8	4	217	160	153	835	835	-	537	-	-	-	6,789
38.60	Saltwater System	-	120	-	-	-	-	18	138	-	138	-	-	-	-	2,779
38.61	Service Cooling Water	-	90	-	-	-	-	14	104	-	104	-	-	-	-	2,186
38.62	Service Cooling Water (RCA)	-	30	-	-	-	28	12	70	70	-	-	-	-	-	698
38.63	Sewer System Expansion	-	31	-	-	-	-	5	36	-	36	-	-	-	-	748
38.64	Spent Fuel Pit Cooling	-	65	11	5	319	94	112	606	606	-	790	-	-	-	1,555
38.65	Spent Fuel Pit Cooling - FHB	-	90	12	6	342	101	125	677	677	-	848	-	-	-	2,157
38.66	Turbine Steam Supply	-	1,157	-	-	-	4,610	981	6,748	6,748	-	-	-	-	-	26,620
38.67	Turbine Steam Supply (RCA)	-	803	-	-	-	1,234	386	2,422	2,422	-	-	-	-	-	18,952
38.68	Turbine and Generator	-	102	-	-	-	250	63	416	416	-	-	-	-	-	2,299
38.69	Turbine and Generator (Insulated)	-	48	-	-	-	46	18	111	111	-	-	-	-	-	1,037
38	Totals	1,960	18,026	130	59	3,666	20,308	9,089	53,239	48,847	4,391	9,074	-	-	-	458,334
39	Erect scaffolding for systems removal	-	7,950	4	1	111	292	2,060	10,419	10,419	-	276	-	-	-	79,553
Decontamination of Site Buildings																
40.1	Reactor	1,253	1,116	375	180	10,197	427	3,583	17,131	17,131	-	25,241	-	-	-	51,630
40.2	Auxiliary	1,111	103	96	46	2,630	183	1,283	5,451	5,451	-	6,510	-	-	-	26,226
40.3	Capital Additions 85-2002	326	14	24	11	672	-	339	1,385	1,385	-	1,662	-	-	-	7,457
40.4	Containment Penetration Area	273	41	24	11	651	95	328	1,422	1,422	-	1,811	-	-	-	6,852
40.5	Fuel Handling	613	383	31	15	841	260	657	2,800	2,800	-	2,081	-	-	-	22,200
40.6	Radwaste Storage	38	6	10	5	286	6	94	445	445	-	707	-	-	-	766
40	Totals	3,614	1,663	561	268	15,276	970	6,283	28,635	28,635	-	37,812	-	-	-	115,131
41	License Termination Survey	-	-	-	-	-	9,074	2,722	11,796	11,796	-	-	-	-	-	217,991
42	ORISE confirmatory survey	-	-	-	-	-	105	32	137	137	-	-	-	-	-	-
43	Terminate license	-	-	-	-	-	-	-	note 2	-	-	-	-	-	-	-
Period 2 Additional Costs																
44	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	33,696	5,054	38,750	38,750	-	-	-	-	-	-
45	Spent Fuel Loading Campaigns	-	-	-	-	-	3,826	574	4,400	4,400	-	-	-	-	-	-
46	Spent Fuel Ops & Maintenance	-	-	-	-	-	1,333	200	1,533	1,533	-	-	-	-	-	-
47	Spent Fuel Fixed Costs	-	-	-	-	-	2,666	400	3,066	3,066	-	-	-	-	-	-
48	Spent Fuel Security	-	-	-	-	-	454	68	522	522	-	-	-	-	-	-
49	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	1,582	237	1,819	1,819	-	-	-	-	-	-
Subtotal Period 2 Activity Costs		6,770	36,757	7,659	2,684	49,783	78,793	45,313	227,759	223,367	4,391	90,427	3,224	574	-	1,003,038
Period 2 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	1,247	-	-	-	-	-	312	1,559	1,559	-	-	-	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
4	Process liquid waste	399	-	269	522	1,643	-	715	3,548	3,548	-	-	4,067	-	-	566
5	Insurance	-	-	-	-	-	2,084	208	2,293	2,293	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	4,092	-	-	-	-	1,023	5,114	5,114	-	-	-	-	-	-
8	Heavy equipment rental	-	8,027	-	-	-	-	1,204	9,231	8,308	923	-	-	-	-	-
9	Small tool allowance	-	594	-	-	-	-	89	683	615	68	-	-	-	-	-
10	Pipe cutting equipment	-	911	-	-	-	-	137	1,048	1,048	-	-	-	-	-	-

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Period 2 Undistributed Costs (cont.)																
11	Decon rig	1,184	-	-	-	-	-	178	1,362	1,362	-	-	-	-	-	-
12	Disposal of DAW generated	-	-	1,814	42	4,311	-	1,265	7,432	7,432	-	10,671	-	-	-	29,025
13	Decommissioning Equipment Disposition	-	-	8	4	231	460	131	855	855	-	572	-	-	-	778
14	Plant energy budget	-	-	-	-	-	4,969	745	5,714	5,143	571	-	-	-	-	-
15	NRC ISFSI Fees	-	-	-	-	-	1,394	139	1,533	1,533	-	-	-	-	-	-
16	NRC Fees	-	-	-	-	-	2,672	267	2,939	2,939	-	-	-	-	-	-
17	Emergency Planning Fees	-	-	-	-	-	610	61	671	671	-	-	-	-	-	-
18	Site Security Cost	-	-	-	-	-	19,050	2,858	21,908	21,908	-	-	-	-	-	-
19	LLRW Processing Equipment	-	-	-	-	-	1,346	202	1,547	1,547	-	-	-	-	-	-
Subtotal Undistributed Costs Period 2		3,517	14,929	2,092	568	6,185	32,604	9,833	69,728	68,165	1,563	11,243	4,067	-	-	30,368
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	29,060	4,362	33,442	33,442	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	108,415	16,262	124,677	124,677	-	-	-	-	-	-
TOTAL PERIOD 2		10,287	51,686	9,790	3,252	55,968	248,892	75,771	455,606	449,652	5,954	101,669	7,291	574	-	1,033,407
PERIOD 3																
Demolition of Remaining Site Buildings																
50.1	Reactor	-	6,887	-	-	-	-	1,033	7,921	1,188	6,732	-	-	-	-	102,078
50.2	Administration	-	793	-	-	-	-	119	912	-	912	-	-	-	-	10,358
50.3	Auxiliary	-	5,449	-	-	-	-	817	6,266	627	5,639	-	-	-	-	82,811
50.4	Breakwater	-	35,437	-	-	-	-	5,316	40,752	-	40,752	-	-	-	-	118,381
50.5	Capital Additions 85-2002	-	3,410	-	-	-	-	512	3,922	-	3,922	-	-	-	-	51,043
50.6	Chemical Storage	-	3	-	-	-	-	1	4	-	4	-	-	-	-	46
50.7	Chlorination	-	7	-	-	-	-	1	8	-	8	-	-	-	-	97
50.8	Circulating Water Tunnels	-	1,035	-	-	-	-	155	1,190	-	1,190	-	-	-	-	20,361
50.9	Cold Machine Shop	-	290	-	-	-	-	43	333	-	333	-	-	-	-	3,779
50.10	Communication	-	3	-	-	-	-	0	4	-	4	-	-	-	-	44
50.11	Condensate Polishing/Technical Support	-	386	-	-	-	-	58	444	-	444	-	-	-	-	6,959
50.12	Containment Penetration Area	-	423	-	-	-	-	63	486	49	438	-	-	-	-	6,077
50.13	Discharge Structure	-	756	-	-	-	-	113	869	-	869	-	-	-	-	8,052
50.14	Fabrication Shop	-	92	-	-	-	-	14	106	-	106	-	-	-	-	1,223
50.15	Fire Pump House	-	4	-	-	-	-	1	5	-	5	-	-	-	-	55
50.16	Fuel Handling	-	1,276	-	-	-	-	191	1,468	147	1,321	-	-	-	-	18,457
50.17	Hazardous Waste Storage Facility	-	1,360	-	-	-	-	204	1,564	-	1,564	-	-	-	-	417
50.18	Intake Structure	-	4,296	-	-	-	-	644	4,940	-	4,940	-	-	-	-	46,342
50.19	Maintenance Shop	-	266	-	-	-	-	40	306	-	306	-	-	-	-	3,444
50.20	Miscellaneous Structures	-	51	-	-	-	-	8	58	-	58	-	-	-	-	703
50.21	NPO Permanent Warehouse	-	1,057	-	-	-	-	159	1,216	-	1,216	-	-	-	-	14,092
50.22	Ponds	-	1	-	-	-	-	0	1	-	1	-	-	-	-	18
50.23	Portable Fire Pump & Fuel Cart	-	1	-	-	-	-	0	1	-	1	-	-	-	-	14
50.24	Pretreatment	-	8	-	-	-	-	1	9	-	9	-	-	-	-	108
50.25	Radwaste Storage	-	1,403	-	-	-	-	210	1,613	81	1,533	-	-	-	-	18,420
50.26	Rotor Warhouse	-	717	-	-	-	-	107	824	-	824	-	-	-	-	9,038
50.27	Security	-	286	-	-	-	-	43	329	-	329	-	-	-	-	3,942
50.28	Simulator	-	316	-	-	-	-	47	364	-	364	-	-	-	-	4,191
50.29	Telephone Terminal	-	2	-	-	-	-	0	2	-	2	-	-	-	-	28
50.30	Turbine	-	3,466	-	-	-	-	520	3,986	-	3,986	-	-	-	-	58,341
50.31	Turbine Pedestal	-	938	-	-	-	-	141	1,079	-	1,079	-	-	-	-	11,300
50.32	Vehicle Maintenance	-	27	-	-	-	-	4	31	-	31	-	-	-	-	366
50.33	Waste Water Holding & Treatment Facility	-	18	-	-	-	-	3	20	-	20	-	-	-	-	238
50	Totals	-	70,464	-	-	-	-	10,570	81,034	2,091	78,943	-	-	-	-	601,721

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Site Closeout Activities																
51	Remove Rubble	-	108,505	-	-	-	-	16,276	124,781	-	124,781	-	-	-	-	184,226
52	Grade & landscape site	-	1,395	-	-	-	-	209	1,605	-	1,605	-	-	-	-	4,587
53	Final report to NRC	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-
Period 3 Additional Cost																
54	Vessel & Internals GTCC Disposal	-	-	-	-	13,213	-	1,982	15,195	15,195	-	-	-	-	604	-
55	ISFSI License Termination	26	2,179	54	17	1,063	1,152	1,004	5,496	5,496	-	2,632	-	-	-	40,148
56	ISFSI Demolition	-	1,557	-	-	-	34	239	1,830	-	1,830	-	-	-	-	15,396
57	Spent Fuel Ops & Maintenance	-	-	-	-	-	208	31	239	239	-	-	-	-	-	-
58	Spent Fuel Fixed Cost	-	-	-	-	-	416	62	478	478	-	-	-	-	-	-
59	Spent Fuel Security	-	-	-	-	-	416	62	478	478	-	-	-	-	-	-
60	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	353	53	406	406	-	-	-	-	-	-
Subtotal Period 3 Activity Costs		26	184,100	54	17	14,276	2,703	30,507	231,684	24,526	207,158	2,632	-	-	604	846,078
Period 3 Undistributed Costs																
1	Insurance	-	-	-	-	-	218	22	240	240	-	-	-	-	-	-
2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	3,779	-	-	-	-	567	4,346	-	4,346	-	-	-	-	-
4	Small tool allowance	-	691	-	-	-	-	104	795	-	795	-	-	-	-	-
5	Plant energy budget	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-
6	NRC ISFSI Fees	-	-	-	-	-	217	22	239	239	-	-	-	-	-	-
7	Emergency Planning Fees	-	-	-	-	-	212	21	234	234	-	-	-	-	-	-
8	Site Security Cost	-	-	-	-	-	2,572	386	2,958	-	2,958	-	-	-	-	-
Subtotal Undistributed Costs Period 3		-	4,471	-	-	-	3,323	1,137	8,930	712	8,218	-	-	-	-	-
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	9,994	1,499	11,493	-	11,493	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	10,128	1,519	11,647	10,483	1,165	-	-	-	-	-
TOTAL PERIOD 3		26	188,571	54	17	14,276	26,148	34,662	263,754	35,721	228,033	2,632	-	-	604	846,078
TOTAL COST TO DECOMMISSION		12,637	242,138	11,099	4,082	74,910	334,524	121,932	801,322	566,343	234,978	107,868	15,272	574	604	1,902,888

Total cost to decommission with	17.95%	contingency	$801,321,541	
Total NRC license termination cost is	70.68%	or	$566,343,446	
Non-nuclear demolition cost is	29.32%	or	$234,978,098	
Total burial site radwaste volume buried			123,715	cubic feet
Total 10CFR61 greater than class C waste buried			604	cubic feet
Total scrap metal released from site			22,080	tons
Total craft labor requirements			1,902,888	person hours

NOTES:

"0" indicates costs less than $500

1) This activity is performed by the decommissioning staff following plant shutdown; the costs for this are included in this period's staff cost.
2) This activity, while performed after final plant shutdown, is considered part of operations and therefore no decommissioning costs are included for this activity.

APPENDIX D

DETAILED COST ANALYSES - SAFSTOR

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 1																
1	SAFSTOR site characterization survey	-	-	-	-	-	279	84	362	362	-	-	-	-	-	-
2	Prepare preliminary decommissioning cost	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
3	Notification of Cessation of Operations	-	-	-	-	-	-	-	Note 2	-	-	-	-	-	-	-
4	Remove fuel & source materials	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
5	Notification of Permanent Defueling	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
7	Prepare and submit PSDAR	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
8	Review plant dwgs & specs.	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
9	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
10	Estimate by-product inventory	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
11	End product description	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
12	Detailed by-product inventory	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-
13	Define major work sequence	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
14	Perform SER and EA	-	-	-	-	-	248	37	285	285	-	-	-	-	-	-
15	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-
Activity Specifications																
16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	394	59	453	453	-	-	-	-	-	-
16.2	Plant systems	-	-	-	-	-	333	50	383	383	-	-	-	-	-	-
16.3	Plant structures and buildings	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-
16.4	Waste management	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
16.5	Facility and site dormancy	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
16	Total	-	-	-	-	-	1,296	194	1,491	1,491	-	-	-	-	-	-
Detailed Work Procedures																
17.1	Plant systems	-	-	-	-	-	379	57	435	435	-	-	-	-	-	-
17.2	Facility closeout & dormancy	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-
17	Total	-	-	-	-	-	475	71	546	546	-	-	-	-	-	-
18	Procure vacuum drying system	-	-	-	-	-	8	1	9	9	-	-	-	-	-	-
19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
20	Drain & dry NSSS	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
22	Decon/secure contaminated systems	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
Decontamination of Site Buildings																
23.1	Reactor	1,136	-	-	-	-	-	568	1,704	1,704	-	-	-	-	-	26,109
23.2	Containment Penetration Area	187	-	-	-	-	-	93	280	280	-	-	-	-	-	4,381
23.3	Fuel Handling	492	-	-	-	-	-	246	737	737	-	-	-	-	-	10,962
23	Totals	1,814	-	-	-	-	-	907	2,721	2,721	-	-	-	-	-	41,452
24	Prepare support equipment for storage	-	385	-	-	-	-	58	442	442	-	-	-	-	-	3,000
25	Install containment pressure equal. lines	-	34	-	-	-	-	5	39	39	-	-	-	-	-	700
26	Interim survey prior to dormancy	-	-	-	-	-	320	48	367	367	-	-	-	-	-	-
27	Secure building accesses	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
28	Prepare & submit interim report	-	-	-	-	-	47	7	54	54	-	-	-	-	-	-
Period 1 Additional Costs																
29	Hazardous Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
30	Mixed Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
31	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-
32	Spent Fuel Loading Campaigns	-	-	-	-	-	29	4	34	34	-	-	-	-	-	-
33	Spent Fuel Ops & Maintenance	-	-	-	-	-	25	4	28	28	-	-	-	-	-	-
34	Spent Fuel Fixed Costs	-	-	-	-	-	49	7	56	56	-	-	-	-	-	-
35	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	196	29	225	225	-	-	-	-	-	-
36	Spent Fuel Pool Isolation	-	-	-	-	-	7,577	1,137	8,714	8,714	-	-	-	-	-	-
Subtotal Period 1 Activity Costs		[illegible]	419	-	-	-	12,948	2,954	18,134	[illegible]	-	-	-	-	-	[illegible]

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Period 1 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	655	-	-	-	-	-	164	818	818	-	-	-	-	-	-
3	Process liquid waste	248	-	92	244	681	-	340	1,605	1,605	-	-	1,686	-	-	331
4	Insurance	-	-	-	-	-	1,704	170	1,875	1,875	-	-	-	-	-	-
5	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Health physics supplies	-	408	-	-	-	-	102	509	509	-	-	-	-	-	-
7	Small tool allowance	-	36	-	-	-	-	5	42	42	-	-	-	-	-	-
8	Disposal of DAW generated	-	-	594	14	1,412	-	415	2,435	2,435	-	3,496	-	-	-	9,509
9	Plant energy budget	-	-	-	-	-	809	121	930	930	-	-	-	-	-	-
10	NRC ISFSI Fees	-	-	-	-	-	26	3	28	28	-	-	-	-	-	-
11	NRC Fees	-	-	-	-	-	404	40	445	445	-	-	-	-	-	-
12	Emergency Planning Fees	-	-	-	-	-	76	8	83	83	-	-	-	-	-	-
13	Site Security Cost	-	-	-	-	-	2,215	332	2,547	2,547	-	-	-	-	-	-
Subtotal Undistributed Costs Period 1		1,590	444	687	257	2,093	5,234	1,803	12,107	12,107	-	3,496	1,686	-	-	9,840
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	22,890	3,433	26,323	26,323	-	-	-	-	-	-
TOTAL COST TO SAFSTOR		3,404	862	687	257	2,093	41,071	6,190	56,565	56,565	-	3,496	1,686	-	-	54,992
PERIOD 2: Safstor Annual Maintenance Cost																
1	Quarterly inspection	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
2	Semi-annual environmental survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
3	Prepare reports	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
4	Health physics supplies	-	-	-	-	-	56	14	70	70	-	-	-	-	-	-
5	Insurance	-	-	-	-	-	111	11	122	122	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Disposal of contaminated solid waste	-	-	2	0	41	-	11	54	54	-	102	-	-	-	28
8	Bituminous roof replacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Maintenance supplies	-	-	-	-	-	120	30	150	150	-	-	-	-	-	-
10	Plant energy budget	-	-	-	-	-	84	13	96	96	-	-	-	-	-	-
11	NRC ISFSI Fees	-	-	-	-	-	64	6	70	70	-	-	-	-	-	-
12	NRC Fees	-	-	-	-	-	117	12	129	129	-	-	-	-	-	-
13	Emergency Planning Fees	-	-	-	-	-	28	3	31	31	-	-	-	-	-	-
14	Site Security Cost	-	-	-	-	-	210	32	242	242	-	-	-	-	-	-
15	Site maintenance staff	-	-	-	-	-	2,853	428	3,281	3,281	-	-	-	-	-	-
Period 2 Additional Costs																
16	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	1,083	162	1,245	1,245	-	-	-	-	-	-
17	Spent Fuel Loading Campaigns	-	-	-	-	-	124	19	143	143	-	-	-	-	-	-
18	Spent Fuel Ops & Maintenance	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-
19	Spent Fuel Fixed Costs	-	-	-	-	-	122	18	141	141	-	-	-	-	-	-
20	Spent Fuel Security	-	-	-	-	-	28	4	32	32	-	-	-	-	-	-
21	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-
PERIOD 2 ANNUAL MAINTENANCE TOTALS		-	-	2	0	41	5,123	780	5,946	5,946	-	102	-	-	-	28

MAINTENANCE COST FOR 31.62 YEARS DORMANCY: $188,024,032

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 3																
1	Review plant dwgs & specs.	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
2	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
3	End product description	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
4	Detailed by-product inventory	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
5	Define major work sequence	-	-	-	-	-	600	90	690	690	-	-	-	-	-	-
6	Perform SER and EA	-	-	-	-	-	248	37	285	285	-	-	-	-	-	-
7	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-
8	Prepare/submit License Termination Plan	-	-	-	-	-	328	49	377	377	-	-	-	-	-	-
9	Receive NRC approval of termination plan	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
Activity Specifications																
10.1	Re-activate plant & temporary facilities	-	-	-	-	-	589	88	678	610	68	-	-	-	-	-
10.2	Plant systems	-	-	-	-	-	333	50	383	345	38	-	-	-	-	-
10.3	Reactor internals	-	-	-	-	-	568	85	653	653	-	-	-	-	-	-
10.4	Reactor vessel	-	-	-	-	-	520	78	598	598	-	-	-	-	-	-
10.5	Biological shield	-	-	-	-	-	40	6	46	46	-	-	-	-	-	-
10.6	Steam generators	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-
10.7	Reinforced concrete	-	-	-	-	-	128	19	147	74	74	-	-	-	-	-
10.8	Turbine & condenser	-	-	-	-	-	64	10	74	-	74	-	-	-	-	-
10.9	Plant structures & buildings	-	-	-	-	-	250	37	287	143	143	-	-	-	-	-
10.10	Waste management	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
10.11	Facility & site closeout	-	-	-	-	-	72	11	83	41	41	-	-	-	-	-
10	Total	-	-	-	-	-	3,181	477	3,659	3,220	438	-	-	-	-	-
Planning & Site Preparations																
11	Prepare dismantling sequence	-	-	-	-	-	192	29	221	221	-	-	-	-	-	-
12	Plant prep. & temp. svces	-	-	-	-	-	2,304	346	2,650	2,650	-	-	-	-	-	-
13	Design water clean-up system	-	-	-	-	-	112	17	129	129	-	-	-	-	-	-
14	Rigging/CCEs/tooling/etc.	-	-	-	-	-	1,950	293	2,243	2,243	-	-	-	-	-	-
15	Procure casks/liners & containers	-	-	-	-	-	98	15	113	113	-	-	-	-	-	-
Detailed Work Procedures																
16.1	Plant systems	-	-	-	-	-	379	57	435	392	44	-	-	-	-	-
16.2	Vessel head	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
16.3	Reactor internals	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
16.4	Remaining buildings	-	-	-	-	-	108	16	124	31	93	-	-	-	-	-
16.5	CRD cooling assembly	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
16.6	CRD housings & ICI tubes	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
16.7	Incore instrumentation	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
16.8	Reactor vessel	-	-	-	-	-	290	44	334	334	-	-	-	-	-	-
16.9	Facility closeout	-	-	-	-	-	96	14	110	55	55	-	-	-	-	-
16.10	Missile shields	-	-	-	-	-	36	5	41	41	-	-	-	-	-	-
16.11	Biological shield	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-
16.12	Steam generators	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
16.13	Reinforced concrete	-	-	-	-	-	80	12	92	46	46	-	-	-	-	-
16.14	Turbine & condensers	-	-	-	-	-	250	37	287	-	287	-	-	-	-	-
16.15	Auxiliary building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
16.16	Reactor building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
16	Total	-	-	-	-	-	2,779	417	3,196	2,621	575	-	-	-	-	-
Period 3 Additional Costs																
17	Site Characterization	-	-	-	-	-	1,011	303	1,314	1,314	-	-	-	-	-	12,588
Subtotal Period 3 Activity Costs		-	-	-	-	-	13,754	2,215	15,969	14,956	1,013	-	-	-	-	[illegible]
Period 3 Undistributed Costs																
1	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
2	Insurance	-	-	-	-	-	146	15	161	161	-	-	-	-	-	

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Period 3 Undistributed Costs (cont)																
3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Health physics supplies	-	300	-	-	-	-	75	375	375	-	-	-	-	-	-
5	Heavy equipment rental	-	553	-	-	-	-	83	635	635	-	-	-	-	-	-
6	Disposal of DAW generated	-	-	594	14	1,412	-	415	2,435	2,435	-	3,496	-	-	-	9,509
7	Plant energy budget	-	-	-	-	-	836	125	961	961	-	-	-	-	-	-
8	NRC Fees	-	-	-	-	-	245	25	270	270	-	-	-	-	-	-
9	Site Security Cost	-	-	-	-	-	1,578	237	1,814	1,814	-	-	-	-	-	-
Subtotal Undistributed Costs Period 3		-	2,158	594	14	1,412	2,805	1,169	8,153	8,153	-	3,496	-	-	-	9,509
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	9,510	1,427	10,937	10,937	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	21,626	3,244	24,870	24,870	-	-	-	-	-	-
TOTAL PERIOD 3 COST		-	2,158	594	14	1,412	47,696	8,055	59,929	58,916	1,013	3,496	-	-	-	22,097
PERIOD 4																
Nuclear Steam Supply System Removal																
18.1	Reactor Coolant Piping	21	179	7	3	173	9	101	492	492	-	429	-	-	-	4,649
18.2	Pressurizer Relief Tank	5	20	8	3	226	7	68	336	336	-	559	-	-	-	602
18.3	Reactor Coolant Pumps & Motors	19	69	35	12	1,653	261	485	2,533	2,533	-	4,091	-	-	-	1,995
18.4	Pressurizer	38	34	362	313	905	-	337	1,988	1,988	-	2,318	-	-	-	1,867
18.5	Steam Generators	67	2,839	1,895	792	11,894	2,485	4,398	24,371	24,371	-	22,200	-	-	-	24,566
18.6	CRDMs/ICIs/Service Structure Removal	15	56	91	8	1,061	-	297	1,528	1,528	-	2,627	-	-	-	1,638
18.7	Reactor Vessel Internals	54	958	3,730	411	3,438	-	3,497	12,085	12,085	-	2,657	376	584	-	8,358
18.8	Reactor Vessel	71	2,820	430	294	4,999	-	4,831	13,444	13,444	-	6,481	3,145	-	-	22,215
18	Totals	290	6,973	6,559	1,835	24,347	2,762	14,011	56,777	56,777	-	41,363	3,521	584	-	65,888
19	Remove spent fuel racks	323	36	18	2	1,034	337	482	2,232	2,232	-	2,560	-	-	-	8,452
Removal of Major Equipment																
20	Main Turbine/Generator	-	356	-	-	-	712	196	1,264	1,264	-	-	-	-	-	8,119
21	Main Condensers	-	1,067	-	-	-	627	391	2,285	2,285	-	-	-	-	-	24,147
Disposal of Plant Systems																
22.1	Auxiliary Steam	-	240	-	-	-	361	114	716	716	-	-	-	-	-	5,424
22.2	Auxiliary Steam (RCA)	-	238	-	-	-	189	88	515	515	-	-	-	-	-	5,529
22.3	Capital Additions 85-2002 (clean)	-	120	-	-	-	-	18	138	-	138	-	-	-	-	2,830
22.4	Capital Additions 85-2002 (contaminated)	-	344	-	-	-	184	114	642	642	-	-	-	-	-	8,126
22.5	Chemical & Volume Control	-	804	18	8	504	509	406	2,249	2,249	-	1,247	-	-	-	18,747
22.6	Chemical & Volume Control (Insulated)	-	348	6	3	184	51	142	733	733	-	455	-	-	-	8,148
22.7	Component Cooling Water	-	128	-	-	-	-	19	147	-	147	-	-	-	-	3,078
22.8	Component Cooling Water (RCA)	-	539	-	-	-	690	238	1,467	1,467	-	-	-	-	-	12,581
22.9	Compressed Air	-	114	-	-	-	-	17	131	-	131	-	-	-	-	2,744
22.10	Compressed Air (Insulated)	-	4	-	-	-	-	1	5	-	5	-	-	-	-	98
22.11	Compressed Air (RCA Insulated)	-	22	-	-	-	8	7	37	37	-	-	-	-	-	517
22.12	Compressed Air (RCA)	-	397	-	-	-	157	123	677	677	-	-	-	-	-	9,314
22.13	Condensate System	-	1,107	-	-	-	3,824	850	5,781	5,781	-	-	-	-	-	25,117
22.14	Condensate System (Insulated)	-	358	-	-	-	1,179	266	1,803	1,803	-	-	-	-	-	8,131
22.15	Containment Spray	-	198	-	-	-	561	134	893	893	-	-	-	-	-	4,622
22.16	Diesel Engine-Generator	-	118	-	-	-	-	18	136	-	136	-	-	-	-	2,760
22.17	Diesel Engine-Generator (Insulated)	-	7	-	-	-	-	1	8	-	8	-	-	-	-	178
22.18	Electrical (Clean)	-	1,407	-	-	-	-	211	1,618	-	1,618	-	-	-	-	32,770
22.19	Electrical (Contaminated)	-	578	-	-	-	419	207	1,204	1,204	-	-	-	-	-	13,689
22.20	Electrical (Contaminated) - FHB	-	174	-	-	-	64	53	291	291	-	-	-	-	-	4,122
22.21	Electrical (Decontaminated)	-	3,895	-	-	-	3,955	1,567	9,417	9,417	-	-	-	-	-	91,243
22.22	Electrical (Decontaminated) - FHB	-	1,171	-	-	-	585	380	2,136	2,136	-	-	-	-	-	27,474
22.23	Extraction Steam & Heater Drip	-	475	-	-	-	926	258	1,658	1,658	-	-	-	-	-	10,874
22.24	Feedwater System	-	53	-	-	-	311	60	424	424	-	-	-	-	-	1,212
22.25	Feedwater System (Insulated)	-	284	-	-	-	649	168	1,102	1,102	-	-	-	-	-	6,532

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2003 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Disposal of Plant Systems (cont)																
22.26	Feedwater System (RCA Insulated)	-	111	-	-	-	156	51	319	319	-	-	-	-	-	2,624
22.27	Feedwater System (RCA)	-	5	-	-	-	8	3	16	16	-	-	-	-	-	123
22.28	Fire Protection	-	260	-	-	-	599	155	1,013	1,013	-	-	-	-	-	5,914
22.29	Fire Protection (RCA)	-	195	-	-	-	128	68	390	390	-	-	-	-	-	4,482
22.30	Gaseous Radwaste	-	70	-	-	-	27	22	119	119	-	-	-	-	-	1,629
22.31	HVAC (Clean Insulated)	-	19	-	-	-	-	3	21	-	21	-	-	-	-	475
22.32	HVAC (Clean)	-	235	-	-	-	-	35	270	-	270	-	-	-	-	5,804
22.33	HVAC (Contaminated Insulated)	-	263	-	-	-	240	102	604	604	-	-	-	-	-	5,362
22.34	HVAC (Contaminated)	-	1,124	-	-	-	1,198	461	2,783	2,783	-	-	-	-	-	23,174
22.35	HVAC (Contaminated) - FHB	-	270	-	-	-	274	109	652	652	-	-	-	-	-	5,548
22.36	Liquid Radwaste	-	528	16	7	448	211	278	1,489	1,489	-	1,110	-	-	-	12,332
22.37	Liquid Radwaste (Insulated)	-	65	1	1	44	6	28	146	146	-	108	-	-	-	1,523
22.38	Lube Oil Distribution & Purification	-	173	-	-	-	161	67	402	402	-	-	-	-	-	3,879
22.39	Make-up Water	-	236	-	-	-	-	35	271	-	271	-	-	-	-	5,614
22.40	Make-up Water (Insulated)	-	21	-	-	-	-	3	24	-	24	-	-	-	-	521
22.41	Make-up Water (RCA Insulated)	-	36	-	-	-	22	12	70	70	-	-	-	-	-	833
22.42	Make-up Water (RCA)	-	186	-	-	-	124	65	375	375	-	-	-	-	-	4,307
22.43	Miscellaneous Reactor Coolant	-	65	1	0	27	30	28	151	151	-	67	-	-	-	1,555
22.44	Nitrogen & Hydrogen	-	13	-	-	-	-	2	15	-	15	-	-	-	-	315
22.45	Nitrogen & Hydrogen (Insulated)	-	1	-	-	-	-	0	1	-	1	-	-	-	-	17
22.46	Nitrogen & Hydrogen (RCA Insulated)	-	5	-	-	-	2	1	7	7	-	-	-	-	-	106
22.47	Nitrogen & Hydrogen (RCA)	-	86	-	-	-	30	26	142	142	-	-	-	-	-	2,009
22.48	Nuclear Steam Supply Sampling	-	103	-	-	-	45	33	181	181	-	-	-	-	-	2,571
22.49	Nuclear Steam Supply Sampling (Insulated	-	32	-	-	-	6	9	46	46	-	-	-	-	-	806
22.50	Oily Water Separator & TB Sump	-	30	-	-	-	49	15	95	95	-	-	-	-	-	672
22.51	Residual Heat Removal	-	244	11	5	309	469	211	1,249	1,249	-	765	-	-	-	5,784
22.52	Safety Injection	-	84	-	-	-	78	33	195	195	-	-	-	-	-	1,961
22.53	Safety Injection (Insulated)	-	5	-	-	-	3	2	10	10	-	-	-	-	-	121
22.54	Safety Injection (RCA Insulated)	-	37	-	-	-	28	14	79	79	-	-	-	-	-	871
22.55	Safety Injection (RCA)	-	309	-	-	-	252	115	677	677	-	-	-	-	-	7,141
22.56	Saltwater System	-	127	-	-	-	-	19	146	-	146	-	-	-	-	2,926
22.57	Service Cooling Water	-	77	-	-	-	-	12	88	-	88	-	-	-	-	1,856
22.58	Service Cooling Water (RCA)	-	24	-	-	-	21	9	54	54	-	-	-	-	-	560
22.59	Spent Fuel Pit Cooling	-	57	3	1	88	188	65	402	402	-	218	-	-	-	1,347
22.60	Spent Fuel Pit Cooling - FHB	-	80	4	2	103	198	76	462	462	-	255	-	-	-	1,883
22.61	Turbine Steam Supply	-	1,128	-	-	-	4,522	960	6,609	6,609	-	-	-	-	-	25,947
22.62	Turbine Steam Supply (RCA)	-	778	-	-	-	1,178	371	2,328	2,328	-	-	-	-	-	18,372
22.63	Turbine and Generator	-	101	-	-	-	236	61	398	398	-	-	-	-	-	2,272
22.64	Turbine and Generator (Insulated)	-	51	-	-	-	49	20	121	121	-	-	-	-	-	1,150
22	Totals	-	20,356	60	28	1,707	25,158	9,037	56,346	53,327	3,019	4,226	-	-	-	470,247
23	Erect scaffolding for systems removal	-	4,138	2	1	50	132	1,067	5,390	5,390	-	124	-	-	-	36,623
Decontamination of Site Buildings																
24.1	Reactor	1,104	997	366	176	9,974	449	3,425	16,490	16,490	-	24,388	-	-	-	45,736
24.2	Capital Additions 85-2002	18	12	4	2	113	-	41	190	190	-	280	-	-	-	711
24.3	Containment Penetration Area	227	36	17	8	475	100	259	1,123	1,123	-	1,176	-	-	-	5,774
24.4	Fuel Handling	524	342	22	11	604	274	543	2,320	2,320	-	1,496	-	-	-	19,352
24	Totals	1,872	1,387	410	197	11,167	822	4,268	20,124	20,124	-	27,841	-	-	-	71,573
25	License Termination Survey	-	-	-	-	-	5,592	1,678	7,270	7,270	-	-	-	-	-	129,465
26	ORISE confirmatory survey	-	-	-	-	-	105	32	137	137	-	-	-	-	-	-
27	Terminate license	-	-	-	-	-	-	-	note 2	-	-	-	-	-	-	-
Period 4 Additional Costs																
28	Vessel & Internals GTCC Disposal	-	-	-	-	13,213	-	1,982	15,195	15,195	-	-	-	-	604	-
Subtotal Period 4 Activity Costs		2,485	41,312	7,049	2,063	51,518	36,448	33,144	167,018	164,000	3,019	75,914	3,521	534	604	811,515

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Period 4 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	699	-	-	-	-	-	175	874	874	-	-	-	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
4	Process liquid waste	271	-	101	267	745	-	372	1,756	1,756	-	-	1,844	-	-	363
5	Insurance	-	-	-	-	-	268	27	295	295	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	3,233	-	-	-	-	808	4,041	4,041	-	-	-	-	-	-
8	Heavy equipment rental	-	5,651	-	-	-	-	848	6,499	5,849	650	-	-	-	-	-
9	Small tool allowance	-	525	-	-	-	-	79	604	544	60	-	-	-	-	-
10	Pipe cutting equipment	-	911	-	-	-	-	137	1,048	1,048	-	-	-	-	-	-
11	Disposal of DAW generated	-	-	1,238	28	2,942	-	863	5,071	5,071	-	7,281	-	-	-	19,805
12	Decommissioning Equipment Disposition	-	-	8	4	231	480	131	855	855	-	572	-	-	-	778
13	Plant energy budget	-	-	-	-	-	1,206	181	1,387	1,248	139	-	-	-	-	-
14	NRC Fees	-	-	-	-	-	691	69	760	760	-	-	-	-	-	-
15	Site Security Cost	-	-	-	-	-	5,429	814	6,243	6,243	-	-	-	-	-	-
16	LLRW Processing Equipment	-	-	-	-	-	855	128	983	983	-	-	-	-	-	-
Subtotal Undistributed Costs Period 4		1,658	11,626	1,347	299	3,918	8,929	4,931	32,708	31,859	849	7,853	1,844	-	-	20,945
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	15,168	2,275	17,443	17,443	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	28,365	4,255	32,620	32,620	-	-	-	-	-	-
TOTAL PERIOD 4		4,143	45,938	8,396	2,362	55,436	88,910	44,605	249,790	245,922	3,868	83,767	5,365	584	604	835,460
PERIOD 5																
Demolition of Remaining Site Buildings																
29.1	Reactor	-	6,887	-	-	-	-	1,033	7,921	1,188	6,732	-	-	-	-	102,078
29.2	Capital Additions 85-2002	-	106	-	-	-	-	16	121	-	121	-	-	-	-	1,766
29.3	Containment Penetration Area	-	423	-	-	-	-	63	486	49	437	-	-	-	-	6,074
29.4	Fuel Handling	-	1,317	-	-	-	-	198	1,514	151	1,363	-	-	-	-	17,063
29.5	Miscellaneous	-	20	-	-	-	-	3	23	-	23	-	-	-	-	249
29.6	Turbine	-	2,512	-	-	-	-	377	2,888	-	2,888	-	-	-	-	42,836
29.7	Turbine Pedestal	-	938	-	-	-	-	141	1,079	-	1,079	-	-	-	-	11,300
29	Totals	-	12,202	-	-	-	-	1,830	14,032	1,388	12,644	-	-	-	-	181,367
Site Closeout Activities																
30	Grade & landscape site	-	1,395	-	-	-	-	209	1,605	-	1,605	-	-	-	-	4,587
31	Final report to NRC	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-
Subtotal Period 5 Activity Costs		-	13,597	-	-	-	125	2,058	15,780	1,532	14,249	-	-	-	-	185,953
Period 5 Undistributed Costs																
1	Insurance	-	-	-	-	-	65	6	71	71	-	-	-	-	-	-
2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	3,820	-	-	-	-	573	4,393	-	4,393	-	-	-	-	-
4	Small tool allowance	-	154	-	-	-	-	23	177	-	177	-	-	-	-	-
5	Plant energy budget	-	-	-	-	-	93	14	107	-	107	-	-	-	-	-
6	Site Security Cost	-	-	-	-	-	965	145	1,110	-	1,110	-	-	-	-	-
Subtotal Undistributed Costs Period 5		-	3,974	-	-	-	1,123	761	5,859	71	5,788	-	-	-	-	-
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	4,662	702	5,364	-	5,364	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	1,844	277	2,120	1,908	212	-	-	-	-	-
TOTAL PERIOD 5		-	17,572	-	-	-	7,773	3,798	29,143	3,511	25,632	-	-	-	-	185,953

TABLE D-1
DIABLO CANYON POWER PLANT UNIT 1
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
TOTAL COST TO DECOMMISSION		**7,547**	**66,530**	**9,726**	**2,645**	**60,244**	**347,434**	**89,325**	**583,451**	**552,938**	**30,513**	**93,981**	**7,051**	**584**	**604**	**1,099,379**

Total cost to decommission with	18.08%	contingency	$583,450,824	
Total NRC license termination cost is	94.77%	or	$552,937,506	
Non-nuclear demolition cost is	5.23%	or	$30,513,319	
Total burial site radwaste volume buried			101,616	cubic feet
Total 10CFR61 greater than class C waste buried			604	cubic feet
Total scrap metal released from site			12,215	tons
Total craft labor requirements			1,099,379	person hours

NOTES:

"0" indicates costs less than $500

1) This activity is performed by the decommissioning staff following plant shutdown; the costs for this are included in this period's staff cost.
2) This activity, while performed after final plant shutdown, is considered part of operations and therefore no decommissioning costs are included for this activity.

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 1																
1	SAFSTOR site characterization survey	-	-	-	-	-	279	84	362	362	-	-	-	-	-	-
2	Prepare preliminary decommissioning cost	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
3	Notification of Cessation of Operations	-	-	-	-	-	-	-	Note 2	-	-	-	-	-	-	-
4	*Remove fuel & source materials*	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
5	Notification of Permanent Defueling	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
7	Prepare and submit PSDAR	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
8	Review plant dwgs & specs.	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
9	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
10	Estimate by-product inventory	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
11	End product description	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
12	Detailed by-product inventory	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-
13	Define major work sequence	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
14	Perform SER and EA	-	-	-	-	-	248	37	285	285	-	-	-	-	-	-
15	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-
Activity Specifications																
16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	394	59	453	453	-	-	-	-	-	-
16.2	Plant systems	-	-	-	-	-	333	50	383	383	-	-	-	-	-	-
16.3	Plant structures and buildings	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-
16.4	Waste management	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
16.5	Facility and site dormancy	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-
16	Total	-	-	-	-	-	1,296	194	1,491	1,491	-	-	-	-	-	-
Detailed Work Procedures																
17.1	Plant systems	-	-	-	-	-	379	57	435	435	-	-	-	-	-	-
17.2	Facility closeout & dormancy	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-
17	Total	-	-	-	-	-	475	71	546	546	-	-	-	-	-	-
18	*Procure vacuum drying system*	-	-	-	-	-	8	1	9	9	-	-	-	-	-	-
19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
20	Drain & dry NSSS	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
22	Decon/secure contaminated systems	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
Decontamination of Site Buildings																
23.1	Reactor	1,136	-	-	-	-	-	568	1,704	1,704	-	-	-	-	-	26,111
23.2	Auxiliary	757	-	-	-	-	-	378	1,135	1,135	-	-	-	-	-	17,740
23.3	Capital Additions 85-2002	246	-	-	-	-	-	123	369	369	-	-	-	-	-	5,748
23.4	Containment Penetration Area	187	-	-	-	-	-	93	280	280	-	-	-	-	-	4,381
23.5	*Fuel Handling*	492	-	-	-	-	-	246	737	737	-	-	-	-	-	10,962
23	Totals	2,817	-	-	-	-	-	1,408	4,225	4,225	-	-	-	-	-	64,942
24	Prepare support equipment for storage	-	385	-	-	-	-	58	442	442	-	-	-	-	-	3,000
25	Install containment pressure equal. lines	-	34	-	-	-	-	5	39	39	-	-	-	-	-	700
26	Interim survey prior to dormancy	-	-	-	-	-	320	48	367	367	-	-	-	-	-	-
27	Secure building accesses	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
28	Prepare & submit interim report	-	-	-	-	-	47	7	54	54	-	-	-	-	-	-
Period 1 Additional Costs																
29	Hazardous Waste Management	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
30	*Mixed Waste Management*	-	-	-	-	-	557	84	641	641	-	-	-	-	-	-
31	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	700	105	805	805	-	-	-	-	-	-
32	Spent Fuel Loading Campaigns	-	-	-	-	-	130	20	150	150	-	-	-	-	-	-
33	Spent Fuel Ops & Maintenance	-	-	-	-	-	415	62	478	478	-	-	-	-	-	-
34	Spent Fuel Fixed Costs	-	-	-	-	-	831	125	956	956	-	-	-	-	-	-
35	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	196	29	225	225	-	-	-	-	-	-
36	Spent Fuel Pool Isolation	-	-	-	-	-	5,051	758	5,809	5,809	-	-	-	-	-	-

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Subtotal Period 1 Activity Costs		2,817	418	-	-	-	12,238	3,349	18,822	18,822	-	-	-	-	-	68,842
Period 1 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	1,108	-	-	-	-	-	277	1,385	1,385	-	-	-	-	-	-
3	Process liquid waste	263	-	98	259	723	-	361	1,705	1,705	-	-	1,791	-	-	352
4	Insurance	-	-	-	-	-	1,704	170	1,875	1,875	-	-	-	-	-	-
5	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Health physics supplies	-	485	-	-	-	-	121	607	607	-	-	-	-	-	-
7	Small tool allowance	-	54	-	-	-	-	8	62	62	-	-	-	-	-	-
8	Disposal of DAW generated	-	-	606	14	1,441	-	423	2,484	2,484	-	3,567	-	-	-	9,702
9	Plant energy budget	-	-	-	-	-	1,055	158	1,214	1,214	-	-	-	-	-	-
10	NRC ISFSI Fees	-	-	-	-	-	434	43	478	478	-	-	-	-	-	-
11	NRC Fees	-	-	-	-	-	245	25	270	270	-	-	-	-	-	-
12	Emergency Planning Fees	-	-	-	-	-	76	8	83	83	-	-	-	-	-	-
13	Site Security Cost	-	-	-	-	-	2,215	332	2,547	2,547	-	-	-	-	-	-
Subtotal Undistributed Costs Period 1		2,058	539	704	273	2,164	5,730	2,030	13,499	13,499	-	3,567	1,791	-	-	10,054
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	22,890	3,433	26,323	26,323	-	-	-	-	-	-
TOTAL COST TO SAFSTOR		4,875	957	704	273	2,164	40,858	8,812	58,644	58,644	-	3,567	1,791	-	-	78,896
PERIOD 2: Safstor Annual Maintenance Cost																
1	Quarterly Inspection	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
2	Semi-annual environmental survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
3	Prepare reports	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
4	Health physics supplies	-	-	-	-	-	56	14	70	70	-	-	-	-	-	-
5	Insurance	-	-	-	-	-	112	11	124	124	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Disposal of contaminated solid waste	-	-	2	0	41	-	11	54	54	-	102	-	-	-	28
8	Bituminous roof replacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Maintenance supplies	-	-	-	-	-	120	30	150	150	-	-	-	-	-	-
10	Plant energy budget	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-
11	NRC ISFSI Fees	-	-	-	-	-	55	5	60	60	-	-	-	-	-	-
12	NRC Fees	-	-	-	-	-	117	12	129	129	-	-	-	-	-	-
13	Emergency Planning Fees	-	-	-	-	-	24	2	27	27	-	-	-	-	-	-
14	Site Security Cost	-	-	-	-	-	785	118	903	903	-	-	-	-	-	-
15	Site maintenance staff	-	-	-	-	-	1,847	277	2,124	2,124	-	-	-	-	-	-
Period 2 Additional Costs																
16	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	1,149	172	1,322	1,322	-	-	-	-	-	-
17	Spent Fuel Loading Campaigns	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-
18	Spent Fuel Ops & Maintenance	-	-	-	-	-	53	8	60	60	-	-	-	-	-	-
19	Spent Fuel Fixed Costs	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-
20	Spent Fuel Security	-	-	-	-	-	30	4	34	34	-	-	-	-	-	-
21	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-
PERIOD 2 ANNUAL MAINTENANCE TOTALS		-	-	2	0	41	4,775	729	5,547	5,547	-	102	-	-	-	28

MAINTENANCE COST FOR 29.31833 YEARS DORMANCY: $162,632,432

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
PERIOD 3																
1	Review plant dwgs & specs.	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
2	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
3	End product description	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
4	Detailed by-product inventory	-	-	-	-	-	104	16	120	120	-	-	-	-	-	-
5	Define major work sequence	-	-	-	-	-	600	90	690	690	-	-	-	-	-	-
6	Perform SER and EA	-	-	-	-	-	248	37	285	285	-	-	-	-	-	-
7	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-
8	Prepare/submit License Termination Plan	-	-	-	-	-	328	49	377	377	-	-	-	-	-	-
9	Receive NRC approval of termination plan	-	-	-	-	-	-	-	Note 1	-	-	-	-	-	-	-
Activity Specifications																
10.1	Re-activate plant & temporary facilities	-	-	-	-	-	589	88	678	610	68	-	-	-	-	-
10.2	Plant systems	-	-	-	-	-	333	50	383	345	38	-	-	-	-	-
10.3	Reactor internals	-	-	-	-	-	568	85	653	653	-	-	-	-	-	-
10.4	Reactor vessel	-	-	-	-	-	520	78	598	598	-	-	-	-	-	-
10.5	Biological shield	-	-	-	-	-	40	6	46	46	-	-	-	-	-	-
10.6	Steam generators	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-
10.7	Reinforced concrete	-	-	-	-	-	128	19	147	74	74	-	-	-	-	-
10.8	Turbine & condenser	-	-	-	-	-	64	10	74	-	74	-	-	-	-	-
10.9	Plant structures & buildings	-	-	-	-	-	250	37	287	143	143	-	-	-	-	-
10.10	Waste management	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
10.11	Facility & site closeout	-	-	-	-	-	72	11	83	41	41	-	-	-	-	-
10	Total	-	-	-	-	-	3,181	477	3,659	3,220	438	-	-	-	-	-
Planning & Site Preparations																
11	Prepare dismantling sequence	-	-	-	-	-	192	29	221	221	-	-	-	-	-	-
12	Plant prep. & temp. svces	-	-	-	-	-	2,304	346	2,650	2,650	-	-	-	-	-	-
13	Design water clean-up system	-	-	-	-	-	112	17	129	129	-	-	-	-	-	-
14	Rigging/CCEs/tooling/etc.	-	-	-	-	-	1,950	293	2,243	2,243	-	-	-	-	-	-
15	Procure casks/liners & containers	-	-	-	-	-	98	15	113	113	-	-	-	-	-	-
Detailed Work Procedures																
16.1	Plant systems	-	-	-	-	-	379	57	435	392	44	-	-	-	-	-
16.2	Vessel head	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
16.3	Reactor internals	-	-	-	-	-	200	30	230	230	-	-	-	-	-	-
16.4	Remaining buildings	-	-	-	-	-	108	16	124	31	93	-	-	-	-	-
16.5	CRD cooling assembly	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
16.6	CRD housings & ICI tubes	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
16.7	Incore instrumentation	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-
16.8	Reactor vessel	-	-	-	-	-	290	44	334	334	-	-	-	-	-	-
16.9	Facility closeout	-	-	-	-	-	96	14	110	55	55	-	-	-	-	-
16.10	Missile shields	-	-	-	-	-	36	5	41	41	-	-	-	-	-	-
16.11	Biological shield	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-
16.12	Steam generators	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-
16.13	Reinforced concrete	-	-	-	-	-	80	12	92	46	46	-	-	-	-	-
16.14	Turbine & condensers	-	-	-	-	-	250	37	287	-	287	-	-	-	-	-
16.15	Auxiliary building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
16.16	Reactor building	-	-	-	-	-	218	33	251	226	25	-	-	-	-	-
16	Total	-	-	-	-	-	2,779	417	3,196	2,621	575	-	-	-	-	-
Period 3 Additional Costs																
17	Site Characterization	-	-	-	-	-	1,011	303	1,314	1,314	-	-	-	-	-	12,588
Subtotal Period 3 Activity Costs		-	-	-	-	-	13,754	2,215	15,969	14,956	1,013	-	-	-		12,588

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Period 3 Undistributed Costs																
1	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
2	Insurance	-	-	-	-	-	146	15	161	161	-	-	-	-	-	-
3	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Health physics supplies	-	300	-	-	-	-	75	375	375	-	-	-	-	-	-
5	Heavy equipment rental	-	553	-	-	-	-	83	635	635	-	-	-	-	-	-
6	Disposal of DAW generated	-	-	606	14	1,441	-	423	2,484	2,484	-	3,567	-	-	-	9,702
7	Plant energy budget	-	-	-	-	-	1,166	175	1,341	1,341	-	-	-	-	-	-
8	NRC Fees	-	-	-	-	-	245	25	270	270	-	-	-	-	-	-
9	Site Security Cost	-	-	-	-	-	941	141	1,082	1,082	-	-	-	-	-	-
Subtotal Undistributed Costs Period 3		-	2,158	606	14	1,441	2,498	1,132	7,849	7,849	-	3,567	-	-	-	9,702
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	6,112	917	7,029	7,029	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	12,242	1,836	14,078	14,078	-	-	-	-	-	-
TOTAL PERIOD 3 COST		-	2,158	606	14	1,441	34,807	6,100	44,926	43,913	1,013	3,567	-	-	-	22,290
PERIOD 4																
Nuclear Steam Supply System Removal																
18.1	Reactor Coolant Piping	21	179	7	3	173	9	101	492	492	-	429	-	-	-	4,849
18.2	Pressurizer Relief Tank	5	20	8	3	226	7	66	336	336	-	559	-	-	-	602
18.3	Reactor Coolant Pumps & Motors	19	69	35	12	1,653	261	485	2,533	2,533	-	4,091	-	-	-	1,995
18.4	Pressurizer	38	34	362	313	905	-	337	1,988	1,988	-	2,318	-	-	-	1,667
18.5	Steam Generators	67	2,839	1,895	792	11,894	2,485	4,398	24,371	24,371	-	22,200	-	-	-	24,566
18.6	CRDMs/ICIs/Service Structure Removal	15	58	91	8	1,061	-	297	1,528	1,528	-	2,627	-	-	-	1,636
18.7	Reactor Vessel Internals	47	936	3,709	378	3,395	-	3,445	11,909	11,909	-	2,407	376	584	-	7,773
18.8	Reactor Vessel	71	2,809	423	294	5,006	-	4,824	13,427	13,427	-	6,481	3,145	-	-	21,808
18	Totals	283	6,942	6,531	1,802	24,313	2,762	13,952	56,585	56,585	-	41,112	3,521	584	-	64,897
19	Remove spent fuel racks	323	36	18	2	1,034	337	481	2,230	2,230	-	2,558	-	-	-	8,448
Removal of Major Equipment																
20	Main Turbine/Generator	-	362	-	-	-	723	199	1,283	1,283	-	-	-	-	-	8,244
21	Main Condensers	-	1,067	-	-	-	827	391	2,285	2,285	-	-	-	-	-	24,147
Disposal of Plant Systems																
22.1	Auxiliary Steam	-	122	-	-	-	198	60	380	380	-	-	-	-	-	2,751
22.2	Auxiliary Steam (RCA)	-	117	-	-	-	93	43	253	253	-	-	-	-	-	2,707
22.3	Building Services (Non-Power Block)	-	5	-	-	-	-	1	5	-	5	-	-	-	-	106
22.4	Capital Additions 85-2002 (Clean)	-	638	-	-	-	-	96	733	-	733	-	-	-	-	14,662
22.5	Capital Additions 85-2002 (contaminated)	-	395	-	-	-	260	138	793	793	-	-	-	-	-	9,009
22.6	Chemical & Volume Control	-	698	16	7	447	430	354	1,952	1,952	-	1,107	-	-	-	16,279
22.7	Chemical & Volume Control (Insulated)	-	318	6	3	167	49	130	672	672	-	412	-	-	-	7,454
22.8	Component Cooling Water	-	124	-	-	-	-	19	143	-	143	-	-	-	-	2,984
22.9	Component Cooling Water (RCA)	-	528	-	-	-	691	236	1,455	1,455	-	-	-	-	-	12,322
22.10	Compressed Air	-	77	-	-	-	-	11	88	-	88	-	-	-	-	1,881
22.11	Compressed Air (Insulated)	-	4	-	-	-	-	1	5	-	5	-	-	-	-	99
22.12	Compressed Air (RCA Insulated)	-	22	-	-	-	9	7	37	37	-	-	-	-	-	513
22.13	Compressed Air (RCA)	-	387	-	-	-	167	122	676	676	-	-	-	-	-	9,116
22.14	Condensate System	-	1,011	-	-	-	3,525	781	5,317	5,317	-	-	-	-	-	22,930
22.15	Condensate System (Insulated)	-	345	-	-	-	1,166	261	1,772	1,772	-	-	-	-	-	7,832
22.16	Containment Spray	-	187	-	-	-	541	128	856	856	-	-	-	-	-	4,348
22.17	Diesel Engine-Generator	-	74	-	-	-	-	11	85	-	85	-	-	-	-	1,719
22.18	Diesel Engine-Generator (Insulated)	-	2	-	-	-	-	0	2	-	2	-	-	-	-	48
22.19	Electrical (Clean)	-	2,058	-	-	-	-	309	2,366	-	2,366	-	-	-	-	47,918
22.20	Electrical (Contaminated)	-	333	-	-	-	201	113	648	648	-	-	-	-	-	7,804
22.21	Electrical (Contaminated) - FHB	-	103	-	-	-	38	31	172	172	-	-	-	-	-	2,452
22.22	Electrical (RCA)	-	2,222	-	-	-	1,656	804	4,682	4,682	-	-	-	-	-	52,102
22.23	Electrical (RCA)-FHB	-	691	-	-	-	342	224	1,257	1,257	-	-	-	-	-	16,220

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Disposal of Plant Systems (cont)																
22.24	Extraction Steam & Heater Drip	-	402	-	-	-	887	234	1,522	1,522	-	-	-	-	-	9,195
22.25	Feedwater System	-	75	-	-	-	723	127	925	925	-	-	-	-	-	1,711
22.26	Feedwater System (Insulated)	-	106	-	-	-	-	16	122	-	122	-	-	-	-	2,547
22.27	Feedwater System (RCA Insulated)	-	107	-	-	-	155	50	311	311	-	-	-	-	-	2,521
22.28	Feedwater System (RCA)	-	5	-	-	-	8	2	16	16	-	-	-	-	-	118
22.29	Fire Protection	-	245	-	-	-	590	150	986	986	-	-	-	-	-	5,590
22.30	Fire Protection (RCA)	-	203	-	-	-	175	77	454	454	-	-	-	-	-	4,668
22.31	Gaseous Radwaste	-	96	-	-	-	68	34	198	198	-	-	-	-	-	2,236
22.32	HVAC (Clean Insulated)	-	26	-	-	-	-	4	30	-	30	-	-	-	-	662
22.33	HVAC (Clean)	-	274	-	-	-	-	41	315	-	315	-	-	-	-	6,878
22.34	HVAC (Contaminated Insulated)	-	197	-	-	-	166	74	437	437	-	-	-	-	-	4,025
22.35	HVAC (Contaminated)	-	845	-	-	-	639	337	2,021	2,021	-	-	-	-	-	17,417
22.36	HVAC (Contaminated) - FHB	-	191	-	-	-	177	74	443	443	-	-	-	-	-	3,929
22.37	Liquid Radwaste	-	285	9	4	250	172	161	881	881	-	618	-	-	-	8,662
22.38	Liquid Radwaste (Insulated)	-	31	1	0	22	3	14	71	71	-	53	-	-	-	735
22.39	Lube Oil Distribution & Purification	-	188	-	-	-	269	87	545	545	-	-	-	-	-	4,239
22.40	Make-up Water	-	161	-	-	-	-	24	185	-	185	-	-	-	-	3,794
22.41	Make-up Water (Insulated)	-	15	-	-	-	-	2	18	-	18	-	-	-	-	376
22.42	Make-up Water (RCA Insulated)	-	25	-	-	-	19	9	54	54	-	-	-	-	-	586
22.43	Make-up Water (RCA)	-	125	-	-	-	109	48	282	282	-	-	-	-	-	2,884
22.44	Mechanical Department Equipment	-	1	-	-	-	-	0	1	-	1	-	-	-	-	19
22.45	Miscellaneous Reactor Coolant	-	87	1	0	27	31	28	154	154	-	67	-	-	-	1,598
22.46	NSSS Sampling	-	85	2	1	49	12	36	185	185	-	122	-	-	-	2,152
22.47	NSSS Sampling (Insulated)	-	25	0	0	8	-	8	41	41	-	19	-	-	-	642
22.48	Nitrogen & Hydrogen	-	13	-	-	-	-	2	14	-	14	-	-	-	-	309
22.49	Nitrogen & Hydrogen (Insulated)	-	1	-	-	-	-	0	1	-	1	-	-	-	-	18
22.50	Nitrogen & Hydrogen (RCA Insulated)	-	4	-	-	-	1	1	7	7	-	-	-	-	-	98
22.51	Nitrogen & Hydrogen (RCA)	-	79	-	-	-	27	24	129	129	-	-	-	-	-	1,853
22.52	Nuclear Steam Supply Sampling	-	17	-	-	-	6	5	28	28	-	-	-	-	-	395
22.53	Nuclear Steam Supply Sampling (Insulated	-	7	-	-	-	3	2	12	12	-	-	-	-	-	169
22.54	Oily Water Separator & TB Sump	-	20	-	-	-	33	10	62	62	-	-	-	-	-	441
22.55	Residual Heat Removal	-	229	11	5	301	465	204	1,215	1,215	-	746	-	-	-	5,409
22.56	Safety Injection	-	82	-	-	-	78	32	192	192	-	-	-	-	-	1,918
22.57	Safety Injection (Insulated)	-	4	-	-	-	3	2	9	9	-	-	-	-	-	105
22.58	Safety Injection (RCA Insulated)	-	36	-	-	-	26	13	77	77	-	-	-	-	-	831
22.59	Safety Injection (RCA)	-	294	-	-	-	250	111	655	655	-	-	-	-	-	6,766
22.60	Saltwater System	-	120	-	-	-	-	18	138	-	138	-	-	-	-	2,779
22.61	Service Cooling Water	-	90	-	-	-	-	14	104	-	104	-	-	-	-	2,186
22.62	Service Cooling Water (RCA)	-	30	-	-	-	28	12	70	70	-	-	-	-	-	698
22.63	Sewer System Expansion	-	31	-	-	-	-	5	36	-	36	-	-	-	-	746
22.64	Spent Fuel Pit Cooling	-	58	3	1	89	190	66	407	407	-	219	-	-	-	1,383
22.65	Spent Fuel Pit Cooling - FHB	-	81	4	2	104	201	77	468	468	-	257	-	-	-	1,894
22.66	Turbine Steam Supply	-	1,157	-	-	-	4,610	981	6,748	6,748	-	-	-	-	-	26,820
22.67	Turbine Steam Supply (RCA)	-	803	-	-	-	1,234	386	2,422	2,422	-	-	-	-	-	18,952
22.68	Turbine and Generator	-	102	-	-	-	250	63	416	416	-	-	-	-	-	2,299
22.69	Turbine and Generator (Insulated)	-	46	-	-	-	46	18	111	111	-	-	-	-	-	1,037
22	Totals	-	17,544	52	24	1,463	21,222	7,562	47,867	43,475	4,391	3,621	-	-	-	305,409
23	Erect scaffolding for systems removal	-	7,679	4	1	111	292	1,992	10,081	10,081	-	276	-	-	-	72,503
Decontamination of Site Buildings																
24.1	Reactor	1,104	997	366	176	9,974	449	3,425	16,490	16,490	-	24,688	-	-	-	45,737
24.2	Auxiliary	922	91	71	34	1,942	192	1,010	4,263	4,263	-	4,807	-	-	-	22,031
24.3	Capital Additions 85-2002	278	12	10	6	531	-	277	1,124	1,124	-	1,315	-	-	-	6,315
24.4	Containment Penetration Area	227	36	17	8	475	100	259	1,123	1,123	-	1,176	-	-	-	5,774
24.5	Fuel Handling	524	342	22	11	604	274	543	2,320	2,320	-	1,496	-	-	-	19,352
24.6	Radwaste Storage	25	5	8	4	213	6	69	330	330	-	526	-	-	-	536
24	Totals	3,077	1,483	504	241	13,739	1,021	5,584	25,649	25,649	-	34,008	-	-	-	99,716

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
25	License Termination Survey	-	-	-	-	-	9,074	2,722	11,796	11,796	-	-	-	-	-	217,991
26	ORISE confirmatory survey	-	-	-	-	-	105	32	137	137	-	-	-	-	-	-
27	Terminate license	-	-	-	-	-	-	-	Note 2	-	-	-	-	-	-	-
Period 4 Additional Costs																
28	Vessel & Internals GTCC Disposal	-	-	-	-	13,213	-	1,982	15,195	15,195	-	-	-	-	604	-
29	ISFSI License Termination	26	2,179	54	17	1,063	1,152	1,004	5,496	5,496	-	2,832	-	-	-	40,148
30	ISFSI Demolition	-	1,557	-	-	-	34	239	1,830	-	1,830	-	-	-	-	9,494
Subtotal Period 4 Activity Costs		3,708	38,848	7,163	2,088	54,936	37,550	36,140	180,432	174,211	6,221	84,207	3,521	584	604	951,025
Period 4 Undistributed Costs																
1	Decon equipment	687	-	-	-	-	-	103	790	790	-	-	-	-	-	-
2	Decon supplies	1,148	-	-	-	-	-	287	1,436	1,436	-	-	-	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	1,502	-	-	-	-	-	-
4	Process liquid waste	294	-	110	290	809	-	404	1,906	1,906	-	-	2,003	-	-	394
5	Insurance	-	-	-	-	-	253	25	278	278	-	-	-	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	3,658	-	-	-	-	914	4,572	4,572	-	-	-	-	-	-
8	Heavy equipment rental	-	5,368	-	-	-	-	805	6,173	5,556	617	-	-	-	-	-
9	Small tool allowance	-	562	-	-	-	-	84	646	562	65	-	-	-	-	-
10	Pipe cutting equipment	-	911	-	-	-	-	137	1,048	1,048	-	-	-	-	-	-
11	Disposal of DAW generated	-	-	1,200	27	2,851	-	837	4,915	4,915	-	7,056	-	-	-	19,193
12	Decommissioning Equipment Disposition	-	-	8	4	231	480	131	855	855	-	572	-	-	-	776
13	Plant energy budget	-	-	-	-	-	1,724	259	1,983	1,785	198	-	-	-	-	-
14	NRC Fees	-	-	-	-	-	656	66	722	722	-	-	-	-	-	-
15	Site Security Cost	-	-	-	-	-	6,282	942	7,225	7,225	-	-	-	-	-	-
16	LLRW Processing Equipment	-	-	-	-	-	798	120	918	918	-	-	-	-	-	-
Subtotal Undistributed Costs Period 4		2,130	11,804	1,318	321	3,891	10,194	5,310	34,969	34,088	880	7,628	2,003	-	-	20,365
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	18,791	2,819	21,609	21,609	-	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	36,957	5,544	42,500	42,500	-	-	-	-	-	-
TOTAL PERIOD 4		5,839	50,652	8,480	2,409	58,827	103,492	49,812	279,510	272,409	7,102	91,835	5,523	584	604	971,390
PERIOD 5																
Demolition of Remaining Site Buildings																
31.1	Reactor	-	6,887	-	-	-	-	1,033	7,921	1,188	6,732	-	-	-	-	102,078
31.2	Administration	-	793	-	-	-	-	119	912	-	912	-	-	-	-	10,358
31.3	Auxiliary	-	5,449	-	-	-	-	817	6,266	627	5,639	-	-	-	-	82,811
31.4	Breakwater	-	35,437	-	-	-	-	5,316	40,752	-	40,752	-	-	-	-	118,381
31.5	Capital Additions 85-2002	-	3,410	-	-	-	-	512	3,922	-	3,922	-	-	-	-	51,043
31.6	Chemical Storage	-	3	-	-	-	-	1	4	-	4	-	-	-	-	46
31.7	Chlorination	-	7	-	-	-	-	1	8	-	8	-	-	-	-	97
31.8	Circulating Water Tunnels	-	1,035	-	-	-	-	155	1,190	-	1,190	-	-	-	-	20,361
31.9	Cold Machine Shop	-	290	-	-	-	-	43	333	-	333	-	-	-	-	3,779
31.10	Communication	-	3	-	-	-	-	0	4	-	4	-	-	-	-	44
31.11	Condensate Polishing/Technical Support	-	386	-	-	-	-	58	444	-	444	-	-	-	-	6,959
31.12	Containment Penetration Area	-	423	-	-	-	-	63	486	49	438	-	-	-	-	6,077
31.13	Discharge Structure	-	756	-	-	-	-	113	869	-	869	-	-	-	-	8,052
31.14	Fabrication Shop	-	92	-	-	-	-	14	106	-	106	-	-	-	-	1,223
31.15	Fire Pump House	-	4	-	-	-	-	1	5	-	5	-	-	-	-	55
31.16	Fuel Handling	-	1,276	-	-	-	-	191	1,468	147	1,321	-	-	-	-	18,457
31.17	Hazardous Waste Storage Facility	-	1,360	-	-	-	-	204	1,564	-	1,564	-	-	-	-	417
31.18	Intake Structure	-	4,296	-	-	-	-	644	4,940	-	4,940	-	-	-	-	46,342
31.19	Maintenance Shop	-	266	-	-	-	-	40	306	-	306	-	-	-	-	3,444
31.20	Miscellaneous Structures	-	51	-	-	-	-	8	58	-	58	-	-	-	-	703

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
Demolition of Remaining Site Buildings (cont)																
31.21	NPO Permanent Warehouse	-	1,057	-	-	-	-	159	1,216	-	1,216	-	-	-	-	14,092
31.22	Ponds	-	1	-	-	-	-	0	1	-	1	-	-	-	-	18
31.23	Portable Fire Pump & Fuel Cart	-	1	-	-	-	-	0	1	-	1	-	-	-	-	14
31.24	Pretreatment	-	8	-	-	-	-	1	9	-	9	-	-	-	-	108
31.25	Radwaste Storage	-	1,403	-	-	-	-	210	1,613	81	1,533	-	-	-	-	18,420
31.26	Rotor Warhouse	-	717	-	-	-	-	107	824	-	824	-	-	-	-	9,938
31.27	Security	-	286	-	-	-	-	43	329	-	329	-	-	-	-	3,942
31.28	Simulator	-	316	-	-	-	-	47	364	-	364	-	-	-	-	4,191
31.29	Telephone Terminal	-	2	-	-	-	-	0	2	-	2	-	-	-	-	28
31.30	Turbine	-	3,466	-	-	-	-	520	3,986	-	3,986	-	-	-	-	58,341
31.31	Turbine Pedestal	-	938	-	-	-	-	141	1,079	-	1,079	-	-	-	-	11,300
31.32	Vehicle Maintenance	-	27	-	-	-	-	4	31	-	31	-	-	-	-	366
31.33	Waste Water Holding & Treatment Facility	-	18	-	-	-	-	3	20	-	20	-	-	-	-	238
31	Totals	-	70,464	-	-	-	-	10,570	81,034	2,091	78,943	-	-	-	-	601,721
Site Closeout Activities																
32	Remove Rubble	-	108,505	-	-	-	-	16,276	124,781	-	124,781	-	-	-	-	184,226
33	Grade & landscape site	-	1,395	-	-	-	-	209	1,605	-	1,605	-	-	-	-	4,587
34	Final report to NRC	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-
Subtotal Period 5 Activity Costs		-	180,364	-	-	-	125	27,073	207,562	2,234	205,328	-	-	-	-	790,534
Period 5 Undistributed Costs																
1	Insurance	-	-	-	-	-	100	10	110	110	-	-	-	-	-	-
2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	3,820	-	-	-	-	573	4,393	-	4,393	-	-	-	-	-
4	Small tool allowance	-	649	-	-	-	-	97	746	-	746	-	-	-	-	-
5	Plant energy budget	-	-	-	-	-	136	20	157	-	157	-	-	-	-	-
6	Site Security Cost	-	-	-	-	-	1,493	224	1,717	-	1,717	-	-	-	-	-
Subtotal Undistributed Costs Period 5		-	4,470	-	-	-	1,730	925	7,124	110	7,014	-	-	-	-	-
Staff Costs																
	DOC Staff Cost	-	-	-	-	-	9,994	1,499	11,493	-	11,493	-	-	-	-	-
	Utility Staff Cost	-	-	-	-	-	6,653	998	7,651	6,886	765	-	-	-	-	-
TOTAL PERIOD 5		-	184,834	-	-	-	18,501	30,495	233,830	9,230	224,600	-	-	-	-	790,534

TABLE D-2
DIABLO CANYON POWER PLANT UNIT 2
SAFSTOR DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	NRC LicTerm	Site Restore	Burial site A CF	Burial site B CF	Burial site C CF	10 CFR 61 GTCC CF	Craft Labor Hours
TOTAL COST TO DECOMMISSION		10,714	238,801	9,836	2,707	63,639	337,457	116,588	779,543	546,828	232,715	101,957	7,314	584	604	1,863,721

Total cost to decommission with	17.59%	contingency	$779,542,846	
Total NRC license termination cost is	70.15%	or	$546,828,119	
Non-nuclear demolition cost is	29.85%	or	$232,714,727	
Total burial site radwaste volume buried			109,855	cubic feet
Total 10CFR61 greater than class C waste buried			604	cubic feet
Total scrap metal released from site			22,080	tons
Total craft labor requirements			1,863,721	person hours

NOTES:

"0" indicates costs less than $500

1) This activity is performed by the decommissioning staff following plant shutdown; the costs for this are included in this period's staff cost.
2) This activity, while performed after final plant shutdown, is considered part of operations and therefore no decommissioning costs are included for this activity.

Decommissioning Cost Estimate in 2005 Dollars

TLG Services, Inc. Decommissioning Cost Study for the Diablo Canyon Power Plant Units 1 and 2
Appendix C: Tables C-1 and C-2

Decommissioning Cost Estimate in 2005 Dollars

TLG Services, Inc. Decommissioning Cost Study for the Diablo Canyon Power Plant Units 1 and 2 Appendix C: Tables C-1 and C-2

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
PERIOD 1												
1	Prepare preliminary decommissioning cost	-	-	-	-	-	104	16	120	-	-	-
2	Notification of Cessation of Operations	-	-	-	-	-	-	-	Note 1	-	-	-
3	Remove fuel & source material	-	-	-	-	-	-	-	Note 2	-	-	-
4	Notification of Permanent Defueling	-	-	-	-	-	-	-	Note 1	-	-	-
5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	Note 1	-	-	-
6	Prepare and submit PSDAR	-	-	-	-	-	160	24	184	-	-	-
7	Review plant dwgs & specs.	-	-	-	-	-	368	55	423	-	-	-
8	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-
9	Estimate by-product inventory	-	-	-	-	-	80	12	92	-	-	-
10	End product description	-	-	-	-	-	80	12	92	-	-	-
11	Detailed by-product inventory	-	-	-	-	-	104	16	120	-	-	-
12	Define major work sequence	-	-	-	-	-	600	90	690	-	-	-
13	Perform SER and EA	-	-	-	-	-	248	37	285	-	-	-
14	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	-	-	-
15	Prepare/submit License Termination Plan	-	-	-	-	-	328	49	377	-	-	-
16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	Note 1	-	-	-
Activity Specifications												
17.1	Plant & temporary facilities	-	-	-	-	-	394	59	453	-	-	-
17.2	Plant systems	-	-	-	-	-	333	50	383	-	-	-
17.3	NSSS Decontamination Flush	-	-	-	-	-	40	6	46	-	-	-
17.4	Reactor internals	-	-	-	-	-	568	85	653	-	-	-
17.5	Reactor vessel	-	-	-	-	-	520	78	598	-	-	-
17.6	Biological shield	-	-	-	-	-	40	6	46	-	-	-
17.7	Steam generators	-	-	-	-	-	250	37	287	-	-	-
17.8	Reinforced concrete	-	-	-	-	-	128	19	147	-	-	-
17.9	Turbine & condenser	-	-	-	-	-	64	10	74	-	-	-
17.10	Plant structures & buildings	-	-	-	-	-	250	37	287	-	-	-
17.11	Waste management	-	-	-	-	-	368	55	423	-	-	-
17.12	Facility & site closeout	-	-	-	-	-	72	11	83	-	-	-
17	Total	-	-	-	-	-	3,025	454	3,479	-	-	-
Planning & Site Preparations												
18	Prepare dismantling sequence	-	-	-	-	-	192	29	221	-	-	-
19	Plant prep. & temp. svces	-	-	-	-	-	2,304	346	2,650	-	-	-
20	Design water clean-up system	-	-	-	-	-	112	17	129	-	-	-
21	Rigging/CCEs/tooling/etc.	-	-	-	-	-	1,950	293	2,243	-	-	-
22	Procure casks/liners & containers	-	-	-	-	-	98	15	113	-	-	-
Detailed Work Procedures												
23.1	Plant systems	-	-	-	-	-	379	57	435	-	-	-
23.2	NSSS Decontamination Flush	-	-	-	-	-	80	12	92	-	-	-
23.3	Vessel head	-	-	-	-	-	200	30	230	-	-	-
23.4	Reactor internals	-	-	-	-	-	200	30	230	-	-	-
23.5	Remaining buildings	-	-	-	-	-	108	16	124	-	-	-
23.6	CRD cooling assembly	-	-	-	-	-	80	12	92	-	-	-
23.7	CRD housings & ICI tubes	-	-	-	-	-	80	12	92	-	-	-
23.8	Incore instrumentation	-	-	-	-	-	80	12	92	-	-	-
23.9	Reactor vessel	-	-	-	-	-	290	44	334	-	-	-
23.10	Facility closeout	-	-	-	-	-	96	14	110	-	-	-
23.11	Missile shields	-	-	-	-	-	36	5	41	-	-	-
23.12	Biological shield	-	-	-	-	-	96	14	110	-	-	-
23.13	Steam generators	-	-	-	-	-	368	55	423	-	-	-
23.14	Reinforced concrete	-	-	-	-	-	80	12	92	-	-	-
23.15	Turbine & condensers	-	-	-	-	-	250	37	287	-	-	-

DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
-	-	-	-	-	117	41	158
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	181	63	244
-	-	-	-	-	415	145	561
-	-	-	-	-	-	-	-
-	-	-	-	-	90	32	122
-	-	-	-	-	90	32	122
-	-	-	-	-	117	41	158
-	-	-	-	-	677	237	914
-	-	-	-	-	280	98	378
-	-	-	-	-	451	158	609
-	-	-	-	-	370	129	499
-	-	-	-	-	-	-	-
-	-	-	-	-	444	155	600
-	-	-	-	-	376	132	508
-	-	-	-	-	45	16	61
-	-	-	-	-	641	224	865
-	-	-	-	-	587	205	792
-	-	-	-	-	45	16	61
-	-	-	-	-	282	99	380
-	-	-	-	-	144	51	195
-	-	-	-	-	72	25	98
-	-	-	-	-	282	99	380
-	-	-	-	-	415	145	561
-	-	-	-	-	81	28	110
-	-	-	-	-	3,415	1,195	4,611
-	-	-	-	-	217	76	293
-	-	-	-	-	2,601	910	3,511
-	-	-	-	-	126	44	171
-	-	-	-	-	2,201	771	2,972
-	-	-	-	-	111	39	150
-	-	-	-	-	427	150	577
-	-	-	-	-	90	32	122
-	-	-	-	-	226	79	305
-	-	-	-	-	226	79	305
-	-	-	-	-	122	43	165
-	-	-	-	-	90	32	122
-	-	-	-	-	90	32	122
-	-	-	-	-	90	32	122
-	-	-	-	-	328	115	442
-	-	-	-	-	108	38	146
-	-	-	-	-	41	14	55
-	-	-	-	-	108	38	146
-	-	-	-	-	415	145	561
-	-	-	-	-	90	32	122
-	-	-	-	-	282	99	380

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
23.16	Auxiliary building	-	-	-	-	-	218	33	251	-	-	-
23.17	Reactor building	-	-	-	-	-	218	33	251	-	-	-
23	Total	-	-	-	-	-	2,859	429	3,288	-	-	-
0												
24	Decon primary loop	1,610	-	-	-	-	-	805	2,416	-	-	-
Period 1 Additional Costs												
25	Hazardous Waste Management	-	-	-	-	-	557	84	641	-	-	-
26	Mixed Waste Management	-	-	-	-	-	557	84	641	-	-	-
27	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	158	24	182	-	-	-
28	Spent Fuel Loading Campaigns	-	-	-	-	-	29	4	34	-	-	-
29	Spent Fuel Ops & Maintenance	-	-	-	-	-	25	4	28	-	-	-
30	Spent Fuel Fixed Costs	-	-	-	-	-	49	7	56	-	-	-
31	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	196	29	225	-	-	-
32	Spent Fuel Pool Isolation	-	-	-	-	-	7,577	1,137	8,714	-	-	-
33	Site Characterization	-	-	-	-	-	1,011	303	1,314	-	-	-
Subtotal Period 1 Activity Costs		1,610	-	-	-	-	23,171	4,432	29,214	-	-	-
Period 1 Undistributed Costs												
1	Decon equipment	687	-	-	-	-	-	103	790	-	-	-
2	Decon supplies	41	-	-	-	-	-	10	52	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	-	-	-
4	Process liquid waste	105	-	742	862	3,497	-	1,130	6,336	-	8,656	-
5	Insurance	-	-	-	-	-	3,564	356	3,920	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	302	-	-	-	-	76	378	-	-	-
8	Heavy equipment rental	-	261	-	-	-	-	39	300	-	-	-
9	Small tool allowance	-	12	-	-	-	-	2	14	-	-	-
10	Disposal of DAW generated	-	-	590	14	1,412	-	414	2,430	3,496	-	-
11	Plant energy budget	-	-	-	-	-	876	131	1,008	-	-	-
12	NRC ISFSI Fees	-	-	-	-	-	26	3	28	-	-	-
13	NRC Fees	-	-	-	-	-	404	40	445	-	-	-
14	Emergency Planning Fees	-	-	-	-	-	76	8	83	-	-	-
15	Site Security Cost	-	-	-	-	-	2,215	332	2,547	-	-	-
Subtotal Undistributed Costs Period 1		834	1,882	1,332	875	4,909	7,161	2,841	19,834	3,496	8,656	-
Staff Costs												
0	DOC Staff Cost	-	-	-	-	-	6,340	951	7,291	-	-	-
	Utility Staff Cost	-	-	-	-	-	26,166	3,925	30,091	-	-	-
0												
TOTAL PERIOD 1 COST		2,445	1,882	1,332	875	4,909	62,838	12,150	86,430	3,496	8,656	-
PERIOD 2												
0												
Nuclear Steam Supply System Removal												
34.1	Reactor Coolant Piping	100	198	8	8	193	-	150	657	477	-	-
34.2	Pressurizer Relief Tank	25	22	9	8	251	-	83	399	621	-	-
34.3	Reactor Coolant Pumps & Motors	94	78	39	13	1,836	114	548	2,722	4,546	-	-
34.4	Pressurizer	38	48	362	313	905	-	340	2,006	2,318	-	-
34.5	Steam Generators	326	2,839	1,895	793	11,894	2,485	4,527	24,760	22,200	-	-
34.6	CRDMs/ICIs/Service Structure Removal	71	56	90	22	1,061	-	327	1,628	2,627	-	-
34.7	Reactor Vessel Internals	113	1,148	3,892	677	5,588	-	4,854	16,272	1,502	1,096	574
34.8	Reactor Vessel	81	3,124	677	553	8,069	-	6,726	19,230	6,416	2,379	-
34	Totals	849	7,513	6,973	2,387	29,797	2,599	17,556	67,674	40,707	3,474	574
35	Remove spent fuel racks	357	36	17	2	1,034	337	499	2,283	2,560	-	-

DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
-	-	-	-	-	246	86	333
-	-	-	-	-	246	86	333
-	-	-	-	-	3,227	1,129	4,357
1,818	-	-	-	-	-	636	2,454
-	-	-	-	-	629	220	850
-	-	-	-	-	629	220	850
-	-	-	-	-	179	62	241
-	-	-	-	-	33	12	45
-	-	-	-	-	28	10	37
-	-	-	-	-	55	19	75
-	-	-	-	-	221	77	298
-	-	-	-	-	8,553	2,994	11,547
-	-	-	-	-	1,141	399	1,540
-	-	-	-	-	-	-	-
776	-	-	-	-	-	272	1,047
47	-	-	-	-	-	16	63
-	1,474	-	-	-	-	516	1,990
119	-	837	973	3,948	-	2,057	7,934
-	-	-	-	-	4,023	1,408	5,431
-	-	-	-	-	-	-	-
-	341	-	-	-	-	119	461
-	295	-	-	-	-	103	398
-	14	-	-	-	-	5	19
-	-	668	15	608	-	451	1,741
-	-	-	-	-	989	346	1,335
-	-	-	-	-	29	10	39
-	-	-	-	-	456	160	616
-	-	-	-	-	86	30	115
-	-	-	-	-	2,500	875	3,376
-	-	-	-	-	7,157	2,505	9,662
-	-	-	-	-	29,538	10,338	39,876
2,760	2,124	1,503	988	4,556	70,936	29,003	111,870
-	-	-	-	-	-	-	-
113	224	9	9	83	-	153	591
29	25	11	9	108	-	63	245
106	88	43	15	790	129	410	1,580
43	54	409	353	367	-	429	1,655
368	3,205	2,140	895	7,161	2,806	5,801	22,376
81	63	102	25	457	-	255	982
128	1,296	4,394	764	5,884	-	4,363	16,829
92	3,527	765	624	7,298	-	4,307	16,612
959	8,481	7,872	2,694	22,148	2,934	15,781	60,870
403	41	20	3	445	380	452	1,744

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
Removal of Major Equipment												
36	Main Turbine/Generator	-	404	-	-	-	712	208	1,323	-	-	-
37	Main Condensers	-	1,191	-	-	-	827	422	2,440	-	-	-
Disposal of Plant Systems												
38.1	Auxiliary Steam	-	240	-	-	-	361	114	716	-	-	-
38.2	Auxiliary Steam (RCA)	-	238	-	-	-	189	88	515	-	-	-
38.3	Capital Additions 85-2002 (clean)	-	120	-	-	-	-	18	137	-	-	-
38.4	Capital Additions 85-2002 (contaminated)	-	393	3	1	75	154	140	765	185	-	-
38.5	Chemical & Volume Control	950	895	29	13	821	374	965	4,048	2,033	-	-
38.6	Chemical & Volume Control (Insulated)	473	386	8	4	227	31	396	1,524	562	-	-
38.7	Component Cooling Water	-	128	-	-	-	-	19	147	-	-	-
38.8	Component Cooling Water (RCA)	-	539	-	-	-	690	238	1,467	-	-	-
38.9	Compressed Air	-	114	-	-	-	-	17	131	-	-	-
38.10	Compressed Air (Insulated)	-	4	-	-	-	-	1	5	-	-	-
38.11	Compressed Air (RCA Insulated)	-	22	-	-	-	8	7	37	-	-	-
38.12	Compressed Air (RCA)	-	397	-	-	-	157	123	676	-	-	-
38.13	Condensate System	-	1,107	-	-	-	3,824	850	5,780	-	-	-
38.14	Condensate System (Insulated)	-	358	-	-	-	1,179	266	1,803	-	-	-
38.15	Containment Spray	-	198	-	-	-	561	134	893	-	-	-
38.16	Diesel Engine-Generator	-	118	-	-	-	-	18	136	-	-	-
38.17	Diesel Engine-Generator (Insulated)	-	7	-	-	-	-	1	8	-	-	-
38.18	Electrical (Clean)	-	1,407	-	-	-	-	211	1,618	-	-	-
38.19	Electrical (Contaminated)	-	643	2	1	100	398	246	1,390	247	-	-
38.20	Electrical (Contaminated) - FHB	-	193	0	0	9	61	60	323	22	-	-
38.21	Electrical (Decontaminated)	-	3,895	-	-	-	3,955	1,567	9,417	-	-	-
38.22	Electrical (Decontaminated) - FHB	-	1,171	-	-	-	585	380	2,136	-	-	-
38.23	Extraction Steam & Heater Drip	-	475	-	-	-	926	258	1,658	-	-	-
38.24	Feedwater System	-	53	-	-	-	311	60	424	-	-	-
38.25	Feedwater System (Insulated)	-	284	-	-	-	649	168	1,102	-	-	-
38.26	Feedwater System (RCA Insulated)	-	111	-	-	-	156	51	319	-	-	-
38.27	Feedwater System (RCA)	-	5	-	-	-	8	3	16	-	-	-
38.28	Fire Protection	-	260	-	-	-	599	155	1,013	-	-	-
38.29	Fire Protection (RCA)	-	195	-	-	-	128	68	390	-	-	-
38.30	Gaseous Radwaste	-	78	1	1	39	11	31	161	97	-	-
38.31	HVAC (Clean Insulated)	-	19	-	-	-	-	3	21	-	-	-
38.32	HVAC (Clean)	-	235	-	-	-	-	35	270	-	-	-
38.33	HVAC (Contaminated Insulated)	-	293	2	1	43	222	117	677	108	-	-
38.34	HVAC (Contaminated)	-	1,253	9	4	265	1,088	544	3,163	655	-	-
38.35	HVAC (Contaminated) - FHB	-	301	2	1	52	252	126	734	129	-	-
38.36	Liquid Radwaste	665	587	23	10	627	135	660	2,707	1,552	-	-
38.37	Liquid Radwaste (Insulated)	91	72	2	1	49	4	77	296	122	-	-
38.38	Lube Oil Distribution & Purification	-	173	-	-	-	161	67	401	-	-	-
38.39	Make-up Water	-	236	-	-	-	-	35	271	-	-	-
38.40	Make-up Water (Insulated)	-	21	-	-	-	-	3	24	-	-	-
38.41	Make-up Water (RCA Insulated)	-	36	-	-	-	22	12	70	-	-	-
38.42	Make-up Water (RCA)	-	186	-	-	-	124	65	375	-	-	-
38.43	Miscellaneous Reactor Coolant	13	74	1	1	43	23	39	194	106	-	-
38.44	Nitrogen & Hydrogen	-	13	-	-	-	-	2	15	-	-	-
38.45	Nitrogen & Hydrogen (Insulated)	-	1	-	-	-	-	0	1	-	-	-
38.46	Nitrogen & Hydrogen (RCA Insulated)	-	5	-	-	-	2	1	7	-	-	-
38.47	Nitrogen & Hydrogen (RCA)	-	86	-	-	-	30	26	142	-	-	-
38.48	Nuclear Steam Supply Sampling	-	115	2	1	50	24	45	237	124	-	-
38.49	Nuclear Steam Supply Sampling (Insulated	-	35	0	0	12	1	12	60	29	-	-
38.50	Oily Water Separator & TB Sump	-	30	-	-	-	49	15	95	-	-	-
38.51	Residual Heat Removal	254	274	30	14	849	244	449	2,113	2,101	-	-
38.52	Safety Injection	-	94	2	1	44	60	44	244	110	-	-

DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
-	456	-	-	-	803	441	1,700
-	1,344	-	-	-	934	797	3,076
-	271	-	-	-	408	238	916
-	268	-	-	-	214	169	651
-	135	-	-	-	-	47	182
-	443	3	1	32	173	229	882
1,072	1,010	33	15	353	423	1,017	3,923
533	436	9	4	98	35	390	1,505
-	145	-	-	-	-	51	195
-	608	-	-	-	779	486	1,873
-	128	-	-	-	-	45	173
-	5	-	-	-	-	2	6
-	25	-	-	-	9	12	46
-	448	-	-	-	177	219	844
-	1,249	-	-	-	4,316	1,948	7,513
-	404	-	-	-	1,331	607	2,341
-	224	-	-	-	633	300	1,157
-	133	-	-	-	-	47	180
-	8	-	-	-	-	3	11
-	1,588	-	-	-	-	556	2,144
-	726	2	1	43	449	428	1,650
-	218	0	0	4	68	102	393
-	4,397	-	-	-	4,464	3,102	11,963
-	1,322	-	-	-	660	694	2,675
-	536	-	-	-	1,045	553	2,134
-	60	-	-	-	351	144	555
-	320	-	-	-	733	369	1,422
-	125	-	-	-	177	106	408
-	6	-	-	-	9	5	21
-	293	-	-	-	676	339	1,308
-	220	-	-	-	144	127	491
-	88	1	1	17	12	42	160
-	21	-	-	-	-	7	28
-	265	-	-	-	-	93	358
-	330	2	1	19	250	211	812
-	1,415	11	5	114	1,228	970	3,742
-	340	2	1	23	284	227	877
751	663	26	11	270	153	655	2,528
103	82	2	1	21	4	75	288
-	195	-	-	-	182	132	509
-	266	-	-	-	-	93	360
-	24	-	-	-	-	8	32
-	40	-	-	-	25	23	88
-	210	-	-	-	140	123	473
15	83	2	1	18	26	51	195
-	14	-	-	-	-	5	19
-	1	-	-	-	-	0	1
-	5	-	-	-	2	2	9
-	97	-	-	-	34	46	177
-	130	2	1	22	27	64	245
-	40	0	0	5	1	16	63
-	34	-	-	-	56	32	122
287	309	34	15	365	275	450	1,735
-	106	2	1	19	68	68	263

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
38.53	Safety Injection (Insulated)	-	6	0	0	3	2	2	13	7	-	-
38.54	Safety Injection (RCA Insulated)	-	37	1	0	24	18	18	99	60	-	-
38.55	Safety Injection (RCA)	-	309	8	4	218	162	158	858	541	-	-
38.56	Saltwater System	-	127	-	-	-	-	19	146	-	-	-
38.57	Service Cooling Water	-	77	-	-	-	-	12	88	-	-	-
38.58	Service Cooling Water (RCA)	-	24	-	-	-	21	9	54	-	-	-
38.59	Spent Fuel Pit Cooling	-	64	11	5	318	92	111	601	786	-	-
38.60	Spent Fuel Pit Cooling - FHB	-	90	12	6	341	98	124	670	843	-	-
38.61	Turbine Steam Supply	-	1,127	-	-	-	4,522	960	6,609	-	-	-
Disposal of Plant Systems (cont.)												
38.62	Turbine Steam Supply (RCA)	-	778	-	-	-	1,178	371	2,328	-	-	-
38.63	Turbine and Generator	-	101	-	-	-	236	61	398	-	-	-
38.64	Turbine and Generator (Insulated)	-	51	-	-	-	49	20	121	-	-	-
38	Totals	2,446	20,960	147	67	4,209	24,130	10,897	62,857	10,419	-	-
39	Erect scaffolding for systems removal	-	4,239	2	1	50	132	1,092	5,516	124	-	-
Decontamination of Site Buildings												
40.1	Reactor	1,253	1,115	372	180	10,197	427	3,583	17,126	25,241	-	-
40.2	Capital Additions 85-2002	20	14	4	2	113	-	42	195	280	-	-
40.3	Containment Penetration Area	273	41	24	11	651	95	328	1,422	1,611	-	-
40.4	Fuel Handling	613	383	31	15	841	260	657	2,799	2,081	-	-
40	Totals	2,158	1,553	431	208	11,802	781	4,609	21,542	29,213	-	-
41	License Termination Survey	-	-	-	-	-	5,592	1,678	7,270	-	-	-
42	ORISE confirmatory survey	-	-	-	-	-	105	32	137	-	-	-
43	Terminate license	-	-	-	-	-	-	-	note 2	-	-	-
Period 2 Additional Costs												
44	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	34,237	5,136	39,373	-	-	-
45	Spent Fuel Loading Campaigns	-	-	-	-	-	3,927	589	4,516	-	-	-
46	Spent Fuel Ops & Maintenance	-	-	-	-	-	1,636	245	1,881	-	-	-
47	Spent Fuel Fixed Costs	-	-	-	-	-	3,271	491	3,762	-	-	-
48	Spent Fuel Security	-	-	-	-	-	277	42	319	-	-	-
49	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	1,423	213	1,637	-	-	-
Period 2 Additional Costs		5,811	35,895	7,571	2,665	46,892	79,988	43,708	222,530	83,022	3,474	574
0												
1	Decon equipment	687	-	-	-	-	-	103	790	-	-	-
2	Decon supplies	773	-	-	-	-	-	193	966	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	-	-	-
4	Process liquid waste	380	-	277	519	1,666	-	712	3,554	-	4,125	-
5	Insurance	-	-	-	-	-	2,705	270	2,975	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	3,902	-	-	-	-	975	4,877	-	-	-
8	Heavy equipment rental	-	8,874	-	-	-	-	1,331	10,205	-	-	-
9	Small tool allowance	-	604	-	-	-	-	91	694	-	-	-
10	Pipe cutting equipment	-	911	-	-	-	-	137	1,048	-	-	-
11	Decon rig	1,184	-	-	-	-	-	178	1,362	-	-	-
12	Disposal of DAW generated	-	-	1,952	45	4,671	-	1,370	8,037	11,562	-	-
13	Decommissioning Equipment Disposition	-	-	8	4	231	480	131	855	572	-	-
14	Plant energy budget	-	-	-	-	-	5,493	824	6,317	-	-	-
15	NRC ISFSI Fees	-	-	-	-	-	1,710	171	1,881	-	-	-
16	NRC Fees	-	-	-	-	-	3,466	347	3,813	-	-	-
17	Emergency Planning Fees	-	-	-	-	-	791	79	871	-	-	-
18	Site Security Cost	-	-	-	-	-	13,918	2,088	16,005	-	-	-
19	LLRW Processing Equipment	-	-	-	-	-	1,516	227	1,743	-	-	-

DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
-	6	0	0	1	2	4	14
-	42	1	0	10	20	26	100
-	349	9	4	94	182	224	862
-	143	-	-	-	-	50	193
-	87	-	-	-	-	30	117
-	27	-	-	-	23	18	68
-	72	13	6	137	104	116	447
-	101	13	6	147	111	132	511
-	1,273	-	-	-	5,104	2,232	8,609
-	-	-	-	-	-	-	-
-	878	-	-	-	1,330	773	2,981
-	114	-	-	-	267	133	514
-	58	-	-	-	56	40	153
2,761	23,661	166	76	1,811	27,240	19,500	75,216
-	4,786	2	1	22	149	1,736	6,695
1,414	1,258	420	203	4,388	482	2,858	11,023
23	15	5	2	49	-	33	126
308	46	27	13	280	107	273	1,054
692	433	35	17	362	294	641	2,472
2,437	1,753	487	234	5,078	882	3,805	14,675
-	-	-	-	-	6,313	2,210	8,522
-	-	-	-	-	119	42	161
-	-	-	-	-	-	-	-
-	-	-	-	-	38,650	13,527	52,177
-	-	-	-	-	4,433	1,552	5,985
-	-	-	-	-	1,846	646	2,493
-	-	-	-	-	3,693	1,293	4,985
-	-	-	-	-	313	109	422
-	-	-	-	-	1,607	562	2,169
776	-	-	-	-	-	272	1,047
872	-	-	-	-	-	305	1,178
-	1,474	-	-	-	-	516	1,990
428	-	313	586	1,881	-	1,123	4,331
-	-	-	-	-	3,053	1,069	4,122
-	-	-	-	-	-	-	-
-	4,405	-	-	-	-	1,542	5,946
-	10,017	-	-	-	-	3,506	13,523
-	682	-	-	-	-	239	920
-	1,028	-	-	-	-	360	1,388
1,337	-	-	-	-	-	468	1,804
-	-	2,203	51	2,010	-	1,492	5,757
-	-	10	5	99	542	229	885
-	-	-	-	-	6,201	2,170	8,371
-	-	-	-	-	1,930	676	2,606
-	-	-	-	-	3,913	1,369	5,282
-	-	-	-	-	893	313	1,206
-	-	-	-	-	15,711	5,499	21,210
-	-	-	-	-	1,711	599	2,310

TABLE C-1
DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
Subtotal Undistributed Costs Period 2		3,024	15,596	2,237	568	6,568	30,078	9,422	67,494	12,134	4,125	-
Staff Costs												
	DOC Staff Cost	-	-	-	-	-	28,658	4,299	32,957	-	-	-
	Utility Staff Cost	-	-	-	-	-	103,830	15,574	119,404	-	-	-
TOTAL PERIOD 2		8,835	51,491	9,808	3,233	53,461	242,555	73,004	442,386	95,156	7,599	574
PERIOD 3												
Demolition of Remaining Site Buildings												
50.1	Reactor	-	6,871	-	-	-	-	1,031	7,902	-	-	-
50.2	Capital Additions 85-2002	-	105	-	-	-	-	16	121	-	-	-
50.3	Containment Penetration Area	-	421	-	-	-	-	63	485	-	-	-
50.4	Fuel Handling	-	1,313	-	-	-	-	197	1,510	-	-	-
50.5	Miscellaneous	-	20	-	-	-	-	3	23	-	-	-
50.6	Turbine	-	2,510	-	-	-	-	377	2,887	-	-	-
50.7	Turbine Pedestal	-	935	-	-	-	-	140	1,075	-	-	-
50	Totals	-	12,176	-	-	-	-	1,826	14,002	-	-	-
Site Closeout Activities												
51	Grade & landscape site	-	1,386	-	-	-	-	208	1,594	-	-	-
52	Final report to NRC	-	-	-	-	-	125	19	143	-	-	-
Period 3 Additional Cost												
53	Vessel & Internals GTCC Disposal	-	-	-	-	13,213	-	1,982	15,195	-	-	-
54	Spent Fuel Ops & Maintenance	-	-	-	-	-	296	44	341	-	-	-
55	Spent Fuel Fixed Costs	-	-	-	-	-	593	89	681	-	-	-
56	Spent Fuel Security	-	-	-	-	-	593	89	681	-	-	-
57	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	512	77	588	-	-	-
Subtotal Period 3 Activity Costs		-	13,562	-	-	13,213	2,118	4,334	33,227	-	-	-
1	Insurance	-	-	-	-	-	172	17	189	-	-	-
2	Property taxes	-	-	-	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	3,779	-	-	-	-	567	4,346	-	-	-
4	Small tool allowance	-	154	-	-	-	-	23	177	-	-	-
5	Plant energy budget	-	-	-	-	-	103	15	119	-	-	-
6	NRC ISFSI Fees	-	-	-	-	-	310	31	341	-	-	-
7	Site Security Cost	-	-	-	-	-	622	93	716	-	-	-
Subtotal Undistributed Costs Period 3		-	3,933	-	-	-	1,207	747	5,887	-	-	-
Staff Costs												
	DOC Staff Cost	-	-	-	-	-	4,682	702	5,384	-	-	-
	Utility Staff Cost	-	-	-	-	-	2,200	330	2,530	-	-	-
TOTAL PERIOD 3		-	17,495	-	-	13,213	10,207	6,113	47,028	-	-	-
TOTAL COST TO DECOMMISSION		11,279	70,868	11,140	4,108	71,583	315,599	91,266	575,844	98,652	16,255	574

DIABLO CANYON POWER PLANT UNIT 1
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
Subtotal Undistributed Costs Period 2		3,413	17,606	2,525	641	3,991	33,955	21,746	83,877
Staff Costs									
	DOC Staff Cost	-	-	-	-	-	32,351	11,323	43,674
	Utility Staff Cost	-	-	-	-	-	117,211	41,024	158,234
TOTAL PERIOD 2		9,973	58,127	11,072	3,650	33,495	273,813	136,545	526,675
PERIOD 3									
Demolition of Remaining Site Buildings									
50.1	Reactor	-	7,757	-	-	-	-	2,715	10,472
50.2	Capital Additions 85-2002	-	119	-	-	-	-	42	161
50.3	Containment Penetration Area	-	476	-	-	-	-	167	642
50.4	Fuel Handling	-	1,482	-	-	-	-	519	2,001
50.5	Miscellaneous	-	22	-	-	-	-	8	30
50.6	Turbine	-	2,834	-	-	-	-	992	3,825
50.7	Turbine Pedestal	-	1,055	-	-	-	-	369	1,425
50	Totals	-	13,745	-	-	-	-	4,811	18,556
Site Closeout Activities									
51	Grade & landscape site	-	1,565	-	-	-	-	548	2,113
52	Final report to NRC	-	-	-	-	-	141	49	190
Period 3 Additional Cost									
53	Vessel & Internals GTCC Disposal	-	-	-	-	14,915	-	5,220	20,136
54	Spent Fuel Ops & Maintenance	-	-	-	-	-	334	117	452
55	Spent Fuel Fixed Costs	-	-	-	-	-	669	234	903
56	Spent Fuel Security	-	-	-	-	-	669	234	903
57	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	578	202	780
Subtotal Period 3 Activity Costs		-	15,310	-	-	14,915	2,391	11,416	44,032
1	Insurance	-	-	-	-	-	194	68	262
2	Property taxes	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	4,266	-	-	-	-	1,493	5,759
4	Small tool allowance	-	174	-	-	-	-	61	235
5	Plant energy budget	-	-	-	-	-	116	41	157
6	NRC ISFSI Fees	-	-	-	-	-	350	122	472
7	Site Security Cost	-	-	-	-	-	702	246	948
Subtotal Undistributed Costs Period 3		-	4,440	-	-	-	1,362	2,031	7,833
Staff Costs									
	DOC Staff Cost	-	-	-	-	-	5,285	1,850	7,135
	Utility Staff Cost	-	-	-	-	-	2,484	869	3,353
TOTAL PERIOD 3		-	19,750	-	-	14,915	11,522	16,166	62,353
TOTAL COST TO DECOMMISSION		12,733	80,001	12,575	4,638	52,966	356,271	181,714	700,898

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
PERIOD 1												
1	Prepare preliminary decommissioning cost	-	-	-	-	-	104	16	120	-	-	-
2	Notification of Cessation of Operations	-	-	-	-	-	-	-	Note 1	-	-	-
3	Remove fuel & source material	-	-	-	-	-	-	-	Note 2	-	-	-
4	Notification of Permanent Defueling	-	-	-	-	-	-	-	Note 1	-	-	-
5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	Note 1	-	-	-
6	Prepare and submit PSDAR	-	-	-	-	-	160	24	184	-	-	-
7	Review plant dwgs & specs.	-	-	-	-	-	368	55	423	-	-	-
8	Perform detailed rad survey	-	-	-	-	-	-	-	Note 1	-	-	-
9	Estimate by-product inventory	-	-	-	-	-	80	12	92	-	-	-
10	End product description	-	-	-	-	-	80	12	92	-	-	-
11	Detailed by-product inventory	-	-	-	-	-	104	16	120	-	-	-
12	Define major work sequence	-	-	-	-	-	600	90	690	-	-	-
13	Perform SER and EA	-	-	-	-	-	248	37	285	-	-	-
14	Perform Site-Specific Cost Study	-	-	-	-	-	400	60	460	-	-	-
15	Prepare/submit License Termination Plan	-	-	-	-	-	328	49	377	-	-	-
16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	Note 1	-	-	-
Activity Specifications												
17.1	Plant & temporary facilities	-	-	-	-	-	394	59	453	-	-	-
17.2	Plant systems	-	-	-	-	-	333	50	383	-	-	-
17.3	NSSS Decontamination Flush	-	-	-	-	-	40	6	46	-	-	-
17.4	Reactor internals	-	-	-	-	-	568	85	653	-	-	-
17.5	Reactor vessel	-	-	-	-	-	520	78	598	-	-	-
17.6	Biological shield	-	-	-	-	-	40	6	46	-	-	-
17.7	Steam generators	-	-	-	-	-	250	37	287	-	-	-
17.8	Reinforced concrete	-	-	-	-	-	128	19	147	-	-	-
17.9	Turbine & condenser	-	-	-	-	-	64	10	74	-	-	-
17.10	Plant structures & buildings	-	-	-	-	-	250	37	287	-	-	-
17.11	Waste management	-	-	-	-	-	368	55	423	-	-	-
17.12	Facility & site closeout	-	-	-	-	-	72	11	83	-	-	-
17	Total	-	-	-	-	-	3,025	454	3,479	-	-	-
Planning & Site Preparations												
18	Prepare dismantling sequence	-	-	-	-	-	192	29	221	-	-	-
19	Plant prep. & temp. svces	-	-	-	-	-	2,304	346	2,650	-	-	-
20	Design water clean-up system	-	-	-	-	-	112	17	129	-	-	-
21	Rigging/CCEs/tooling/etc.	-	-	-	-	-	1,950	293	2,243	-	-	-
22	Procure casks/liners & containers	-	-	-	-	-	98	15	113	-	-	-
Detailed Work Procedures												
23.1	Plant systems	-	-	-	-	-	379	57	435	-	-	-
23.2	NSSS Decontamination Flush	-	-	-	-	-	80	12	92	-	-	-
23.3	Vessel head	-	-	-	-	-	200	30	230	-	-	-
23.4	Reactor internals	-	-	-	-	-	200	30	230	-	-	-
23.5	Remaining buildings	-	-	-	-	-	108	16	124	-	-	-
23.6	CRD cooling assembly	-	-	-	-	-	80	12	92	-	-	-
23.7	CRD housings & ICI tubes	-	-	-	-	-	80	12	92	-	-	-
23.8	Incore instrumentation	-	-	-	-	-	80	12	92	-	-	-
23.9	Reactor vessel	-	-	-	-	-	290	44	334	-	-	-
23.10	Facility closeout	-	-	-	-	-	96	14	110	-	-	-
23.11	Missile shields	-	-	-	-	-	36	5	41	-	-	-
23.12	Biological shield	-	-	-	-	-	96	14	110	-	-	-
23.13	Steam generators	-	-	-	-	-	368	55	423	-	-	-
23.14	Reinforced concrete	-	-	-	-	-	80	12	92	-	-	-
23.15	Turbine & condensers	-	-	-	-	-	250	37	287	-	-	-

Detailed Work Procedures (cont.)

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
PERIOD 1									
1	Prepare preliminary decommissioning cost	-	-	-	-	-	117	41	158
2	Notification of Cessation of Operations	-	-	-	-	-	-	-	-
3	Remove fuel & source material	-	-	-	-	-	-	-	-
4	Notification of Permanent Defueling	-	-	-	-	-	-	-	-
5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-
6	Prepare and submit PSDAR	-	-	-	-	-	181	63	244
7	Review plant dwgs & specs.	-	-	-	-	-	415	145	561
8	Perform detailed rad survey	-	-	-	-	-	-	-	-
9	Estimate by-product inventory	-	-	-	-	-	90	32	122
10	End product description	-	-	-	-	-	90	32	122
11	Detailed by-product inventory	-	-	-	-	-	117	41	158
12	Define major work sequence	-	-	-	-	-	677	237	914
13	Perform SER and EA	-	-	-	-	-	280	98	378
14	Perform Site-Specific Cost Study	-	-	-	-	-	451	158	609
15	Prepare/submit License Termination Plan	-	-	-	-	-	370	129	499
16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-
Activity Specifications									
17.1	Plant & temporary facilities	-	-	-	-	-	444	155	600
17.2	Plant systems	-	-	-	-	-	376	132	508
17.3	NSSS Decontamination Flush	-	-	-	-	-	45	16	61
17.4	Reactor internals	-	-	-	-	-	641	224	865
17.5	Reactor vessel	-	-	-	-	-	587	205	792
17.6	Biological shield	-	-	-	-	-	45	16	61
17.7	Steam generators	-	-	-	-	-	282	99	380
17.8	Reinforced concrete	-	-	-	-	-	144	51	195
17.9	Turbine & condenser	-	-	-	-	-	72	25	98
17.10	Plant structures & buildings	-	-	-	-	-	282	99	380
17.11	Waste management	-	-	-	-	-	415	145	561
17.12	Facility & site closeout	-	-	-	-	-	81	28	110
17	Total	-	-	-	-	-	3,415	1,195	4,611
Planning & Site Preparations									
18	Prepare dismantling sequence	-	-	-	-	-	217	76	293
19	Plant prep. & temp. svces	-	-	-	-	-	2,601	910	3,511
20	Design water clean-up system	-	-	-	-	-	126	44	171
21	Rigging/CCEs/tooling/etc.	-	-	-	-	-	2,201	771	2,972
22	Procure casks/liners & containers	-	-	-	-	-	111	39	150
Detailed Work Procedures									
23.1	Plant systems	-	-	-	-	-	427	150	577
23.2	NSSS Decontamination Flush	-	-	-	-	-	90	32	122
23.3	Vessel head	-	-	-	-	-	226	79	305
23.4	Reactor internals	-	-	-	-	-	226	79	305
23.5	Remaining buildings	-	-	-	-	-	122	43	165
23.6	CRD cooling assembly	-	-	-	-	-	90	32	122
23.7	CRD housings & ICI tubes	-	-	-	-	-	90	32	122
23.8	Incore instrumentation	-	-	-	-	-	90	32	122
23.9	Reactor vessel	-	-	-	-	-	328	115	442
23.10	Facility closeout	-	-	-	-	-	108	38	146
23.11	Missile shields	-	-	-	-	-	41	14	55
23.12	Biological shield	-	-	-	-	-	108	38	146
23.13	Steam generators	-	-	-	-	-	415	145	561
23.14	Reinforced concrete	-	-	-	-	-	90	32	122
23.15	Turbine & condensers	-	-	-	-	-	282	99	380

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
23.16	Auxiliary building	-	-	-	-	-	218	33	251	-	-	-
23.17	Reactor building	-	-	-	-	-	218	33	251	-	-	-
23	Total	-	-	-	-	-	2,859	429	3,288	-	-	-
24	Decon primary loop	1,492	-	-	-	-	-	746	2,238	-	-	-
Period 1 Additional Costs												
25	Hazardous Waste Management	-	-	-	-	-	557	84	641	-	-	-
26	Mixed Waste Management	-	-	-	-	-	557	84	641	-	-	-
27	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	700	105	805	-	-	-
28	Spent Fuel Loading Campaigns	-	-	-	-	-	130	20	150	-	-	-
29	Spent Fuel Ops & Maintenance	-	-	-	-	-	415	62	478	-	-	-
30	Spent Fuel Fixed Costs	-	-	-	-	-	831	125	956	-	-	-
31	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	196	29	225	-	-	-
32	Spent Fuel Pool Isolation	-	-	-	-	-	5,051	758	5,809	-	-	-
33	Site Characterization	-	-	-	-	-	1,011	303	1,314	-	-	-
Subtotal Period 1 Activity Costs		1,492	-	-	-	-	22,461	4,267	28,219	-	-	-
Period 1 Undistributed Costs												
1	Decon equipment	687	-	-	-	-	-	103	790	-	-	-
2	Decon supplies	41	-	-	-	-	-	10	52	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	-	-	-
4	Process liquid waste	103	-	688	800	3,225	-	1,046	5,861	-	7,982	-
5	Insurance	-	-	-	-	-	3,564	356	3,920	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	302	-	-	-	-	76	378	-	-	-
8	Heavy equipment rental	-	261	-	-	-	-	39	300	-	-	-
9	Small tool allowance	-	12	-	-	-	-	2	14	-	-	-
10	Disposal of DAW generated	-	-	606	14	1,441	-	423	2,484	3,567	-	-
11	Plant energy budget	-	-	-	-	-	876	131	1,008	-	-	-
12	NRC ISFSI Fees	-	-	-	-	-	434	43	478	-	-	-
13	NRC Fees	-	-	-	-	-	245	25	270	-	-	-
14	Emergency Planning Fees	-	-	-	-	-	76	8	83	-	-	-
15	Site Security Cost	-	-	-	-	-	1,578	237	1,815	-	-	-
Subtotal Undistributed Costs Period 1		831	1,882	1,294	814	4,666	6,774	2,695	18,956	3,567	7,982	-
Staff Costs												
	DOC Staff Cost	-	-	-	-	-	4,077	611	4,688	-	-	-
	Utility Staff Cost	-	-	-	-	-	26,173	3,926	30,099	-	-	-
TOTAL PERIOD 1 COST		2,323	1,882	1,294	814	4,666	59,484	11,499	81,962	3,567	7,982	-
PERIOD 2												
Nuclear Steam Supply System Removal												
34.1	Reactor Coolant Piping	100	198	8	8	193	-	150	657	477	-	-
34.2	Pressurizer Relief Tank	25	22	9	8	251	-	83	399	621	-	-
34.3	Reactor Coolant Pumps & Motors	94	78	39	13	1,836	114	548	2,722	4,546	-	-
34.4	Pressurizer	38	48	362	313	905	-	340	2,006	2,318	-	-
34.5	Steam Generators	326	2,839	1,895	793	11,894	2,485	4,527	24,760	22,200	-	-
34.6	CRDMs/ICIs/Service Structure Removal	71	56	91	22	1,061	-	327	1,629	2,627	-	-
34.7	Reactor Vessel Internals	106	1,123	3,867	644	5,487	-	4,766	15,992	1,502	845	574
34.8	Reactor Vessel	79	3,118	674	553	8,069	-	6,720	19,213	6,416	2,379	-
34	Totals	839	7,482	6,946	2,354	29,696	2,599	17,462	67,378	40,707	3,224	574
35	Remove spent fuel racks	357	36	18	2	1,034	337	498	2,282	2,558	-	-

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
23.16	Auxiliary building	-	-	-	-	-	246	86	333
23.17	Reactor building	-	-	-	-	-	246	86	333
23	Total	-	-	-	-	-	3,227	1,129	4,357
24	Decon primary loop	1,684	-	-	-	-	-	589	2,273
Period 1 Additional Costs									
25	Hazardous Waste Management	-	-	-	-	-	629	220	850
26	Mixed Waste Management	-	-	-	-	-	629	220	850
27	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	790	277	1,067
28	Spent Fuel Loading Campaigns	-	-	-	-	-	147	52	199
29	Spent Fuel Ops & Maintenance	-	-	-	-	-	469	164	633
30	Spent Fuel Fixed Costs	-	-	-	-	-	938	328	1,266
31	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	221	77	298
32	Spent Fuel Pool Isolation	-	-	-	-	-	5,702	1,996	7,698
33	Site Characterization	-	-	-	-	-	1,141	399	1,540
Subtotal Period 1 Activity Costs		1,684	-	-	-	-	25,355	9,464	36,503
Period 1 Undistributed Costs									
1	Decon equipment	776	-	-	-	-	-	272	1,047
2	Decon supplies	47	-	-	-	-	-	16	63
3	DOC staff relocation expenses	-	1,474	-	-	-	-	516	1,990
4	Process liquid waste	116	-	776	903	3,640	-	1,902	7,338
5	Insurance	-	-	-	-	-	4,023	1,408	5,431
6	Property taxes	-	-	-	-	-	-	-	-
7	Health physics supplies	-	341	-	-	-	-	119	461
8	Heavy equipment rental	-	295	-	-	-	-	103	398
9	Small tool allowance	-	14	-	-	-	-	5	19
10	Disposal of DAW generated	-	-	685	16	620	-	462	1,782
11	Plant energy budget	-	-	-	-	-	989	346	1,335
12	NRC ISFSI Fees	-	-	-	-	-	490	172	662
13	NRC Fees	-	-	-	-	-	277	97	374
14	Emergency Planning Fees	-	-	-	-	-	86	30	115
15	Site Security Cost	-	-	-	-	-	1,782	624	2,405
Subtotal Undistributed Costs Period 1		938	2,124	1,461	919	4,260	7,647	6,072	23,421
Staff Costs									
	DOC Staff Cost	-	-	-	-	-	4,602	1,611	6,213
	Utility Staff Cost	-	-	-	-	-	29,546	10,341	39,887
TOTAL PERIOD 1 COST		2,623	2,124	1,461	919	4,260	67,150	27,488	106,024
PERIOD 2									
Nuclear Steam Supply System Removal									
34.1	Reactor Coolant Piping	113	224	9	9	83	-	153	591
34.2	Pressurizer Relief Tank	29	25	11	9	108	-	63	245
34.3	Reactor Coolant Pumps & Motors	106	88	43	15	790	129	410	1,580
34.4	Pressurizer	43	54	409	353	367	-	429	1,655
34.5	Steam Generators	368	3,205	2,140	895	7,161	2,806	5,801	22,376
34.6	CRDMs/ICIs/Service Structure Removal	81	63	103	25	457	-	255	983
34.7	Reactor Vessel Internals	119	1,267	4,365	727	5,770	-	4,287	16,535
34.8	Reactor Vessel	89	3,520	761	624	7,299	-	4,303	16,596
34	Totals	947	8,446	7,841	2,657	22,035	2,934	15,701	60,561
35	Remove spent fuel racks	403	41	20	3	445	380	452	1,743

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
Removal of Major Equipment												
36	Main Turbine/Generator	-	410	-	-	-	723	211	1,344	-	-	-
37	Main Condensers	-	1,191	-	-	-	827	422	2,440	-	-	-
Disposal of Plant Systems												
38.1	Auxiliary Steam	-	122	-	-	-	198	60	380	-	-	-
38.2	Auxiliary Steam (RCA)	-	117	-	-	-	93	43	253	-	-	-
38.3	Building Services (Non-Power Block)	-	5	-	-	-	-	1	5	-	-	-
38.4	Capital Additions 85-2002 (Clean)	-	638	-	-	-	-	96	733	-	-	-
38.5	Capital Additions 85-2002 (contaminated)	-	448	3	1	85	226	168	931	210	-	-
38.6	Chemical & Volume Control	877	777	26	12	712	317	863	3,584	1,763	-	-
38.7	Chemical & Volume Control (Insulated)	427	354	7	3	207	30	360	1,388	512	-	-
38.8	Component Cooling Water	-	124	-	-	-	-	19	143	-	-	-
38.9	Component Cooling Water (RCA)	-	528	-	-	-	691	236	1,455	-	-	-
38.10	Compressed Air	-	77	-	-	-	-	11	88	-	-	-
38.11	Compressed Air (Insulated)	-	4	-	-	-	-	1	5	-	-	-
38.12	Compressed Air (RCA Insulated)	-	22	-	-	-	9	7	37	-	-	-
38.13	Compressed Air (RCA)	-	387	-	-	-	167	122	676	-	-	-
38.14	Condensate System	-	1,011	-	-	-	3,525	781	5,317	-	-	-
38.15	Condensate System (Insulated)	-	345	-	-	-	1,166	261	1,772	-	-	-
38.16	Containment Spray	-	187	-	-	-	541	128	856	-	-	-
38.17	Diesel Engine-Generator	-	74	-	-	-	-	11	85	-	-	-
38.18	Diesel Engine-Generator (Insulated)	-	2	-	-	-	-	0	2	-	-	-
38.19	Electrical (Clean)	-	2,058	-	-	-	-	309	2,366	-	-	-
38.20	Electrical (Contaminated)	-	371	1	1	45	191	133	741	111	-	-
38.21	Electrical (Contaminated) - FHB	-	115	0	0	5	36	35	192	13	-	-
38.22	Electrical (RCA)	-	2,222	-	-	-	1,656	804	4,682	-	-	-
38.23	Electrical (RCA)-FHB	-	691	-	-	-	342	224	1,257	-	-	-
38.24	Extraction Steam & Heater Drip	-	402	-	-	-	887	234	1,522	-	-	-
38.25	Feedwater System	-	75	-	-	-	723	127	925	-	-	-
38.26	Feedwater System (Insulated)	-	106	-	-	-	-	16	122	-	-	-
38.27	Feedwater System (RCA Insulated)	-	107	-	-	-	155	50	311	-	-	-
38.28	Feedwater System (RCA)	-	5	-	-	-	8	2	16	-	-	-
38.29	Fire Protection	-	245	-	-	-	590	150	986	-	-	-
38.30	Fire Protection (RCA)	-	203	-	-	-	175	77	454	-	-	-
38.31	Gaseous Radwaste	-	106	2	1	49	48	46	252	121	-	-
38.32	HVAC (Clean Insulated)	-	26	-	-	-	-	4	30	-	-	-
38.33	HVAC (Clean)	-	274	-	-	-	-	41	315	-	-	-
38.34	HVAC (Contaminated Insulated)	-	220	1	0	25	155	84	485	61	-	-
38.35	HVAC (Contaminated)	-	942	7	3	181	763	396	2,292	448	-	-
38.36	HVAC (Contaminated) - FHB	-	213	1	0	25	167	85	491	62	-	-
38.37	Liquid Radwaste	355	317	15	6	392	112	374	1,570	970	-	-
38.38	Liquid Radwaste (Insulated)	40	35	1	0	25	2	35	138	61	-	-
38.39	Lube Oil Distribution & Purification	-	188	-	-	-	269	87	545	-	-	-
38.40	Make-up Water	-	161	-	-	-	-	24	185	-	-	-
38.41	Make-up Water (Insulated)	-	15	-	-	-	-	2	18	-	-	-
38.42	Make-up Water (RCA Insulated)	-	25	-	-	-	19	9	54	-	-	-
38.43	Make-up Water (RCA)	-	125	-	-	-	109	48	282	-	-	-
38.44	Mechanical Department Equipment	-	1	-	-	-	-	0	1	-	-	-
38.45	Miscellaneous Reactor Coolant	13	76	1	1	43	23	40	197	106	-	-
38.46	NSSS Sampling	-	95	2	1	62	7	41	208	154	-	-
38.47	NSSS Sampling (Insulated)	-	27	0	0	8	-	9	44	19	-	-
38.48	Nitrogen & Hydrogen	-	13	-	-	-	-	2	14	-	-	-
38.49	Nitrogen & Hydrogen (Insulated)	-	1	-	-	-	-	0	1	-	-	-
38.50	Nitrogen & Hydrogen (RCA Insulated)	-	4	-	-	-	1	1	7	-	-	-
Disposal of Plant Systems (cont.)												
38.51	Nitrogen & Hydrogen (RCA)	-	79	-	-	-	27	24	129	-	-	-
38.52	Nuclear Steam Supply Sampling	-	19	0	0	10	2	7	38	24	-	-
38.53	Nuclear Steam Supply Sampling (Insulated	-	8	0	0	4	1	3	16	10	-	-

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
-	463	-	-	-	816	448	1,726
-	1,344	-	-	-	934	797	3,076
-	137	-	-	-	224	126	487
-	132	-	-	-	105	83	320
-	5	-	-	-	-	2	7
-	720	-	-	-	-	252	972
-	506	3	2	37	255	281	1,083
990	877	29	13	306	358	901	3,475
482	400	8	4	89	34	356	1,373
-	140	-	-	-	-	49	190
-	596	-	-	-	780	482	1,858
-	86	-	-	-	-	30	117
-	5	-	-	-	-	2	6
-	24	-	-	-	10	12	46
-	437	-	-	-	188	219	844
-	1,141	-	-	-	3,979	1,792	6,912
-	389	-	-	-	1,317	597	2,303
-	211	-	-	-	611	288	1,110
-	84	-	-	-	-	29	113
-	2	-	-	-	-	1	3
-	2,323	-	-	-	-	813	3,136
-	419	1	1	19	216	229	885
-	130	0	0	2	40	60	233
-	2,509	-	-	-	1,869	1,532	5,910
-	780	-	-	-	386	408	1,574
-	454	-	-	-	1,001	509	1,964
-	85	-	-	-	817	315	1,217
-	120	-	-	-	-	42	161
-	120	-	-	-	175	103	399
-	6	-	-	-	9	5	20
-	277	-	-	-	666	330	1,274
-	229	-	-	-	197	149	575
-	120	2	1	21	54	69	267
-	29	-	-	-	-	10	40
-	309	-	-	-	-	108	418
-	248	1	0	11	175	152	588
-	1,063	7	3	78	862	705	2,718
-	241	1	0	11	188	154	596
401	358	17	7	169	126	377	1,454
45	39	1	0	11	2	34	133
-	212	-	-	-	304	181	697
-	181	-	-	-	-	63	245
-	17	-	-	-	-	6	23
-	28	-	-	-	22	18	68
-	141	-	-	-	123	93	357
-	1	-	-	-	-	0	1
15	86	2	1	18	26	52	199
-	107	2	1	27	7	51	196
-	31	0	0	3	-	12	47
-	14	-	-	-	-	5	19
-	1	-	-	-	-	0	1
-	5	-	-	-	2	2	8
-	-	-	-	-	-	-	-
-	89	-	-	-	30	42	161
-	21	0	0	4	2	10	38
-	9	0	0	2	1	4	16

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DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
38.54	Oily Water Separator & TB Sump	-	20	-	-	-	33	10	62	-	-	-
38.55	Residual Heat Removal	248	256	30	14	841	240	439	2,067	2,081	-	-
38.56	Safety Injection	-	92	2	1	44	60	43	241	109	-	-
38.57	Safety Injection (Insulated)	-	5	0	0	3	2	2	12	7	-	-
38.58	Safety Injection (RCA Insulated)	-	36	1	0	24	18	18	97	60	-	-
38.59	Safety Injection (RCA)	-	294	8	4	217	160	153	835	537	-	-
38.60	Saltwater System	-	120	-	-	-	-	18	138	-	-	-
38.61	Service Cooling Water	-	90	-	-	-	-	14	104	-	-	-
38.62	Service Cooling Water (RCA)	-	30	-	-	-	28	12	70	-	-	-
38.63	Sewer System Expansion	-	31	-	-	-	-	5	36	-	-	-
38.64	Spent Fuel Pit Cooling	-	65	11	5	319	94	112	606	790	-	-
38.65	Spent Fuel Pit Cooling - FHB	-	90	12	6	342	101	125	677	848	-	-
38.66	Turbine Steam Supply	-	1,157	-	-	-	4,610	981	6,748	-	-	-
38.67	Turbine Steam Supply (RCA)	-	803	-	-	-	1,234	386	2,422	-	-	-
38.68	Turbine and Generator	-	102	-	-	-	250	63	416	-	-	-
38.69	Turbine and Generator (Insulated)	-	46	-	-	-	46	18	111	-	-	-
38	Totals	1,960	18,026	130	59	3,666	20,308	9,089	53,239	9,074	-	-
39	Erect scaffolding for systems removal	-	7,950	4	1	111	292	2,060	10,419	276	-	-
Decontamination of Site Buildings												
40.1	Reactor	1,253	1,116	375	180	10,197	427	3,583	17,131	25,241	-	-
40.2	Auxiliary	1,111	103	96	46	2,630	183	1,283	5,451	6,510	-	-
40.3	Capital Additions 85-2002	326	14	24	11	672	-	339	1,385	1,662	-	-
40.4	Containment Penetration Area	273	41	24	11	651	95	328	1,422	1,611	-	-
40.5	Fuel Handling	613	383	31	15	841	260	657	2,800	2,081	-	-
40.6	Radwaste Storage	38	6	10	5	286	6	94	445	707	-	-
40	Totals	3,614	1,663	561	268	15,276	970	6,283	28,635	37,812	-	-
41	License Termination Survey	-	-	-	-	-	9,074	2,722	11,796	-	-	-
42	ORISE confirmatory survey	-	-	-	-	-	105	32	137	-	-	-
43	Terminate license	-	-	-	-	-	-	-	note 2	-	-	-
Period 2 Additional Costs												
44	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	33,696	5,054	38,750	-	-	-
45	Spent Fuel Loading Campaigns	-	-	-	-	-	3,826	574	4,400	-	-	-
46	Spent Fuel Ops & Maintenance	-	-	-	-	-	1,333	200	1,533	-	-	-
47	Spent Fuel Fixed Costs	-	-	-	-	-	2,666	400	3,066	-	-	-
48	Spent Fuel Security	-	-	-	-	-	454	68	522	-	-	-
49	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	1,582	237	1,819	-	-	-
Subtotal Period 2 Activity Costs		6,770	36,757	7,659	2,684	49,783	78,793	45,313	227,759	90,427	3,224	574
Period 2 Undistributed Costs												
1	Decon equipment	687	-	-	-	-	-	103	790	-	-	-
2	Decon supplies	1,247	-	-	-	-	-	312	1,559	-	-	-
3	DOC staff relocation expenses	-	1,306	-	-	-	-	196	1,502	-	-	-
4	Process liquid waste	399	-	269	522	1,643	-	715	3,548	-	4,067	-
5	Insurance	-	-	-	-	-	2,084	208	2,293	-	-	-
6	Property taxes	-	-	-	-	-	-	-	-	-	-	-
7	Health physics supplies	-	4,092	-	-	-	-	1,023	5,114	-	-	-
8	Heavy equipment rental	-	8,027	-	-	-	-	1,204	9,231	-	-	-
9	Small tool allowance	-	594	-	-	-	-	89	683	-	-	-
10	Pipe cutting equipment	-	911	-	-	-	-	137	1,048	-	-	-
Period 2 Undistributed Costs (cont.)												
11	Decon rig	1,184	-	-	-	-	-	178	1,362	-	-	-
12	Disposal of DAW generated	-	-	1,814	42	4,311	-	1,265	7,432	10,671	-	-
13	Decommissioning Equipment Disposition	-	-	8	4	231	480	131	855	572	-	-
14	Plant energy budget	-	-	-	-	-	4,969	745	5,714	-	-	-

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
38.54	Oily Water Separator & TB Sump	-	22	-	-	-	37	21	80
38.55	Residual Heat Removal	280	289	34	15	362	271	438	1,688
38.56	Safety Injection	-	103	2	1	19	67	67	260
38.57	Safety Injection (Insulated)	-	6	0	0	1	2	3	12
38.58	Safety Injection (RCA Insulated)	-	40	1	0	10	20	25	98
38.59	Safety Injection (RCA)	-	331	9	4	93	181	216	835
38.60	Saltwater System	-	136	-	-	-	-	47	183
38.61	Service Cooling Water	-	102	-	-	-	-	36	137
38.62	Service Cooling Water (RCA)	-	34	-	-	-	31	23	88
38.63	Sewer System Expansion	-	35	-	-	-	-	12	48
38.64	Spent Fuel Pit Cooling	-	73	13	6	137	106	117	453
38.65	Spent Fuel Pit Cooling - FHB	-	102	14	6	147	114	134	518
38.66	Turbine Steam Supply	-	1,306	-	-	-	5,204	2,279	8,789
38.67	Turbine Steam Supply (RCA)	-	906	-	-	-	1,393	805	3,104
38.68	Turbine and Generator	-	115	-	-	-	283	139	537
38.69	Turbine and Generator (Insulated)	-	52	-	-	-	52	36	141
38	Totals	2,213	20,349	147	67	1,578	22,925	16,547	63,825
39	Erect scaffolding for systems removal	-	8,974	5	2	48	330	3,275	12,634
Decontamination of Site Buildings									
40.1	Reactor	1,415	1,260	423	203	4,388	482	2,859	11,029
40.2	Auxiliary	1,254	116	109	52	1,132	206	1,004	3,873
40.3	Capital Additions 85-2002	368	16	27	12	289	-	249	962
40.4	Containment Penetration Area	308	46	27	13	280	107	273	1,055
40.5	Fuel Handling	692	433	35	17	362	294	641	2,473
40.6	Radwaste Storage	43	6	12	6	123	7	69	265
40	Totals	4,080	1,877	633	302	6,573	1,095	5,096	19,657
41	License Termination Survey	-	-	-	-	-	10,243	3,585	13,829
42	ORISE confirmatory survey	-	-	-	-	-	119	42	161
43	Terminate license	-	-	-	-	-	-	-	-
Period 2 Additional Costs									
44	Spent Fuel Pad, Cask, Canister, Equipment	-	-	-	-	-	38,038	13,313	51,351
45	Spent Fuel Loading Campaigns	-	-	-	-	-	4,319	1,512	5,831
46	Spent Fuel Ops & Maintenance	-	-	-	-	-	1,505	527	2,032
47	Spent Fuel Fixed Costs	-	-	-	-	-	3,010	1,053	4,063
48	Spent Fuel Security	-	-	-	-	-	512	179	691
49	Transfer of Spent Fuel Canisters to DOE	-	-	-	-	-	1,786	625	2,411
Subtotal Period 2 Activity Costs		7,643	41,494	8,646	3,030	30,679	88,947	63,153	243,591
Period 2 Undistributed Costs									
1	Decon equipment	776	-	-	-	-	-	272	1,047
2	Decon supplies	1,408	-	-	-	-	-	493	1,900
3	DOC staff relocation expenses	-	1,474	-	-	-	-	516	1,990
4	Process liquid waste	450	-	304	589	1,855	-	1,119	4,317
5	Insurance	-	-	-	-	-	2,353	823	3,176
6	Property taxes	-	-	-	-	-	-	-	-
7	Health physics supplies	-	4,619	-	-	-	-	1,617	6,235
8	Heavy equipment rental	-	9,061	-	-	-	-	3,172	12,233
9	Small tool allowance	-	670	-	-	-	-	235	905
10	Pipe cutting equipment	-	1,028	-	-	-	-	360	1,388
Period 2 Undistributed Costs (cont.)									
11	Decon rig	1,337	-	-	-	-	-	468	1,804
12	Disposal of DAW generated	-	-	2,048	47	1,855	-	1,382	5,332
13	Decommissioning Equipment Disposition	-	-	10	5	99	542	229	885
14	Plant energy budget	-	-	-	-	-	5,609	1,963	7,572

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
15	NRC ISFSI Fees	-	-	-	-	-	1,394	139	1,533	-	-	-
16	NRC Fees	-	-	-	-	-	2,672	267	2,939	-	-	-
17	Emergency Planning Fees	-	-	-	-	-	610	61	671	-	-	-
18	Site Security Cost	-	-	-	-	-	19,050	2,858	21,908	-	-	-
19	LLRW Processing Equipment	-	-	-	-	-	1,346	202	1,547	-	-	-
Subtotal Undistributed Costs Period 2		3,517	14,929	2,092	568	6,185	32,604	9,833	69,728	11,243	4,067	-
Staff Costs												
	DOC Staff Cost	-	-	-	-	-	29,080	4,362	33,442	-	-	-
	Utility Staff Cost	-	-	-	-	-	108,415	16,262	124,677	-	-	-
TOTAL PERIOD 2		**10,287**	**51,686**	**9,750**	**3,252**	**55,968**	**248,892**	**75,771**	**455,606**	**101,669**	**7,291**	**574**
PERIOD 3												
Demolition of Remaining Site Buildings												
50.1	Reactor	-	6,887	-	-	-	-	1,033	7,921	-	-	-
50.2	Administration	-	793	-	-	-	-	119	912	-	-	-
50.3	Auxiliary	-	5,449	-	-	-	-	817	6,266	-	-	-
50.4	Breakwater	-	35,437	-	-	-	-	5,316	40,752	-	-	-
50.5	Capital Additions 85-2002	-	3,410	-	-	-	-	512	3,922	-	-	-
50.6	Chemical Storage	-	3	-	-	-	-	1	4	-	-	-
50.7	Chlorination	-	7	-	-	-	-	1	8	-	-	-
50.8	Circulating Water Tunnels	-	1,035	-	-	-	-	155	1,190	-	-	-
50.9	Cold Machine Shop	-	290	-	-	-	-	43	333	-	-	-
50.10	Communication	-	3	-	-	-	-	0	4	-	-	-
50.11	Condensate Polishing/Technical Support	-	386	-	-	-	-	58	444	-	-	-
50.12	Containment Penetration Area	-	423	-	-	-	-	63	486	-	-	-
50.13	Discharge Structure	-	756	-	-	-	-	113	869	-	-	-
50.14	Fabrication Shop	-	92	-	-	-	-	14	106	-	-	-
50.15	Fire Pump House	-	4	-	-	-	-	1	5	-	-	-
50.16	Fuel Handling	-	1,276	-	-	-	-	191	1,468	-	-	-
50.17	Hazardous Waste Storage Facility	-	1,360	-	-	-	-	204	1,564	-	-	-
50.18	Intake Structure	-	4,296	-	-	-	-	644	4,940	-	-	-
50.19	Maintenance Shop	-	266	-	-	-	-	40	306	-	-	-
50.20	Miscellaneous Structures	-	51	-	-	-	-	8	58	-	-	-
50.21	NPO Permanent Warehouse	-	1,057	-	-	-	-	159	1,216	-	-	-
50.22	Ponds	-	1	-	-	-	-	0	1	-	-	-
50.23	Portable Fire Pump & Fuel Cart	-	1	-	-	-	-	0	1	-	-	-
50.24	Pretreatment	-	8	-	-	-	-	1	9	-	-	-
50.25	Radwaste Storage	-	1,403	-	-	-	-	210	1,613	-	-	-
50.26	Rotor Warhouse	-	717	-	-	-	-	107	824	-	-	-
50.27	Security	-	286	-	-	-	-	43	329	-	-	-
50.28	Simulator	-	316	-	-	-	-	47	364	-	-	-
50.29	Telephone Terminal	-	2	-	-	-	-	0	2	-	-	-
50.30	Turbine	-	3,466	-	-	-	-	520	3,986	-	-	-
50.31	Turbine Pedestal	-	938	-	-	-	-	141	1,079	-	-	-
50.32	Vehicle Maintenance	-	27	-	-	-	-	4	31	-	-	-
50.33	Waste Water Holding & Treatment Facility	-	18	-	-	-	-	3	20	-	-	-
50	Totals	-	70,464	-	-	-	-	10,570	81,034	-	-	-
Site Closeout Activities												
51	Remove Rubble	-	108,505	-	-	-	-	16,276	124,781	-	-	-
52	Grade & landscape site	-	1,395	-	-	-	-	209	1,605	-	-	-
53	Final report to NRC	-	-	-	-	-	125	19	143	-	-	-
Period 3 Additional Cost												
54	Vessel & Internals GTCC Disposal	-	-	-	-	13,213	-	1,982	15,195	-	-	-

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
15	NRC ISFSI Fees	-	-	-	-	-	1,573	551	2,124
16	NRC Fees	-	-	-	-	-	3,016	1,056	4,072
17	Emergency Planning Fees	-	-	-	-	-	689	241	930
18	Site Security Cost	-	-	-	-	-	21,505	7,527	29,032
19	LLRW Processing Equipment	-	-	-	-	-	1,519	532	2,051
Subtotal Undistributed Costs Period 2		3,970	16,853	2,361	641	3,809	36,805	22,554	86,994
Staff Costs									
	DOC Staff Cost	-	-	-	-	-	32,828	11,490	44,318
	Utility Staff Cost	-	-	-	-	-	122,386	42,835	165,222
TOTAL PERIOD 2		11,613	58,347	11,007	3,671	34,488	280,967	140,032	540,124
PERIOD 3									
Demolition of Remaining Site Buildings									
50.1	Reactor	-	7,775	-	-	-	-	2,721	10,496
50.2	Administration	-	895	-	-	-	-	313	1,209
50.3	Auxiliary	-	6,151	-	-	-	-	2,153	8,304
50.4	Breakwater	-	40,003	-	-	-	-	14,001	54,005
50.5	Capital Additions 85-2002	-	3,849	-	-	-	-	1,347	5,197
50.6	Chemical Storage	-	4	-	-	-	-	1	5
50.7	Chlorination	-	8	-	-	-	-	3	11
50.8	Circulating Water Tunnels	-	1,168	-	-	-	-	409	1,577
50.9	Cold Machine Shop	-	327	-	-	-	-	115	442
50.10	Communication	-	4	-	-	-	-	1	5
50.11	Condensate Polishing/Technical Support	-	435	-	-	-	-	152	588
50.12	Containment Penetration Area	-	477	-	-	-	-	167	644
50.13	Discharge Structure	-	853	-	-	-	-	299	1,152
50.14	Fabrication Shop	-	104	-	-	-	-	36	140
50.15	Fire Pump House	-	5	-	-	-	-	2	6
50.16	Fuel Handling	-	1,441	-	-	-	-	504	1,945
50.17	Hazardous Waste Storage Facility	-	1,535	-	-	-	-	537	2,073
50.18	Intake Structure	-	4,850	-	-	-	-	1,697	6,547
50.19	Maintenance Shop	-	301	-	-	-	-	105	406
50.20	Miscellaneous Structures	-	57	-	-	-	-	20	78
50.21	NPO Permanent Warehouse	-	1,194	-	-	-	-	418	1,612
50.22	Ponds	-	1	-	-	-	-	0	1
50.23	Portable Fire Pump & Fuel Cart	-	1	-	-	-	-	0	2
50.24	Pretreatment	-	9	-	-	-	-	3	12
50.25	Radwaste Storage	-	1,584	-	-	-	-	554	2,138
50.26	Rotor Warhouse	-	809	-	-	-	-	283	1,092
50.27	Security	-	323	-	-	-	-	113	436
50.28	Simulator	-	357	-	-	-	-	125	482
50.29	Telephone Terminal	-	2	-	-	-	-	1	3
50.30	Turbine	-	3,913	-	-	-	-	1,369	5,282
50.31	Turbine Pedestal	-	1,059	-	-	-	-	371	1,430
50.32	Vehicle Maintenance	-	31	-	-	-	-	11	41
50.33	Waste Water Holding & Treatment Facility	-	20	-	-	-	-	7	27
50	Totals	-	79,545	-	-	-	-	27,841	107,385
Site Closeout Activities									
51	Remove Rubble	-	122,488	-	-	-	-	42,871	165,359
52	Grade & landscape site	-	1,575	-	-	-	-	551	2,126
53	Final report to NRC	-	-	-	-	-	141	49	190
Period 3 Additional Cost									
54	Vessel & Internals GTCC Disposal	-	-	-	-	14,915	-	5,220	20,136

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2002 Dollars)

BEST PRINTED ON LEDGER SIZE PAPER

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total	Burial site A CF	Burial site B CF	Burial site C CF
55	ISFSI License Termination	26	2,179	54	17	1,063	1,152	1,004	5,496	2,632	-	-
56	ISFSI Demolition	-	1,557	-	-	-	34	239	1,830	-	-	-
57	Spent Fuel Ops & Maintenance	-	-	-	-	-	208	31	239	-	-	-
58	Spent Fuel Fixed Cost	-	-	-	-	-	416	62	478	-	-	-
59	Spent Fuel Security	-	-	-	-	-	416	62	478	-	-	-
60	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	353	53	406	-	-	-
Subtotal Period 3 Activity Costs		26	184,100	54	17	14,276	2,703	30,507	231,684	2,632	-	-
Period 3 Undistributed Costs												
1	Insurance	-	-	-	-	-	218	22	240	-	-	-
2	Property taxes	-	-	-	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	3,779	-	-	-	-	567	4,346	-	-	-
4	Small tool allowance	-	691	-	-	-	-	104	795	-	-	-
5	Plant energy budget	-	-	-	-	-	103	15	119	-	-	-
6	NRC ISFSI Fees	-	-	-	-	-	217	22	239	-	-	-
7	Emergency Planning Fees	-	-	-	-	-	212	21	234	-	-	-
8	Site Security Cost	-	-	-	-	-	2,572	386	2,958	-	-	-
Subtotal Undistributed Costs Period 3		-	4,471	-	-	-	3,323	1,137	8,930	-	-	-
Staff Costs												
	DOC Staff Cost	-	-	-	-	-	9,994	1,499	11,493	-	-	-
	Utility Staff Cost	-	-	-	-	-	10,128	1,519	11,647	-	-	-
TOTAL PERIOD 3		26	188,571	54	17	14,276	26,148	34,662	263,754	2,632	-	-
TOTAL COST TO DECOMMISSION		12,637	242,138	11,099	4,082	74,910	334,524	121,932	801,322	107,868	15,272	574

TABLE C-2
DIABLO CANYON POWER PLANT UNIT 2
DECON DECOMMISSIONING COST ESTIMATE
(Thousands of 2005 Dollars)

(Escalated @ 12.887% from 2002; Revised Contingency to 35%; Revised Class A Burial Rate from $450/cf to $200/cf.)

ID Number	Activity Description	Decon	Remove	Pack	Ship	Burial	Other	Contingency	Total
55	ISFSI License Termination	30	2,459	61	19	457	1,300	1,515	5,842
56	ISFSI Demolition	-	1,758	-	-	-	39	629	2,425
57	Spent Fuel Ops & Maintenance	-	-	-	-	-	235	82	317
58	Spent Fuel Fixed Cost	-	-	-	-	-	470	164	634
59	Spent Fuel Security	-	-	-	-	-	470	164	634
60	Transfer Spent Fuel Canisters to DOE	-	-	-	-	-	398	139	537
Subtotal Period 3 Activity Costs		30	207,825	61	19	15,373	3,052	79,226	305,586
Period 3 Undistributed Costs									
1	Insurance	-	-	-	-	-	246	86	332
2	Property taxes	-	-	-	-	-	-	-	-
3	Heavy equipment rental	-	4,266	-	-	-	-	1,493	5,759
4	Small tool allowance	-	781	-	-	-	-	273	1,054
5	Plant energy budget	-	-	-	-	-	116	41	157
6	NRC ISFSI Fees	-	-	-	-	-	245	86	331
7	Emergency Planning Fees	-	-	-	-	-	240	84	324
8	Site Security Cost	-	-	-	-	-	2,903	1,016	3,920
Subtotal Undistributed Costs Period 3		-	5,047	-	-	-	3,751	3,079	11,877
Staff Costs									
	DOC Staff Cost	-	-	-	-	-	11,282	3,949	15,230
	Utility Staff Cost	-	-	-	-	-	11,433	4,002	15,435
TOTAL PERIOD 3		30	212,872	61	19	15,373	29,517	90,255	348,128
TOTAL COST TO DECOMMISSION		14,265	273,342	12,529	4,609	54,121	377,634	257,775	994,275