



**Maureen R. Zawalick**  
Vice President  
Decommissioning and  
Technical Services

Diablo Canyon Power Plant  
Mail code 104/6/608  
P.O. Box 56  
Avila Beach, CA 93424

805.545.4242  
Maureen.Zawalick@pge.com

PG&E Letter DCL-22-041

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

10 CFR 50.82(a)(4)  
10 CFR 50.82(a)(8)

Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 and 2  
Diablo Canyon Power Plant, Units 1 and 2 – Site-Specific Decommissioning Cost Estimate, Revision 1

Reference:

1. PG&E Letter DCL-19-082, “Diablo Canyon Power Plant, Units 1 and 2 – Site-Specific Decommissioning Cost Estimate,” dated December 4, 2019 (ML19345D344 and ML19345D345)

Dear Commissioners and Staff:

In Reference 1, Pacific Gas and Electric Company (PG&E) submitted the site-specific decommissioning cost estimate (SSDCE) for Diablo Canyon Power Plant (DCPP), Units 1 and 2, pursuant to the requirements of 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(iii). Reference 1 also satisfied the requirements of 10 CFR 50.75(f)(3) for a preliminary decommissioning cost estimate. The purpose of this submittal is to provide the NRC Revision 1 of the SSDCE for DCPP, Units 1 and 2, which has been updated to reflect PG&E's plans for decommissioning as submitted to the California Public Utilities Commission (CPUC) in the 2021 Nuclear Decommissioning Cost Triennial Proceeding. Revision bars in the margin indicate sections where information has been updated.

Enclosure 1 contains SSDCE, Revision 1 for DCPP Unit 1 and Unit 2. A DCPP decommissioning cost estimate (DCE) was prepared by PG&E and submitted to the CPUC in 2021. Using this DCE, PG&E updated the SSDCE submitted in Reference 1. Enclosure 1 contains confidential information that should be withheld from public disclosure in accordance with 10 CFR 2.390. As required by 10 CFR 50.82(a)(7), PG&E will notify the NRC in writing, with copies sent to the State of California, before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the

Enclosure 1 contains Confidential information—Withhold Under 10 CFR 2.390  
When separated from Enclosure 1, this document is decontrolled

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Post-Shutdown Decommissioning Activities Report (PSDAR), including changes that significantly increase the decommissioning cost.

Enclosure 2 contains the redacted version of SSDCE, Revision 1 for DCP Unit 1 and Unit 2.

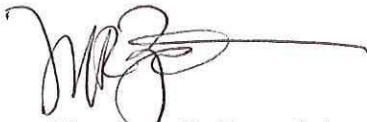
Enclosure 3 contains a Financial Information Affidavit pursuant to 10 CFR 2.390. The Affidavit sets forth the basis for which specific information included in Enclosure 1 may be withheld from public disclosure by the Commission and addresses the considerations listed in 10 CFR 2.390(b)(4). All documents within the scope of this affidavit are marked as "Confidential Information – Withhold Under 10 CFR 2.390."

An updated Irradiated Fuel Management Plan and PSDAR are being submitted concurrently with SSDCE, Revision 1 under separate cover letters. The technical, schedule, and cost information provided is consistent among these submittals.

PG&E makes no new or revised regulatory commitments (as defined by NEI 99-04) in this letter.

Should you have any questions, please contact Mr. Philippe Soenen at (805) 459-3701.

Sincerely,



Maureen R. Zawalick

*Vice President Decommissioning and Technical Services*

10/12/2022

Date

Enclosures

cc: Diablo Distribution  
cc/enc: Mahdi O. Hayes, NRC Senior Resident Inspector  
Scott A. Morris, NRC Region IV Administrator  
Samson S. Lee, NRR Senior Project Manager  
Gonzalo L. Perez, California Department of Health Services (without Enclosure 1)

**Site-Specific Decommissioning Cost Estimate**  
**Revision 1**  
**Diablo Canyon Power Plant**  
**Unit 1 and Unit 2**  
**(Redacted Version)**

# SITE-SPECIFIC DECOMMISSIONING COST ESTIMATE

## Revision 1

DIABLO CANYON POWER PLANT  
Unit 1 and Unit 2

August 2022  
Pacific Gas and Electric



**Diablo Canyon Power Plant  
Site-Specific Decommissioning Cost Estimate, Revision 1**

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**Diablo Canyon Power Plant  
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**Acronyms**

A&G	Administrative and General
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
CSLC	California State Lands Commission
D&D	decontaminate and dismantle
DC	Diablo Canyon
DCE	decommissioning cost estimate
DCPP	Diablo Canyon Power Plant
DOE	Department of Energy
GTCC	greater than Class C
FTE	Full-Time Equivalent
HBPP	Humboldt Bay Power Plant
HSA	historical site assessment
ISFSI	independent spent fuel storage installation
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
NDT	Nuclear Decommissioning Trust
NRC	Nuclear Regulatory Commission
PG&E	Pacific Gas and Electric Company
PMP	project management plan
PSDAR	Post-Shutdown Decommissioning Activities Report
SFP	spent fuel pool
SNF	spent nuclear fuel
SSC	systems, structures, and components
SSDCE	Site-Specific Decommissioning Cost Estimate

# **Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1**

## **Executive Summary**

In December 2019, Pacific Gas and Electric Company (PG&E) submitted the site-specific decommissioning cost estimate (SSDCE) to the Nuclear Regulatory Commission (NRC) (Reference 13). This initial SSDCE was based on the decommissioning cost estimate (DCE) submitted to the California Public Utilities Commission (CPUC) in 2018. Revision 1 of the SSDCE has been updated to reflect the revised decommissioning plans in the updated DCE submitted to the CPUC in 2021 (Reference 12). This report constitutes the updated SSDCE for Diablo Canyon Power Plant (DCPP), Units 1 and 2, in accordance with the requirements of 10 CFR 50.82, "Termination of license." paragraphs (a)(4)(i), and (a)(8)(iii).

The decommissioning approach that has been selected by PG&E for DCPP is the DECON method. While some decommissioning activities would begin after Unit 1 shutdown, most decommissioning activities at the two units would begin soon after the Unit 2 shutdown and are sequenced and integrated to minimize the total cost and duration of the physical dismantling processes.

PG&E used a dedicated team of nuclear, decommissioning, and DCPP experts to form a decommissioning plan, schedule, and associated cost estimate instead of relying on a generic nuclear industry decommissioning unit cost factor methodology. The DCE is informed using cost-based and historical bid-based estimating, direct experience gained by PG&E after 10 years of full-scale decommissioning at Humboldt Bay Power Plant (HBPP) Unit 3, industry expertise, and benchmarking. The planning team includes experts in specific fields who understand the complexity and multi-discipline requirements for a project of this scale.

The cost to decommission the site, safeguard the spent fuel until it can be transferred to the Department of Energy (DOE) for storage at a permanent offsite repository, and restore the impacted area of the site is estimated to be approximately \$4.08 billion in 2022 dollars. The summary of the costs estimated for License Termination, Spent Fuel Management, and Site Restoration activities are presented in Table ES-1.

PG&E currently has more funds in the decommissioning trust fund for DCPP Units 1 and 2 than required to meet the minimum NRC decommissioning amount of \$706.8 million (2022 dollars) for each unit that was calculated pursuant to the requirements of 10 CFR 50.75(c).



**Diablo Canyon Power Plant  
Site-Specific Decommissioning Cost Estimate, Revision 1**

**Table ES-1: Diablo Canyon Power Plant Decommissioning Cost Estimate Summary (in thousands of 2022 dollars)**

ID <sup>1</sup>	Scope Description	A	I	J	K
		Total Estimate	License Termination	Spent Fuel Management	Site Restoration
Unassigned Costs					
1	Decommissioning Program Oversight	362,704	286,336	37,126	39,242
2	Site Costs	1,432,030	879,994	518,889	33,146
3	Administration & General	283,937	214,352	68,081	1,503
Discrete Costs					
4	Decommissioning Preparations	38,509	38,509		
5	Site Infrastructure	128,500	128,500		
6	Large Component Removal	167,563	167,563		
7	Reactor/Internals Segmentation	403,982	403,982		
8	SNF & GTCC Transfer to Onsite Storage	264,756		264,756	
9	Turbine Building	100,980	62,767		38,213
10	Auxiliary Building	200,148	85,952		114,196
11	Containment Building	315,913	98,408		217,505
12	Fuel Handling Building	42,605	42,605		
14	Balance of Site	90,193	26,207		63,986
15	Intake Structure	11,685	11,685		
16	Discharge Structure	18,768	5,681		13,087
18	Non-ISFSI Site Restoration	154,039			154,039
20	SNF & GTCC Storage Demolition & Restoration	62,216		62,216	
	GRAND TOTAL	4,078,527	2,452,541	951,069	674,917

<sup>1</sup> Note: Costs associated with IDs 13, 17, and 19 were moved under other IDs and therefore are not shown in this table.

# Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1

## 1. Introduction and Summary

### 1.1. Introduction

In December 2019, PG&E submitted the SSDCE to the NRC (Reference 13). This initial SSDCE was based on the DCE submitted to the CPUC in 2018. Revision 1 of the SSDCE has been updated to reflect the revised decommissioning plans in the updated DCE submitted to the CPUC in 2021. This report constitutes the updated SSDCE for DCP, Units 1 and 2, in accordance with the requirements of 10 CFR 50.82, "Termination of license." paragraphs (a)(4)(i), and (a)(8)(iii). This updated SSDCE contains the following:

- a description of the overall decommissioning project (Section 3),
- a summary DCE by major activity and phase (Section 4),
- a description of the decommissioning cost estimating methodology (Section 4),
- a discussion of site-specific factors, such as staffing levels, radioactive waste volume estimates, and site characterization (Section 4.2), and
- a schedule of the major decommissioning activities (Section 5).

The DCP Decommissioning Funding Report submitted to the NRC in 2022 (Reference 1) also provided the minimum decommissioning fund estimate, and concludes PG&E currently has more funds in the decommissioning trust fund for DCP Units 1 and 2 than required to meet the minimum NRC decommissioning amount of \$706.8 million (2022 dollars) for each unit that was calculated pursuant to the requirements of 10 CFR 50.75(c).

An updated Irradiated Fuel Management Plan (IFMP) and Post-Shutdown Decommissioning Activities Report (PSDAR) are being submitted concurrently with the updated SSDCE. The technical, schedule, and cost information provided is consistent among these submittals.

### 1.2. Site Description

The two-unit DCP consists of a pair of Westinghouse four loop pressurized water reactors. At full capacity, Unit 1 and Unit 2 each has a thermal rating of 3,411 megawatt-thermal, with corresponding gross electrical outputs of 1,190 megawatt-electrical (Reference 12, Section 1.2). The current facility operating licenses for DCP expire on November 2, 2024, for Unit 1 and August 26, 2025, for Unit 2.

The DCP site is adjacent to the Pacific Ocean in San Luis Obispo County, California, and is approximately 12 miles west-southwest of the city of San Luis Obispo. The residential community of Los Osos is approximately 8 miles north of the site. This community is in a coastal hillside area adjacent to Montaña de Oro State Park. The township of Avila Beach is located down the coast at approximately 7 miles southeast of the site. The city of Morro Bay is located up the coast

## **Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1**

approximately 11 miles northwest of the site. The plant is roughly equidistant between San Francisco and Los Angeles.

The principal structures of DCPD include two containment structures, turbine building, auxiliary building, radwaste buildings, administration building, training building, maintenance building, storage tanks, intake and discharge structures, and transmission switchyards. An independent spent fuel storage installation (ISFSI) is also located at DCPD that has capacity for all spent nuclear fuel (SNF) generated through the end of the operating licenses. The Diablo Canyon (DC) ISFSI is licensed under a 10 CFR 72 site-specific license.

By letter dated November 27, 2018 (Reference 2), PG&E provided formal notification to the NRC that it intends to permanently cease power operations of DCPD on November 2, 2024, for Unit 1 and August 26, 2025, for Unit 2. Once each DCPD unit has permanently ceased operation and fuel has been permanently removed from the reactor vessel, PG&E will submit written certifications to the NRC, in accordance with 10 CFR 50.82(a)(1)(ii) and 10 CFR 50.4(b)(8) and (9). Upon docketing of the certifications required by 10 CFR 50.82(a)(1)(i) and 10 CFR 50.82(a)(1)(ii), pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 licenses for DCPD will no longer authorize operation of the reactors or emplacement or retention of fuel in the reactor vessels.

### **1.3. Regulatory Guidance**

Current regulations governing decommissioning, waste management, and spent fuel management; and the funding of those elements, include the following:

- Decommissioning is defined, in part, in 10 CFR 50.2 as the safe removal of a facility or site from service and the reduction of residual radioactivity to levels that permit release of the site and termination of the license.
- Pursuant to 10 CFR 50.51(b), each license for a facility that has permanently ceased operations continues in effect beyond the expiration date to authorize ownership and possession of the production or utilization facility, until the NRC notifies the licensee in writing that the license is terminated.
- Pursuant to 10 CFR 50.75(f)(3), at or about five years prior to cessation of operations, the licensee shall submit a preliminary DCE.
- Prior to, or within two years following permanent cessation of operations, the licensee is required by 10 CFR 50.82(a)(4)(i) to submit a PSDAR to the NRC. The PSDAR must contain a SSDCE, including the projected cost of managing irradiated fuel.
- Pursuant to 10 CFR 50.82(a)(7) the licensee is required to notify the NRC before performing any decommissioning activity inconsistent with, or making any significant changes from, those actions and schedules described in the PSDAR, including changes that significantly increase decommissioning costs.
- Pursuant to 10 CFR 50.82(a)(8)(iii), within 2 years following permanent cessation of operations, if not already submitted, the licensee shall submit a SSDCE.

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Site-Specific Decommissioning Cost Estimate, Revision 1**

- In accordance with 10 CFR 72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate for the plan. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor related greater than Class C (GTCC) waste have been removed.
- Use of the decommissioning funds is limited by 10 CFR 50.82(a)(8)(i) to legitimate decommissioning expenses that neither reduces the value of the trust fund below that necessary to place and maintain the reactor in a safe storage condition if unforeseen conditions or expenses arise, nor inhibits the ability of the licensee to complete funding of any shortfalls in the trust needed to ensure the availability of funds to ultimately release the site and terminate the license.
- As provided in 10 CFR 50.82(a)(8)(ii), a licensee may withdraw funds from the decommissioning trust up to a cumulative total of three percent of the generic amount calculated under 10 CFR 50.75 for decommissioning planning purposes at any time.
- After submittal of the certifications of permanent cessation of operations and fuel removal required under 10 CFR 50.82(a)(1) and commencing 90 days after the NRC has received the PSDAR, the licensee may use an additional 20 percent of the decommissioning funds prescribed in 10 CFR 50.75(c) for decommissioning purposes. The licensee is prohibited from using the remaining 77 percent of the generic decommissioning funds until a SSDCE is submitted to the NRC.
- Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Plants," (Reference 3) and NUREG-1713, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors," (Reference 4) provides the standard format and content to facilitate preparation and NRC review of required cost estimates.

## **2. Decommissioning Alternatives**

The NRC has evaluated the environmental impacts of three general strategies for decommissioning power reactor facilities in NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors" (Reference 5). The three general methods evaluated are summarized as follows:

- DECON: The systems, structures, and components (SSCs) that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the 10 CFR 50 license shortly after cessation of operations.
- SAFSTOR: After the plant is shut down and defueled, the facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to

## **Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1**

levels that permit 10 CFR 50 license termination. During SAFSTOR, a facility is left intact, or may be partially dismantled, but the SNF is removed from the reactor vessel, and radioactive liquids are drained from systems and components and then processed. Radioactive decay occurs during the SAFSTOR period, thereby reducing the quantity of contamination and radioactivity that must be disposed of during decontamination and dismantlement.

- ENTOMB: Radioactive SSCs are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained, and continued surveillance is carried out until the radioactivity decays to a level that permits termination of the 10 CFR 50 license.

The decommissioning approach that has been selected by PG&E for DCPD is the DECON method. While some decommissioning activities would begin after the Unit 1 shutdown, most decommissioning activities at the two units would begin soon after Unit 2 shutdown and are sequenced and integrated to minimize the total cost and duration of the physical dismantling processes. (Reference 12, Section 1.5). DCPD decommissioning includes: permanent removal of fuel from the reactors; transfer SNF to the DC ISFSI; decontaminate and dismantle (D&D) SSCs to levels that permit license termination; and restore non-DC ISFSI site areas. In accordance with 10 CFR 50.82(a)(9), a license termination plan will be developed and submitted for NRC approval at least two years prior to termination of the licenses (Reference 12, Section 1.4.1). 10 CFR 50 license termination is targeted for approximately 10 years after Unit 2 shutdown. After SNF and GTCC waste are transferred to the DOE for storage at a permanent offsite repository, the DC ISFSI will be decommissioned in accordance with 10 CFR 72, and the site restored (including biological monitoring), within an additional 9 years.

PG&E has a site-specific license for the DC ISFSI. The CPUC required PG&E to conduct an assessment for expediting SNF offload to the DC ISFSI. The results of this study demonstrated that there are currently alternate dry casks storage systems available (as compared to those currently approved for use in the DC ISFSI site-specific license) that may reduce the cooling time required in the spent fuel pools (SFPs) prior to transfer to the DC ISFSI. Thus, in 2020, PG&E conducted a request-for-proposal process to select an alternate dry cask storage system. In 2022, PG&E executed a contract with Orano TN Americas (Orano) for SNF and GTCC waste dry cask storage systems. In the 2022-2024 timeframe, PG&E and Orano will perform the work necessary to prepare for implementing the new dry cask storage systems, including any regulatory actions and preparation for physical modifications to the site (to be implemented in Phase 2) to store SNF at the DC ISFSI and GTCC waste at a new GTCC Waste Storage Facility. PG&E plans to employ the NUHOMS-EOS system to store SNF at DCPD under Certificate of Compliance 1042, which will be amended via NRC licensing action with Orano in the 2022-2024 timeframe. The cost and schedule impacts associated with this recently executed contract will be incorporated into a future revision of the SSDCE.

## Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1

The decision to transition to immediate DECON is consistent with the CPUC and stakeholder preference and is also in the best interest of PG&E's customers because the total cost of decommissioning can be reduced by direct transition to decommissioning immediately upon plant shutdown. PG&E determined that immediate transition to decommissioning is more cost-effective than the SAFSTOR strategy based on the following considerations: (1) the operating licenses are terminated earlier; (2) earlier security staff and emergency plan reductions due to security modifications and earlier transfer of SNF to the DC ISFSI; (3) benchmarking experience of other plants supports more efficient resolution of technical challenges; and (4) availability of experienced, in-house staff (Reference 12, Section 1.5).

Typically, initial planning efforts detailing the decommissioning process can take 18 to 24 months after reactor shutdown before physical decommissioning begins. To support a direct transition to immediate DECON, PG&E plans to leverage the CPUC's early approval of DCPD shutdown in 2024 and 2025 to continue decommissioning planning and permitting activities from 2019 to 2024. The planning would streamline the decommissioning effort, reduce decommissioning costs, and accelerate the schedule by allowing the majority of physical decommissioning of portions of the site to begin shortly after the Unit 2 permanent shut down. This also would shorten the overall decommissioning schedule. Industry experience indicates that early, detailed preparation and planning reduces the duration and cost of decommissioning while enhancing safety and efficiency (References 6 and 7) (Reference 12, Section 1.5).

### 3. Decommissioning Overview

DCPD expects to conduct decommissioning of DCPD in the following phases presented in Table 3-1.

**Table 3-1: Diablo Canyon Power Plant Decommissioning Phases Summary**

Phase	Phase Title	Phase Start	Phase Finish	General Description
1	Pre-Shutdown Planning	Nov. 2010	Oct. 2024	Consists of detailed planning, engineering, contracting, licensing, and permitting efforts.
2	Zirc Fire	Nov. 2024	Feb. 2027	Transitions the plant to a decommissioning configuration to support safe and efficient decommissioning. Designates the timeframe where SNF is cooling in the SFPs and/or is being transferred to the DC ISFSI.
3	Wet Storage	Mar. 2027	Nov. 2028	Designates the timeframe where SNF continues to cool in the SFPs and/or is being transferred to the DC ISFSI. Concurrently, preparations are continuing for major D&D in the next phase.
4	Building Demolition	Dec. 2028	Dec. 2032	Consists of D&D of radiological SSCs. Also includes removal of several ancillary (non-radiological) structures.



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Phase	Phase Title	Phase Start	Phase Finish	General Description
5	Non-ISFSI Site Restoration	Jan 2033	Apr. 2035	Includes demolition of non-radiological structures, conduct of final radiological surveys to support license termination, and restoration of non-ISFSI areas. Period ends with 10 CFR 50 license termination.
6	ISFSI Operations	May 2035	Aug. 2067	Designates the timeframe after 10 CFR 50 license termination where SNF and GTCC waste are stored only at the DC ISFSI and GTCC Waste Storage Facility, respectively, and transferred to the DOE for storage at a permanent offsite repository. This period also includes biological monitoring of the plant site restoration.
7	SNF and GTCC Storage Demolition and Restoration	Sep. 2067	Jan. 2076	Consists of removal of ISFSI and GTCC Waste Storage Facility structures, conduct of final radiological surveys for ISFSI license termination, restoration of affected areas, and biological monitoring.

#### 4. Decommissioning Cost Estimate Methodology

The DCE (Reference 12) is divided into three NRC-defined cost categories (or phases) -- License Termination, Spent Fuel Management, and Site Restoration. Within each category, costs were estimated by scope of work (Reference 12, Table 1-2).

**License Termination:** Costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR 50.75). The cost reported for this category is generally sufficient to terminate the plant’s operating licenses, recognizing that spent fuel management represents an additional cost liability that will interact with the license termination effort.

**Spent Fuel Management:** Costs associated with the containerization and transfer of spent fuel from the SFPs to the DC ISFSI and the transfer of casks from the DC ISFSI to an approved off-site location. Costs also are included for the operations of the SFPs, management of the DC ISFSI and GTCC Waste Storage Facility until all SNF and GTCC waste is transferred to an approved off-site location, demolition of the DC ISFSI and GTCC Waste Storage Facility, and restoration of the associated area.

**Site Restoration:** Costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from radiological contamination. This includes structures never exposed to radioactive materials (such as office buildings), as well

## **Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1**

as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet (unless noted otherwise in Reference 12) and backfilled to conform to local grade.

The cost to decommission the site, safeguard the spent fuel and GTCC waste until it can be transferred to the DOE for storage at a permanent offsite repository, and restore the impacted area of the site is estimated to be \$4.08 billion in 2022 dollars. The summary of the costs estimated for License Termination, Spent Fuel Management, and Site Restoration activities are presented in Table ES-1.

A further discussion of cost estimate development, categorization, and site-specific considerations are provided in the subsections below.

### **4.1. Approach**

PG&E used a dedicated team of nuclear, decommissioning, and DCPD experts to form a decommissioning plan, schedule, and associated cost estimate rather than relying on a generic nuclear industry decommissioning unit cost factor methodology. The SSDCE is based on cost-based and historical bid-based estimating, direct experience gained by PG&E after 10 years of full-scale decommissioning at HBPP Unit 3, industry expertise, and benchmarking. The planning team included experts in specific fields who understand the complexity and multi-discipline requirements for a project of this scale. This included PG&E leadership, decommissioning-experienced personnel, DCPD operating plant departmental personnel, specialty contractors, corporate legal, finance, and accounting.

In development of the initial SSDCE, Project management plans (PMPs) and studies were prepared to establish the site-specific baseline for decommissioning activities, costs, and an executable schedule. PMPs were prepared to develop the plans for major decommissioning evolutions, while studies were prepared to gather information on specific topics. This methodology allowed PG&E to evaluate options that minimize costs while adhering to PG&E established risk minimization and safety principles.

After each cost estimate was developed, the costs were grouped into categories (see Section 4 for a description of the categories), broken down into specific milestones with specified scopes of work (see below), and time phased using the project schedule.

Costs were further identified as discrete or unassigned. Discrete costs are those expenses that are directly attributable to an activity with specific completion criteria such as reactor pressure vessel removal. Unassigned costs are expenses not easily attributed to a discrete work scope such as staffing, waste, and transportation costs.

## **Diablo Canyon Power Plant Site-Specific Decommissioning Cost Estimate, Revision 1**

Discrete and unassigned cost designations are identified in Table ES-1 and Attachment A (Reference 12, Table 4-4). This information has been updated in Revision 1 of the SSDCE to reflect changes to the decommissioning plans and estimated costs for DCPD Units 1 and 2.

Attachment A provides a complete listing of the milestones and specified scopes of work and assigned each an identification number. Below are summaries of each milestone (Reference 12, Section 4.1.2.2):

### **(1) Decommissioning Program Oversight:**

This category includes costs related to the planning, monitoring, supervision, and management of decommissioning work and includes the following: (1) Key Oversight personnel (including senior site/decommissioning management); (2) Decommissioning oversight; and (3) Other costs associated with planning, monitoring, supervision and management of decommissioning work. These costs are necessary decommissioning costs that are unassigned, and not associated with a discrete scope of work.

### **(2) Site Costs:**

This category includes costs necessary to maintain and operate the site as a whole that adjust over time based on the completion of decommissioning phases and are not part of the Decommissioning Program Oversight functions. This milestone includes Security, Plant Management, Emergency Planning personnel and fees, Energy, Engagement Panel, the transfer of spent nuclear fuel and GTCC casks to a licensed facility, and other costs associated with maintaining and operating the site.

### **(3) Administrative and General (A&G):**

This category includes costs for corporate and site administrative activities necessary to support decommissioning that are not part of the Decommissioning Program Oversight or Site Costs Milestones. This Milestone includes the following (1) Administrative Staffing; (2) Non-labor costs associated with A&G Support; and (3) Other A&G Support costs that can be separately identified.

### **(4) Decommissioning Preparations:**

This category includes cold and dark power, security modifications, and site characterization. These preparations are all implemented early in the project lifecycle and will allow PG&E to either reduce staffing levels or enhance the ability to safely execute decommissioning.

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**(5) Site Infrastructure:**

This category includes onsite and offsite infrastructure improvements required to complete decommissioning such as a new security building, GTCC waste storage facility, laydown areas, railyards, and a waste management facility.

**(6) Large Component Removal:**

This category includes removal of steam generators (original and replacement), reactor heads (original and replacement), reactor coolant pumps, main generators, main turbines, and other various large components that must be removed prior to demolition. This category also includes the transportation and disposal costs of the components.

**(7) Reactor/Internals Segmentation:**

This category includes the reactor pressure vessel and reactor internals segmentation along with the packaging, transportation and disposal costs. This scope of work is highly specialized and includes the design and fabrication of custom tooling.

**(8) Spent Nuclear Fuel and Greater than Class C Transfer to Onsite Storage:**

This category includes the procurement of storage canisters/casks for both GTCC and spent fuel, the cost of loading spent fuel and GTCC into casks, and transferring of all casks from the fuel handling building to onsite storage locations.

**(9) Turbine Building:**

This category includes decontamination, system and area closure, and demolition of the Unit 1 and Unit 2 turbine building.

**(10) Auxiliary Building:**

This category includes decontamination, system and area closure, and demolition of the Unit 1 and Unit 2 auxiliary building.

**(11) Containment Building:**

This category includes decontamination, system and area closure, and demolition of the Unit 1 and Unit 2 containment buildings.

**(12) Fuel Handling Building:**

This category includes decontamination, system and area closure, and demolition of the Unit 1 and Unit 2 fuel handling building.

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**(13) Not Used.**

Original scope included in this milestone was re-located into another milestone during cost estimate development.

**(14) Balance of Site:**

This category includes decontamination, system and area closure, and demolition of all remaining common and unit specific structures.

**(15) Intake Structure:**

This category includes system and area closure to prepare the structure for barge loading and repurposing uses.

**(16) Discharge Structure Removal:**

This category includes installation of a coffer dam around the discharge structure, decontamination, system and area closure, removal of the discharge structure, and removal of the coffer dam.

**(17) Breakwater:**

This category is no longer applicable because the scope of work was removed.

**(18) Non-Independent Spent Fuel Storage Installation Site Restoration:**

This category includes underground utility and structure demolition, soil remediation, final site survey, and final grading, landscaping, and re-vegetation of the non-ISFSI portion of the site.

**(19) Spent Fuel Transfer to Department of Energy:**

Costs associated with this category are included in Site Costs.

**(20) Spent Nuclear Fuel and Greater than Class C Storage Demolition and Restoration:**

This category includes underground utility and structure demolition, soil remediation, final site survey, and final grading, landscaping, and revegetation of the SNF and GTCC storage locations.

**4.2. Basis of Estimate / Site-Specific Considerations**

Regulatory Guide 1.202 (Reference 3) and NUREG-1713 (Reference 4) delineate the items to be addressed in the SSDCE. PG&E has addressed these items in the subsections that follow.

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**4.2.1. Major Radioactive Component Removal**

The DCE provided to the CPUC in the 2021 NDCTP (Reference 12) provides a significant amount of information regarding the process of removing radioactive components. Reference to these sections for additional information is included below. Estimated costs for the following are provided in Attachment A:

- **Reactor Coolant Loops:** Removal is designated as System and Area Closure work scope and is accounted for in the respective containment building unit specific cost line items 11.02 and 11.05. Decontamination is accounted for in line items 11.01 and 11.04 and packaging and transportation of the waste is captured in line item 2. See Reference 12, Section 4.2.11.2 for a detailed description of containment building system and area closure.
- **Reactor Coolant Pumps:** Line item 6.05 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.5 for a detailed description of removal plans.
- **Bioshield:** The bioshield is comprised of mainly concrete and rebar. Therefore, its removal is designated as building demolition work scope. This work is accounted for in the respective containment unit specific demolition cost line items 11.03 and 11.06. Decontamination is accounted for in line items 11.01 and 11.04 and packaging and transportation of the waste is captured in line item 2. See Reference 12, Section 4.2.11.3 for a detailed description of containment demolition.
- **Pressurizer:** Line item 6.06 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.6 for a detailed description of removal plans.
- **Steam Generators:** Line item 6.03 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.3 for a detailed description of removal plans.
- **Reactor Vessel and Internals:** Line item 7 addresses removal, decontamination, packaging, transportation, and disposal. See Reference 12, Sections 4.2.7.1 and 4.2.7.2 for a detailed description of these plans.



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- **Control Rod Drive System:** Removal will take place with the reactor heads. Cost line item 6.04 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.4 for a detailed description of these plans.
- **Spent Fuel Racks:** Removal is designated as System and Area Closure work scope and is accounted for in the respective fuel handling building unit specific cost line items 12.02 and 12.05. Decontamination is accounted for in line items 12.01 and 12.04 and packaging and transportation of the waste is captured in line item 2. See Reference 12, Section 4.2.12.2 for a detailed description of fuel handling building system and area closure.
- **Spent Fuel Pool Cooling System:** Removal is designated as system and area closure work scope and is accounted for in the respective fuel handling building unit specific cost line items 12.02 and 12.05. Decontamination is accounted for in line items 12.01 and 12.04 and packaging and transportation of the waste is captured in line item 2. See Reference 12, Section 4.2.12.2 for a detailed description of fuel handling building system and area closure.
- **Spent Fuel Pool Liner:** Removal is designated as building demolition work scope and is accounted for in the respective auxiliary building unit specific demolition cost line items 10.03 and 10.06. Decontamination is accounted for in line items 12.01 and 12.04 and packaging and transportation of the waste is captured in line item 3. See Reference 12, Section 4.2.10.4 for a detailed description of auxiliary building demolition.
- **Draining and Processing of Spent Fuel Pool Water and Boron Waste:** The capability to process radiologically contaminated water is a necessary function during decommissioning. The water volume in the SFPs will need to be maintained for years after both units are shut down until all SNF and GTCC waste is transferred to the ISFSI and GTCC Waste Storage Facility, respectively. Portions of the existing liquid radiological waste facilities will remain available to support processing and disposing of the SFP water. Costs for water management are contained in line item 2.08. See Reference 12, Section 4.2.2.8.1 for a detailed description of radiological waste water processing.

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- **Contaminated Cranes:** Removal is designated as building demolition work scope and is accounted for in the respective building unit specific demolition cost items x.03 and x.06 (where x is the identification for each building in line items 9 through 12). Decontamination is accounted for in line items x.01 and x.04 and packaging and transportation of the waste is captured in line item 2. See Reference 12, Sections 4.2.9.3, 4.2.10.3, 4.2.11.3 and 4.2.12.3 for detailed descriptions of building demolition.
- **Turbine Generator(s):** Line item 6.08 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.8 for a detailed description of the main generator and exciter.
- **Main Condenser(s):** Line item 6.11 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.11 for a detailed description of the main condenser.
- **Moisture Separator Reheaters (MSRs):** Line item 6.11 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.11 for a detailed description of the MSRs.
- **Feedwater Heaters:** Line item 6.11 addresses removal, decontamination, packaging, and disposal. See Reference 12, Section 4.2.6.11 for a detailed description of the feedwater heaters.
- **Feedwater Condensate System:** Removal is designated as building demolition work scope and is accounted for in the respective turbine building unit specific demolition cost line items 9.03 and 9.06. Prior to demolition, the components will be made safe for removal during system and area closure that is accounted for in line items 9.02 and 9.05. Packaging and transportation of the waste is captured in line item 2. See Reference 12, Section 4.2.9.3 for a detailed description of turbine building demolition.
- **Feedwater Pumps/Turbine Drives:** Removal is designated as building demolition work scope and is accounted for in the respective turbine building unit specific demolition cost line items 9.03 and 9.06. Prior to demolition, the components will be made safe for removal during system and area closure that is accounted for in line items 9.02 and 9.05. Packaging and transportation of the waste is captured in line item 2. See

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Reference 12, Section 4.2.9.3 for a detailed description of turbine building demolition.

- **Floor Drains:** Removal will occur with the structures during building demolition. If they are embedded in the portions of concrete foundations that are not being removed (i.e., the base slabs and exterior walls of the auxiliary and turbine Buildings), then they will be sampled and decontaminated if possible, and abandoned with the foundation. If they cannot be decontaminated successfully, they will be locally removed from those foundations prior to abandonment. The costs for removal of the floor drains is therefore captured in the building demolition line items x.03 and x.06 (where x is the identification for each building in line items 9 through 12) for each individual affected structure. Decontamination is accounted for in line items x.01 and x.04 and packaging and transportation of the waste is captured in line item 2. See Reference 12, Sections 4.2.9.3, 4.2.10.3, 4.2.11.3 and 4.2.12.3 for detailed descriptions of building demolition.
- **Heating, Ventilation, and Air Conditioning Ducts, Equipment:** Removal is designated as building demolition work scope and is accounted for in the respective building unit specific demolition cost items x.03 and x.06 (where x is the identification for each building in line items 9 through 12). Decontamination is accounted for in line items x.01 and x.04 and packaging and transportation of the waste is captured in line item 3. See Reference 12, Sections 4.2.9.3, 4.2.10.3, 4.2.11.3, and 4.2.12.3 for detailed descriptions of building demolition.

#### **4.2.2. Radiological Decontamination**

As discussed in Reference 12, Section 4.2.21.1.5, after removal, remediation, and/or abatement of all known hazardous and/or regulated materials, there are two remaining scopes of work related to building decontamination.

- Before open-air structural demolition, structures are prepared by applying either a fixative and/or some other form of lockdown media to seal off loose radiological contamination to prevent the migration of loose radiological contamination during demolition activities in the form of airborne radiological contamination.
- After demolition is complete, remaining surfaces of a structure that will be left in-place will be radiologically decontaminated. The decontamination will support final status survey operations and the follow-up independent

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third-party confirmatory surveys before 10 CFR Part 50 licenses are terminated (see Section 4.2.3 below).

Structural surfaces (concrete or steel) will be radiologically decontaminated to accomplish either of the following:

- Prepare a structure for open-air demolition when the application of either fixative or some other form of lockdown media is deemed insufficient to seal off loose contamination.
- Remediate remaining structural surfaces to the site-specific Derived Concentration Guideline Level, thereby enabling and facilitating termination of the 10 CFR Part 50 licenses.

Remaining concrete surfaces of impacted structures will be decontaminated by removing concrete either by scabbling or other abrasive means in accordance with the structure's NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (Reference 8) Classification. Similarly, remaining structural steel surfaces of impacted structures will be decontaminated to a bare bright finish by either abrasive blasting or mechanical abrading in accordance with the same MARSSIM Classification. See Reference 12, Section 4.2.21.1.5 for detailed description of building decontamination.

To support a decontamination cost estimate, PG&E used plant drawings and subject matter experts to estimate the amount of contaminated concrete (see Table 4-1) and determine contaminated equipment (Table 4-2).

**Table 4-1: Concrete Requiring Radiological Decontamination or Removal**

Building	Area of Concrete Decontaminated (ft <sup>2</sup> )	Decontamination Concrete Removal (ft <sup>3</sup> )	Total contaminated concrete removed (ft <sup>3</sup> )
Containment	242,014	5,042	875,166
Turbine	51,470	1,072	206,939
Auxiliary	129,988	2,708	982,237
Fuel Handling	4,084	85	
Discharge Piping	7,854	164	164
Misc. Buildings			297,983
<b>Total contaminated concrete removed from site</b>			<b>2,362,489</b>

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**Table 4-2: Contaminated Equipment and Piping**

<b>Equipment Category</b>	<b>Length of Piping in Feet or Number of Items in Each Category</b>
Piping diameter > 3 inches	14,232 ft.
Piping diameter < 3 inches	42,069 ft.
Tanks of all sizes	87
Pumps	161
Heat Exchangers	40
Miscellaneous Components	172

In addition to surface decontamination, PG&E evaluated various methods available for reducing the radioactive source term in contaminated systems exposed to radioactive fluids. The DCE includes costs in the respective building unit specific decontamination Attachment A line items 10.01, 10.04, 11.01, and 11.04 for performing chemical decontamination of the reactor coolant piping, pressurizer, chemical volume and control system, and residual heat removal system to reduce worker exposure during the decommissioning work. Reference 12, Sections 4.2.10.1 (auxiliary building) and 4.2.11.1 (containment) provide additional details on the decontamination evaluation process and results.

Reference 12, Section 4.2.10 (auxiliary building), 4.2.11 (containment), 4.2.12 (fuel handling building), and 4.2.14 (other buildings in the RCA) provide a description of the buildings inside the radiologically controlled area. As noted in Section 4.2.3 below, there are currently not any known inaccessible areas that may contain radiological contamination.

#### **4.2.3. Site Characterization / Final Site Survey / Remediation**

Site characterization will be conducted in two phases: (1) a preliminary characterization during plant operations, and (2) a post-shutdown site characterization. Once physical dismantlement and any necessary decontamination is completed for a given area, final status surveys are conducted to demonstrate that an area conforms to the radiological release criteria for license termination. Furthermore, remediation may be necessary to meet regulatory requirements. Each topic is discussed below.

##### **Preliminary Characterization** (Reference 12, Section 4.2.4.5)

A historical site assessment (HSA) was performed for the site in 2018. This investigation collected information regarding the site history from the start of operations to the present and used the following sources of information:

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- annual environmental reports
- annual effluent reports
- licensee event reports
- 10 CFR 50.75(g) files
- groundwater sampling data
- radiation survey data
- area and boundary locations for radiological areas
- corrective action reports
- personnel interviews

The HSA identified potential non-radiological contamination (i.e., petroleum hydrocarbons, asbestos, and lead paint) and potential radioactive contamination. Both radiological and potential non-radiological contamination warrant additional investigation as part of the site characterization plan to be performed upon plant shutdown. Based on the results of the HSA, there are currently not any known inaccessible areas that may contain radiological contamination. See Reference 12, Section 4.2.4.5 for examples of radiological and non-radiological findings.

Regulations require minimizing, preventing, and documenting both radiological and chemical-related contamination and spill events. Robust programs and initiatives are in place to minimize and prevent both. They include:

- the 2006 Nuclear Energy Institute groundwater protection initiative (GPI 07-007), which establishes standards for sampling and reporting groundwater monitoring;
- the Buried Piping Program, which analyzes and inspects below-grade piping;
- the Radiological and Environmental Monitoring Program, which monitors for radioactive contamination in the environment;
- the Effluents Control Program administered by the Offsite Dose Calculation Manual, which regulates and monitors radioactive effluents;
- the Spill Prevention Countermeasure and Control Program, which catalogs and develops procedures and controls to prevent hydrocarbon spills; and
- the Storm Water Pollution Prevention Plan, which controls site exposure to rainfall and potential pollutants.

As a result of these initiatives, all feasible efforts are being made to prevent chemical or radiological contamination that could harm humans and/or the environment. If a significant spill occurs, the event is immediately documented in



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the corrective action program. If a spill cannot be completely cleaned up or mitigated, the event will be documented as required by 10 CFR 50.75(g). Any government regulatory agency may require interim or complete cleanup of a spill or contamination event if the event could harm humans or the environment.

### **Post-Shutdown Site Characterization** (Reference 12, Section 4.2.4.5)

The approximately 750-acre industrial portion of the DCPD site will be characterized for both radiological contamination and non-radiological contaminants of concern. Physical sampling and analysis will occur after Unit 1 and Unit 2 are shut down. The purpose of the Site Characterization Study is, through the formal Data Quality Objectives process, to determine the extent and nature of radiological and non-radiological contamination that may exist at DCPD.

Radiological characterization will be conducted in accordance with NUREG-1575 (Reference 8). Non-radiological hazardous characterization will be in accordance with both federal and California Environmental Protection Agency standards.

The following are the types of processes that may be used in the Site Characterization Study:

- grab sample techniques for surface soils
- soil boring for subsurface soils
- coring for volumetric concrete samples
- smear techniques for loose surface contamination
- direct radiation measurements
- gamma radiation spectroscopy
- liquid scintillation counting for tritium analysis
- radiochemical analysis for hard-to-detect species such as iron-55 and nickel-63
- volumetric samples for hazardous materials analysis (for non-radiological characterization only)
- scrape samples for coatings analysis (for non-radiological characterization only)

Estimated costs for site characterization are shown in Attachment A, line 4.07.

### **Final Status Surveys**

After completing site decommissioning activities, the final status surveys will be performed to demonstrate that the remediated portion of the site (excluding the ISFSI containing the spent fuel and GTCC waste) can be released for unrestricted use and terminate the 10 CFR 50 license. The site release criteria is

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defined by the MARSSIM protocol and is in general 25 millirem per year from all pathways. Adherence to the NRC-approved License Termination Plan and MARSSIM guidance will ensure that the surveys are conducted so that applicable regulatory criteria are satisfied.

Estimated final status survey costs are shown in Attachment A, line 18.03.

**Soil Remediation** (Reference 12, Section 4.2.18.2)

The extent of soil contamination within the site will be defined by the Post-Shutdown Site Characterization. Soil remediation is carried out to reduce (1) soil radioactive contamination to levels that meet NRC's radiological release criteria for unrestricted use and (2) non-radioactive soil contamination to levels that meet the California Department of Toxic Substances Control (governed by the California Environmental Protection Agency) chemical cleanup standards which will comply with federal Environmental Protection Agency water quality standards at a minimum. Soil remediation includes the logistical, planning, resources, and physical work required to excavate contaminated soils in conjunction with demolition, excavation, and final site restoration activities. Estimated costs for soil remediation are shown in Attachment A line item 18.02.

Active groundwater remediation is not anticipated for DCP, as groundwater monitoring has not identified tritium at the well that is used for a drinking water source (located up DC, away from the power block).

**4.2.4. Waste Disposal**

Prior to demolition, material slated for removal will be evaluated to identify what can be repurposed (or reused), recycled or disposed of as waste. This approach minimizes costs and is environmentally responsible. Materials designated for reuse will be clean materials that have another use on-site, avoiding transportation and disposal costs. Materials designated for recycling will be clean materials that still possess usable value but are not usable on-site. These materials will be transported to a recycling facility, incurring transportation costs but no disposal costs. Off-site disposal will be considered in cases where neither reuse nor recycling are possible because the material contains radiological (as defined by 10 CFR 20.2002 and 10 CFR 61 classifications) or hazardous/regulated contaminants, is not suitable for recycling, or when it is not economical.

Demolition methods and handling techniques will be selected to minimize cross-contaminating clean materials with those required to be disposed of as wastes. To minimize cross-contamination with clean materials, the clean materials will be removed first prior to building demolition if it will be reused, recycled or

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repurposed and segregated from the transportation and storage areas used for radiological or hazardous/regulated materials.

PG&E has evaluated the site and detailed the types and quantities of each material on site to determine the lowest cost option, including what quantities of material could be reused onsite instead of shipped offsite for recycling or disposal. PG&E determined the estimated cost of disposal based on the type and amount of material, disposal location, and transportation method. Table 4-3 provides a comparison of total Class A, B/C, and GTCC waste volumes for DCPD decommissioning. Estimated radiological and non-radiological waste volumes, transportation details, and costs for transportation and disposal (including processing fees where applicable) are presented in Table 4-4 with no contingency (Reference 12, Table 3-3). Table 4-4 also identifies the associated cost line items in Attachment A (which include contingency). Costs for packaging LLW are embedded within Attachment A cost line items 2.17, 6 and 7.

**Table 4-3: Waste Material Volumes**

Waste Class	Volume (ft <sup>3</sup> )	Percent
Class A	1,655,980	
Class B and C		
GTCC		
<b>Total</b>		

PG&E determined that a plan which uses a “blended” approach of barges and trucks is best for the shipment of bulk waste from DCPD compared to the previous strategy of using truck and rail transport. This “blended” approach to transportation reduces risk and environmental impact, while meeting cost and volume requirements.

GTCC waste will be managed and stored onsite until the DOE accepts the waste for final disposition, or until an appropriately licensed facility becomes available. The GTCC waste consists of materials presently stored in the SFPs and waste generated during reactor internal segmentation. The segmentation plan will use characterization information and an activation analysis to minimize the quantity of GTCC waste, and the packaging plan will reflect the segmentation plan. It is anticipated that up to 10 GTCC waste canisters will be required for the storage of GTCC waste from decommissioning activities.

Reference 12, Section 3.3 provides additional information related to waste reduction and transportation and disposal site options evaluated.

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**Table 4-4: Materials Transportation and Disposal Costs (2022 dollars)<sup>(1)</sup>**

Type of Waste	Waste (tons)	Waste Volumes (ft³)	Transportation Cost	Disposal Cost	Total T & D Cost	Attachment A Cost Line Items (1)
Clean Waste						
Non-Rad Disposal	16,907	371,739				Portions of 2, 9, 10, 11, 12, 14, 18 and 20
Non-Rad Recycle	112,706	1,408,829				
		Non-Rad Subtotal				
Radiological and Regulated Waste						
Other Regulated Waste	27,836	695,912				Portions of 2, 9, 10, 11, 12, 14, 18 and 20
LARW (20.2002)	257,730	3,700,931				
Licensed Class A	104,476	1,395,236				
Class B/C	N/A					
Large Component Class A	7,760	174,326				Portion of 6
RPV/RVI Activities						Portion of 7
Class A (Containerized and bulk)	1,598	86,418				
Class B	345					
Class C	115					
		Rad and Reg. Subtotal				
		Grand Totals				

**(1)** Costs do not align with the Attachment A line items identified because values in Table 4-4 do not include contingency.

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**4.2.5. Decommissioning Staffing and Fees**

**Staffing**

Table 4-5 presents labor costs and the labor requirements by decommissioning period as defined in Table 3-1. "Management/Support Staff" include staffing for Attachment A line items 1 through 3. "Decommissioning Crews" identifies the staffing requirements for Attachment A line items 4 through 20 and a portion of line item 2. Attachment A, Columns L and M further provide labor costs by each cost line item. Personnel costs are based upon established PG&E rates and established industry rates.

At permanent cessation of Unit 2 operations, staffing is estimated to be reduced from current levels and is expected to decrease as the SNF is moved from the SFP to the ISFSI, and as requirements for security and emergency planning are reduced.

**Fees**

Estimated costs for the following are provided in Attachment A. Further description of the following items are provided in various subsections of Reference 12, Section 4.2.

- Energy: line item 2.04
- Insurance: line item 3.03
- Property Tax: line item 3.04
- NRC Reviews and Fees: line item 2.05
- Consumables: line item 2.15

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**Table 4-5: Labor Costs and Average Labor Requirements by Decommissioning Phase  
(thousands of 2022 dollars)**

Periods	2 - Zirc Fire		3 - Wet Storage		4 - Building Demolition		5 - Non-ISFSI Site Restoration		6 - ISFSI Operations		7 - SNF and GTCC Storage Demolition and Restoration	
	Labor FTE	Labor Cost	Labor FTE	Labor Cost	Labor FTE	Labor Cost	Labor FTE	Labor Cost	Labor FTE	Labor Cost	Labor FTE	Labor Cost
<b>Decommissioning Crews</b>	436	\$267,739	491	\$221,846	296	\$289,566	127	\$70,571	8	\$71,717	46	\$49,471
<b>Management/Support Staff</b>	131	\$219,660	478	\$191,495	187	\$190,991	131	\$77,621	34	\$236,754	6	\$219,660
<b>Total</b>	567	\$487,399	970	\$413,341	483	\$480,557	258	\$148,192	42	\$308,470	51	\$269,131

FTE – Full-Time Equivalents



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### **4.3. Assumptions**

As discussed in greater detail in Reference 12 the following are major assumptions affecting decommissioning costs (Reference 12, Section 1.6):

#### **Regulatory Approvals and Permits**

PG&E will require many regulatory approvals and permits to decommission DCP. These are critical items and require close coordination with federal, state, and local agencies. Delays in obtaining – or failure to obtain – approval and/or possible regulatory conditions could significantly impact estimated costs. As an example, PG&E's water management plan is based on two assumptions with major financial implications: (1) PG&E will obtain an extension of its California State Lands Commission (CSLC) lease to continue use of the intake cove and discharge structures for drawing in ocean water and discharging waste water to the ocean; and (2) PG&E will obtain a National Pollutant Discharge Elimination System permit to allow for discharges of waste water to the Pacific Ocean during decommissioning. Failure to obtain either of these approvals would delay decommissioning and result in significant additional costs. (See Reference 12, Section 3.4 for additional information.)

#### **California State Lands Commission Lease Requirements**

PG&E has a CSLC lease that requires PG&E to remove the DCP intake structure, breakwaters, and discharge structure at the termination of the lease. In accordance with PG&E's commitments under the 2018 NDCTP Settlement, PG&E has continued to explore options for repurposing of facilities and structures at DCP. The updated DCE assumes retention of the Breakwater, and Intake Structure (collectively "DCP Marina"). (See Reference 12, Section 3.5 for additional information.)

#### **Waste Disposal**

PG&E's current waste disposal plan involves taking several proactive steps to minimize the volumes of waste that must be disposed of and to utilize the most cost-effective waste disposal options. (See Reference 12, Section 3.3 for additional information.)

#### **Security**

PG&E has conducted a comprehensive review involving state-of-the-art software and site walk downs of DCP security requirements pre- and post-unit shutdown. PG&E's post-shutdown security plan has been independently reviewed by a third-party expert consultant. PG&E also has identified several cost mitigation measures, including (1) plant modifications which will reduce the number of necessary security personnel; and (2) affirmative steps which PG&E may take prior to the beginning of each phase of decommissioning to reduce the number of security personnel. (See Reference 12, Section 3.2 for additional information.)

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### Spent Nuclear Fuel

The SSDCE is based on assumptions that: (1) PG&E will complete transfer of SNF and GTCC waste from the SFPs to the ISFSI 3.25 years after the Unit 2 shutdown; and (2) the DOE will begin collecting SNF in the nuclear industry in 2031 and will specifically begin picking up SNF at DCPD in 2038. (See Reference 12, Sections 3.1 and 4.2.2.22 for additional information.)

### Pre-Planning

PG&E will conduct significant planning for decommissioning prior to the shutdown of Unit 1. This early planning will permit PG&E to begin decommissioning immediately upon Unit 2 shutdown and will result in significant cost savings. (See Reference 12, Section 2 for additional information)

### 4.4. Inflation

The estimates presented in this report were developed in 2021 dollars for the DCE (Reference 12) and escalated to 2022 dollars. Escalation of future decommissioning costs over the remaining decommissioning project life-cycle are presented in Table 4-6.

**Table 4-6: Diablo Canyon Power Plant Units 1 and 2 Annual Escalation Rates**

Year	PG&E Labor	Materials Equipment <sup>1</sup>	Contract Labor	Burial Costs	Other
2022	0.0347	0.0227	0.0338	0.0415	0.0204
2023	0.0347	0.0140	0.0338	0.0415	0.0208
2024	0.0347	0.0154	0.0309	0.0415	0.0224
2025	0.0347	0.0159	0.0296	0.0415	0.0233
2026	0.0347	0.0169	0.0297	0.0415	0.0238
2027	0.0347	0.0168	0.0298	0.0415	0.0238
2028	0.0347	0.0176	0.0291	0.0415	0.0236
2029	0.0347	0.0180	0.0287	0.0415	0.0236
2030	0.0347	0.0184	0.0291	0.0415	0.0234
2031	0.0347	0.0187	0.0289	0.0415	0.0235
2032	0.0347	0.0191	0.0297	0.0415	0.0229

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<b>Year</b>	<b>PG&amp;E Labor</b>	<b>Materials Equipment<sup>1</sup></b>	<b>Contract Labor</b>	<b>Burial Costs</b>	<b>Other</b>
2033	0.0347	0.0194	0.0299	0.0415	0.0229
2034	0.0347	0.0195	0.0299	0.0415	0.0229
2035	0.0347	0.0194	0.0299	0.0415	0.0228
2036	0.0347	0.0195	0.0299	0.0415	0.0228
2037	0.0347	0.0196	0.0299	0.0415	0.0228
2038	0.0347	0.0198	0.0299	0.0415	0.0227
2039	0.0347	0.0198	0.0299	0.0415	0.0225
2040	0.0347	0.0197	0.0299	0.0415	0.0225
2041	0.0347	0.0194	0.0299	0.0415	0.0221
2042	0.0347	0.0194	0.0299	0.0415	0.0222
2043	0.0347	0.0195	0.0299	0.0415	0.0222
2044	0.0347	0.0194	0.0299	0.0415	0.0222
2045	0.0347	0.0194	0.0299	0.0415	0.0222
2046	0.0347	0.0195	0.0299	0.0415	0.0222
2047	0.0347	0.0195	0.0299	0.0415	0.0222
2048	0.0347	0.0195	0.0299	0.0415	0.0222
2049	0.0347	0.0196	0.0299	0.0415	0.0222
2050	0.0347	0.0196	0.0300	0.0415	0.0223
2051	0.0347	0.0196	0.0299	0.0415	0.0222
2052	0.0347	0.0196	0.0299	0.0415	0.0223
2053	0.0347	0.0196	0.0299	0.0415	0.0223
2054	0.0347	0.0196	0.0299	0.0415	0.0223
2055	0.0347	0.0196	0.0299	0.0415	0.0223

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<b>Year</b>	<b>PG&amp;E Labor</b>	<b>Materials Equipment<sup>1</sup></b>	<b>Contract Labor</b>	<b>Burial Costs</b>	<b>Other</b>
2056	0.0347	0.0196	0.0299	0.0415	0.0223
2057	0.0347	0.0196	0.0299	0.0415	0.0223
2058	0.0347	0.0196	0.0299	0.0415	0.0223
2059	0.0347	0.0196	0.0299	0.0415	0.0223
2060	0.0347	0.0196	0.0299	0.0415	0.0223
2061	0.0347	0.0196	0.0299	0.0415	0.0223
2062	0.0347	0.0196	0.0299	0.0415	0.0223
2063	0.0347	0.0196	0.0299	0.0415	0.0223
2064	0.0347	0.0196	0.0299	0.0415	0.0223
2065	0.0347	0.0196	0.0299	0.0415	0.0223
2066	0.0347	0.0196	0.0299	0.0415	0.0223
2067	0.0347	0.0196	0.0299	0.0415	0.0223
2068	0.0347	0.0196	0.0299	0.0415	0.0223
2069	0.0347	0.0196	0.0299	0.0415	0.0223
2070	0.0347	0.0196	0.0299	0.0415	0.0223
2071	0.0347	0.0196	0.0299	0.0415	0.0223
2072	0.0347	0.0196	0.0299	0.0415	0.0223
2073	0.0347	0.0196	0.0299	0.0415	0.0223
2074	0.0347	0.0196	0.0299	0.0415	0.0223
2075	0.0347	0.0196	0.0299	0.0415	0.0223
2076	0.0347	0.0196	0.0299	0.0415	0.0223

Note 1 – Materials: The materials and equipment escalator for DCP Unit 1 and 2 is based on 41 percent materials weight and 59 percent heavy equipment.

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#### **4.5. Contingency**

This section discusses contingency factors as they relate to nuclear decommissioning and PG&E's contingency level used in its DCE, as discussed in Reference 12, Section 3.6.

##### **4.5.1. Definition of Contingency in Nuclear Decommissioning Context**

Contingency in the context of forecasting nuclear decommissioning expenditures has a specific meaning: the contingency factor is meant to account for the difference between the base cost and unforeseen, but anticipated, costs. The base cost estimate defines the project scope and accounts for the known and reasonably anticipated costs of decommissioning in the future. The contingency factor accounts for unforeseen costs within the defined activity scope (i.e., events that will occur in the field during the implementation of the overall decommissioning work period and which are not accounted for in the base cost estimate). For example, the mechanical failure of heavy equipment, tool breakage, weather delays, and the flooding of a trench are all known unknown events that increase the cost of decommissioning activities. Such cost increases are deemed to be within the scope of the decommissioning project because they occur during the conduct of an activity that is included in the base estimate. At the same time, they are unforeseeable because no one can predict when equipment will break or when the weather will cause delays (causing rescheduling of activities, inefficiencies in production, loss of productivity, overtime, slippages, etc.).

The events covered under contingency are often characterized as the “known unknowns” that will occur over the duration of a decommissioning project. Contingency factors in this sense reflect only one type of risk – the specific risks of increased costs resulting from conditions at the project site after the commencement of the decommissioning work. Contingency dollars provide assurance that sufficient funding is available to accomplish the intended project scope and are expected to be fully expended during decommissioning. An estimate without contingency, or an inadequate allowance for contingency, can result in significant schedule delays and increased costs associated with delays if the project is unable to proceed. This definition of contingency does not include scope changes, or “unknown unknowns” such as a change in regulatory criteria, significant natural disasters, and security or terrorist activity.

##### **4.5.2. Contingency for DCE**

PG&E evaluated current industry and regulatory guidance to determine the appropriate contingency factor to estimate decommissioning costs. The most recent NRC advice (Reference 9) states that:

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In general, a contingency of 25 percent applied to the sum of all estimated decommissioning costs should be adequate, but in some cases a higher contingency may be appropriate. The 25 percent contingency factor provides reasonable assurance for unforeseen circumstances that could increase decommissioning costs and should not be reduced or eliminated simply because foreseeable costs are low. Proposals to apply the contingency only to selected components of the cost estimate, or to apply a contingency lower than 25 percent, should be approved only in circumstances when a case-specific review has determined there is an extremely low likelihood of unforeseen increases in the decommissioning costs (e.g., if the decommissioning costs are highly predictable and are established by binding contracts.)

PG&E has calculated contingency at the line item level. However, PG&E has not adjusted the overall contingency to 25 percent. Table 4-7 identifies the contingency percentage adopted by PG&E for each line item cost category. Except for staffing costs estimated for pre-shutdown planning activities, all costs shown in the DCE include an overall contingency factor of approximately 20.2 percent. PG&E believes that this contingency level is appropriate given the current stage of decommissioning.

**Table 4-7: Diablo Canyon Power Plant Decommissioning Contingency**

No. <sup>1</sup>	Cost Category	Contingency Factor
1	Decommissioning Contingency	10.6%
2	Site Costs	15.6%
3	Administration & General	13.1%
4	Decommissioning Preparations	21.1%
5	Site Infrastructure	15.0%
6	Large Component Removal	25.0%
7	Reactor/Internals Segmentation	44.0%
8	Spent Nuclear Fuel and Greater than Class C Transfer to Onsite Storage	14.9%
9	Turbine Building	34.9%
10	Auxiliary Building	28.0%
11	Containment	30.1%
12	Fuel Handling Building	27.4%
14	Balance of Site	21.1%
15	Intake Structure	15.0%
16	Discharge Structure	18.0%

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No. <sup>1</sup>	Cost Category	Contingency Factor
18	Non-ISFSI Site Restoration	21.6%
20	Spent Nuclear Fuel and Greater than Class C Storage Demolition and Restoration	21.3%
<b>GRAND TOTAL</b>		<b>20.2%</b>

<sup>1</sup> Note: Costs associated with IDs 13 and 19 were moved under other IDs, and therefore, are not shown in this table. Costs associated with ID 17 are no longer applicable, and therefore, are not shown in this table.

## 5. Schedule of Planned Decommissioning Activities

### 5.1. Decommissioning Schedule

The project schedule provides not only a road map for systematic project execution but also the means by which to gauge progress, identify and resolve potential cost estimate problems, and promote accountability at all levels of the estimate. A schedule provides a time sequence for the duration of a project's activities and aids in understanding the dates for major milestones and the activities that drive the schedule. A project schedule was used as a vehicle for developing a project cost baseline. (Reference 12, Section 5.2)

The overall decommissioning project schedule was divided into two areas as shown in Figures 5-1 and 5-2, respectively: (1) DCPD Demolition and Site Restoration, and (2) ISFSI Demolition and ISFSI Site Restoration. The schedules provided herein assume that PG&E completes detailed DCPD decommissioning pre-shutdown planning and that DCPD ceases operation upon expiration of the operating licenses. The schedule ends following DC ISFSI decommissioning and restoration.

#### **DCPD Demolition and Site Restoration** (Reference 12, Section 5.2.1.1)

Figure 5-1 (Reference 12, Figure 5-1) provides the level 3 schedule for non-ISFSI decommissioning. As shown in Figure 5-1, the total decommissioning time for each unit is minimized by parallel work activities. For example, because each unit has a specific shutdown date (November 2024 for Unit 1 and August 2025 for Unit 2), the Unit 1 activities will begin while Unit 2 is still operating, including transferring the Unit 1 spent fuel from the reactor to the Unit 1 SFP to continue cooling.

The DCPD Demolition and Site Restoration schedule depends heavily on the availability of buildings for demolition and then site restoration. For example, systems are needed to support SFP cooling until the spent fuel and GTCC waste are transferred to the DC ISFSI. The DCPD Demolition and Site Restoration schedule is also based on key considerations such as ensuring safe working conditions and minimizing environmental impacts.

#### **Independent Spent Fuel Storage Installation Demolition and Independent Spent Fuel Storage Installation Site Restoration** (Reference 12, Section 5.2.1.2)

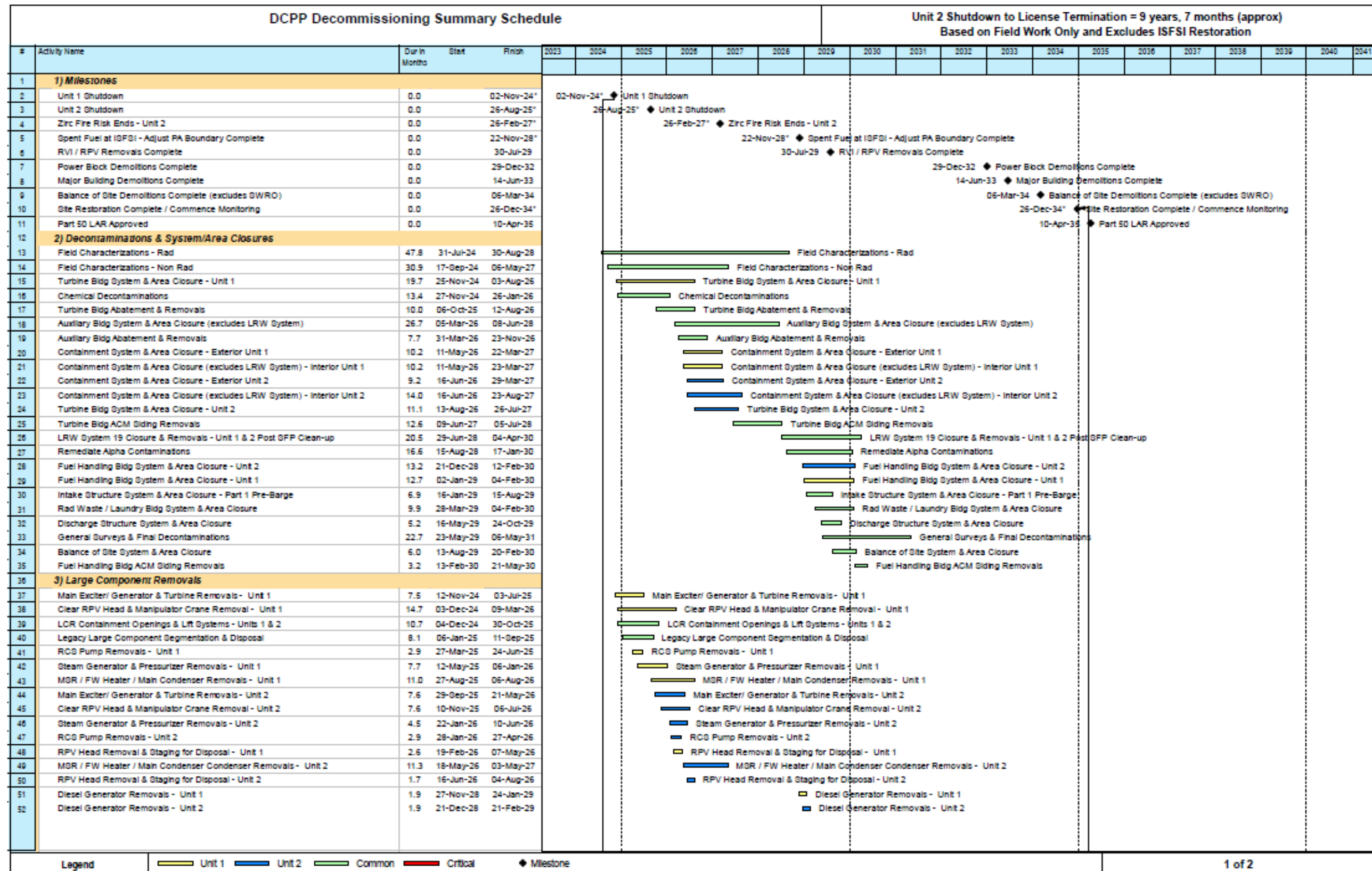
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Figure 5-2 (Reference 12, Figure 5-2) provides the level 3 schedule for ISFSI Demolition and ISFSI Site Restoration. It includes the time that the SNF and GTCC waste will be stored at the DC ISFSI and GTCC Waste Storage Facility respectively, (termed ISFSI operations), as well as the period of time that the ISFSI/GTCC Waste Storage Facility will be demolished (after the DOE has taken possession of all materials stored at the facilities), and time for the ISFSI/GTCC Waste Storage Facility sites to be restored. The schedule does not show the biological monitoring that ends in 2076. The total duration of this phase is minimized by parallel work activities. This schedule depends heavily on the DOE schedule for taking possession of the DCPD SNF and GTCC waste.

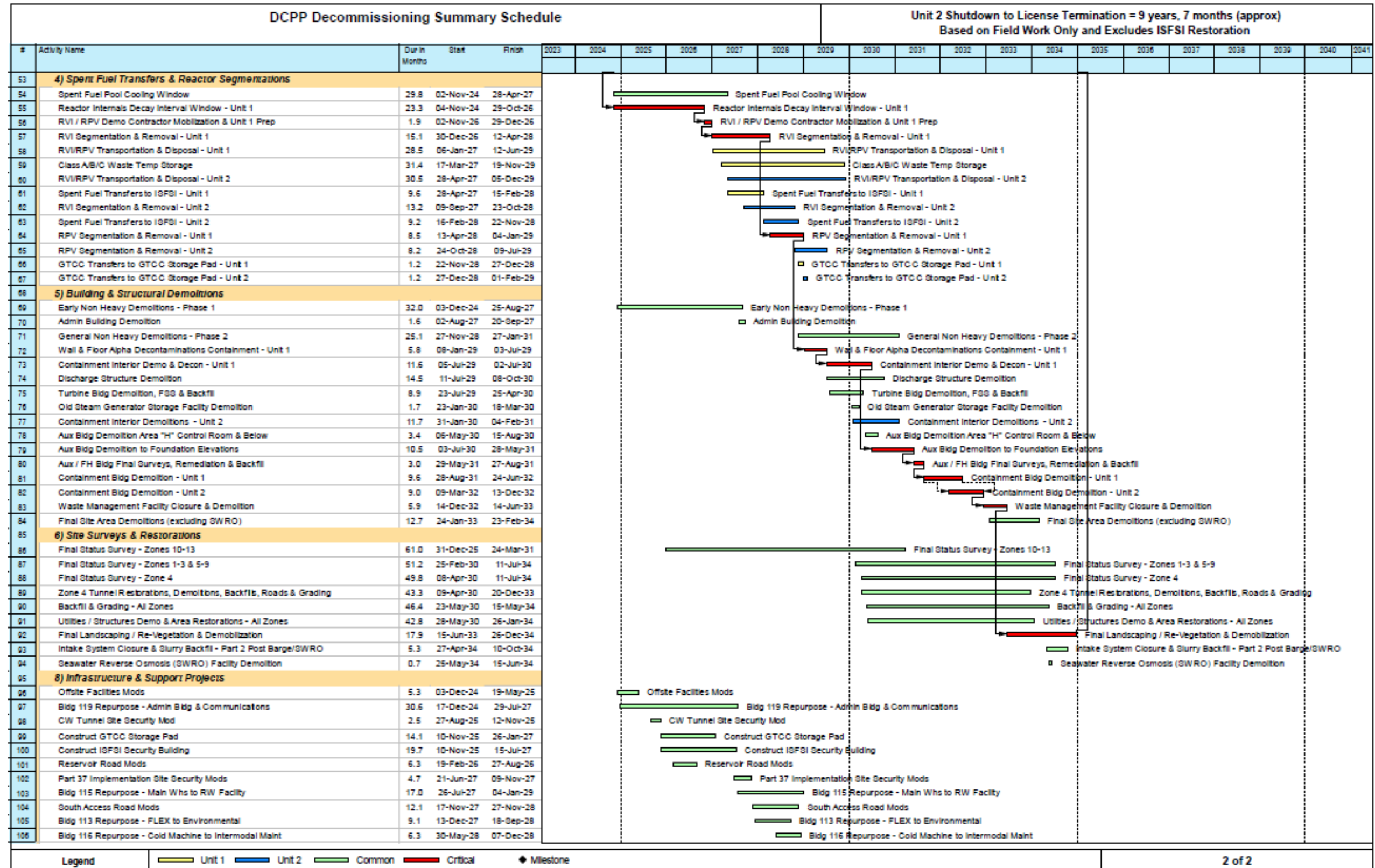


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**Figure 5-1: Diablo Canyon Power Plant Demolition and Site Restoration Schedule**



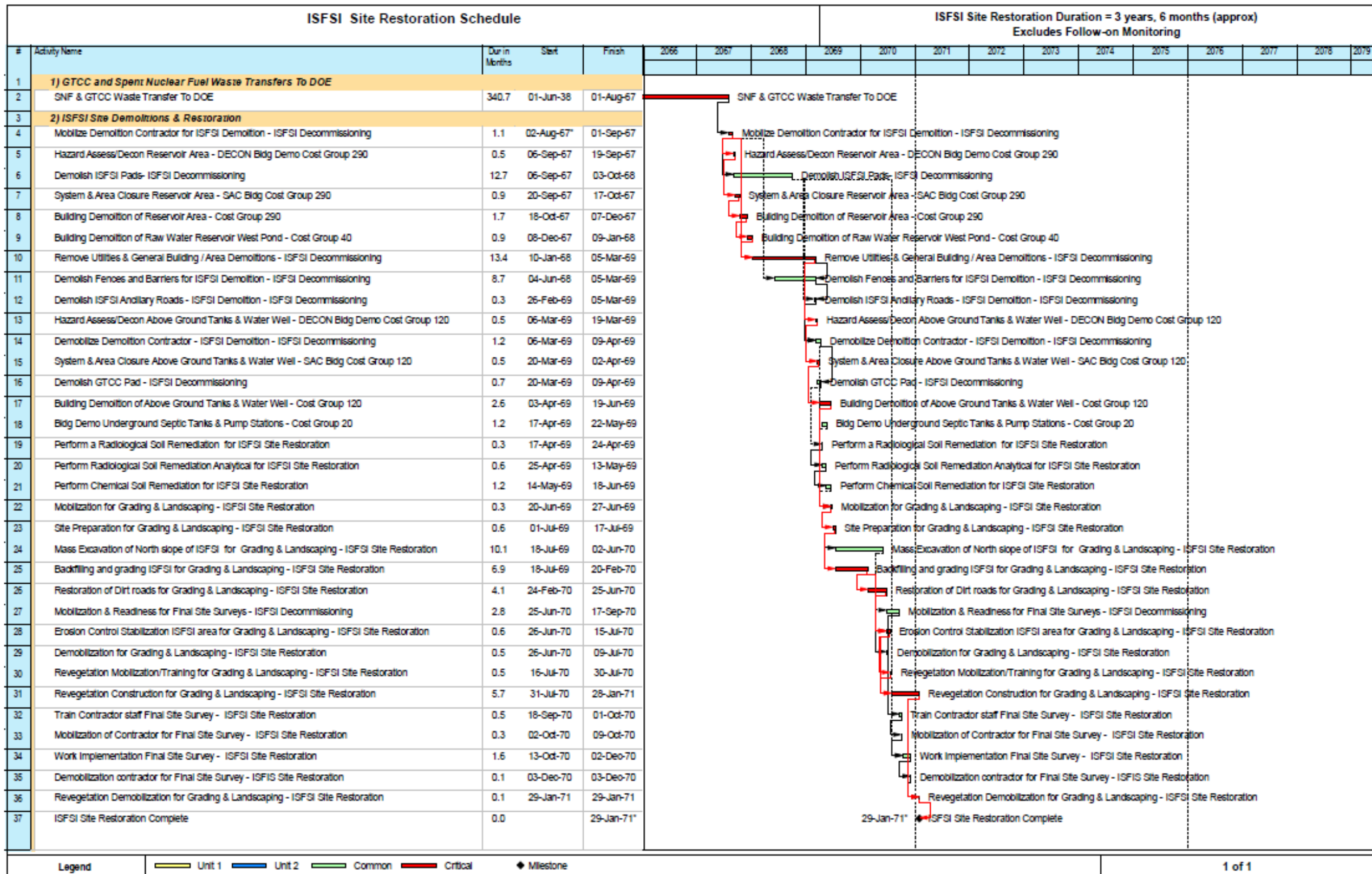
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**Figure 5-2: Independent Spent Fuel Storage Installation Demolition and Independent Spent Fuel Storage Installation Site Restoration Schedule**



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**5.2. Decommissioning Funds**

10 CFR 50.82(a)(6)(iii) states that, "Licensees shall not perform any decommissioning activities," as defined in 10 CFR 50.2 that, "Result in there no longer being reasonable assurance that adequate funds will be available for decommissioning." PG&E does not intend to perform any decommissioning activities that would jeopardize the availability of adequate funds for the completion of radiological decommissioning.

Tables 5-1 and 5-2 show the amount of decommissioning funds currently available, the cumulative cost estimate, and the expenditure of the funds for Units 1 and 2, respectively. (Reference 1, Enclosure 2)

Under NRC regulations (10 CFR 50.82(a)(8)), a licensee must provide reasonable assurance that funds will be available (or "financial assurance") for decommissioning (i.e., license termination) costs. The regulations also describe the acceptable methods a licensee can use to demonstrate financial assurance. Most licensees do this by funding a nuclear decommissioning trust (NDT) fund. To assure that sufficient funds will be available for decommissioning, PG&E has established separate external sinking NDT fund accounts for DCPD Units 1 and 2. PG&E currently has more funds in the NDT for DCPD Units 1 and 2 than required to meet the minimum NRC decommissioning amount for each unit that was calculated pursuant to the requirements of 10 CFR 50.75(c).

In addition, on September 10, 2019 (Reference 11), NRC granted exemptions from 10 CFR 50.82(a)(8)(ii) and 10 CFR 50.82(a)(8)(i)(A) to allow PG&E to withdraw \$187.8 million (\$2017) from the DC NDT for decommissioning planning between now and permanent cessation of operations, instead of three percent of the generic amount specified in 10 CFR 50.75. A portion of the funds will be used for pre-planning activities associated with spent fuel management and site restoration.

In accordance with 10 CFR 50.82(a)(8)(v), decommissioning funding assurance will be reviewed and reported to the NRC annually until residual radioactivity has been reduced to a level that permits termination of the 10 CFR 50 licenses. The latest SSDCE adjusted for inflation, in accordance with applicable regulatory requirements, will be used to demonstrate funding assurance. In addition, actual radiological and spent fuel management expenses will be included in the annual report in accordance with applicable regulatory requirements. If the funding assurance demonstration shows the NDT is not sufficient, then an alternate funding mechanism allowed by 10 CFR 50.75(e) and the guidance provided in Regulatory Guide 1.159 (Reference 10) will be put in place.

As shown in Reference 1, PG&E is projected to be adequately funded to perform radiological decommissioning as outlined in the SSDCE.

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**Table 5-1: Diablo Canyon Power Plant Unit 1 Decommissioning Cash Flow<sup>1</sup>  
(Estimated in Nominal/2022 Dollars)**

Year	Beginning of Year Trust Balance	License Termination	Site Restoration	Spent Fuel Management	Total Cost (Withdrawal)	Earnings <sup>(2)</sup>	End of Year Trust Balance
2010		\$7,445			\$7,445		
2011		\$55,564			\$55,564		
2016		\$245,827			\$245,827		
2017		\$3,375,033			\$3,375,033		
2018		\$10,043,162	\$67,287	\$244,115	\$10,354,563		
2019		\$2,175,207	\$954,087	\$963,249	\$4,092,543		
2020		\$4,525,534	\$936,899	\$476,469	\$5,938,901		
2021		\$5,588,431	\$1,167,364	\$1,142,647	\$7,898,443		\$1,672,303,789 <sup>(3)</sup>
2022	\$1,672,303,789	\$12,979,831	\$2,175,971	\$30,570,965	\$45,726,768	\$23,724,602	\$1,650,301,623
2023	\$1,650,301,623	\$15,639,923	\$4,266,055	\$29,619,812	\$49,525,791	\$23,348,276	\$1,624,124,108
2024	\$1,624,124,108	\$35,104,065	\$6,284,004	\$28,570,289	\$69,958,357	\$22,668,440	\$1,576,834,191
2025	\$1,576,834,191	\$216,255,099	\$5,067,676	\$3,980,311	\$225,303,087	\$19,712,892	\$1,371,243,996
2026	\$1,371,243,996	\$217,035,926	\$10,487,081	\$8,466,046	\$235,989,053	\$16,558,374	\$1,151,813,318
2027	\$1,151,813,318	\$191,729,359	\$12,084,712	\$42,029,723	\$245,843,794	\$13,214,109	\$919,183,633
2028	\$919,183,633	\$180,649,635	\$8,670,128	\$11,562,525	\$200,882,288	\$10,476,856	\$728,778,201
2029	\$728,778,201	\$129,061,645	\$37,518,181	\$4,633,380	\$171,213,206	\$8,132,420	\$565,697,415
2030	\$565,697,415	\$58,499,792	\$64,891,484	\$5,760,107	\$129,151,382	\$6,367,286	\$442,913,318
2031	\$442,913,318	\$48,917,410	\$52,224,234	\$4,701,649	\$105,843,294	\$4,916,369	\$341,986,393
2032	\$341,986,393	\$48,307,740	\$49,505,540	\$4,634,909	\$102,448,189	\$3,493,808	\$243,032,012
2033	\$243,032,012	\$44,866,399	\$48,437,622	\$4,869,941	\$98,173,962	\$2,112,842	\$146,970,892
2034	\$146,970,892	\$37,865,093	\$13,831,232	\$5,583,309	\$57,279,635	\$1,308,201	\$90,999,458
2035	\$90,999,458	\$7,278,793	\$923,555	\$8,134,421	\$16,336,769	\$1,089,000	\$75,751,690
2036	\$75,751,690		\$360,185	\$6,850,804	\$7,210,990	\$999,707	\$69,540,408
2037	\$69,540,408		\$360,113	\$6,490,425	\$6,850,538	\$914,369	\$63,604,239
2038	\$63,604,239		\$358,461	\$6,697,021	\$7,055,481	\$824,798	\$57,373,555
2039	\$57,373,555		\$368,628	\$5,896,245	\$6,264,873	\$745,451	\$51,854,132
2040	\$51,854,132			\$7,665,897	\$7,665,897	\$644,512	\$44,832,747
2041	\$44,832,747			\$5,895,543	\$5,895,543	\$567,922	\$39,505,126
2042	\$39,505,126			\$6,468,354	\$6,468,354	\$481,861	\$33,518,633
2043	\$33,518,633			\$5,939,136	\$5,939,136	\$402,264	\$27,981,761
2044	\$27,981,761			\$6,472,563	\$6,472,563	\$313,725	\$21,822,923
2045	\$21,822,923			\$7,111,610	\$7,111,610	\$214,573	\$14,925,887

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Year	Beginning of Year Trust Balance	License Termination	Site Restoration	Spent Fuel Management	Total Cost (Withdrawal)	Earnings <sup>(2)</sup>	End of Year Trust Balance
2046	\$14,925,887			\$6,446,558	\$6,446,558	\$123,676	\$8,603,005
2047	\$8,603,005			\$5,895,543	\$5,895,543	\$39,490	\$2,746,951 <sup>(4)</sup>
2048	\$2,746,951			\$6,516,155	\$6,516,155		
2049				\$5,917,340	\$5,917,340		
2050				\$7,724,769	\$7,724,769		
2051				\$5,895,543	\$5,895,543		
2052				\$6,472,563	\$6,472,563		
2053				\$5,917,340	\$5,917,340		
2054				\$6,490,150	\$6,490,150		
2055				\$7,133,406	\$7,133,406		
2056				\$6,472,563	\$6,472,563		
2057				\$5,895,543	\$5,895,543		
2058				\$6,446,558	\$6,446,558		
2059				\$5,917,340	\$5,917,340		
2060				\$8,216,991	\$8,216,991		
2061				\$6,730,544	\$6,730,544		
2062				\$8,866,549	\$8,866,549		
2063				\$8,758,318	\$8,758,318		
2064				\$9,166,413	\$9,166,413		
2065				\$9,833,740	\$9,833,740		
2066				\$9,147,341	\$9,147,341		
2067				\$16,302,669	\$16,302,669		
2068				\$16,002,097	\$16,002,097		
2069				\$14,465,553	\$14,465,553		
2070				\$8,277,753	\$8,277,753		
2071				\$2,091,757	\$2,091,757		
2072				\$2,095,750	\$2,095,750		
2073				\$1,225,761	\$1,225,761		
2074				\$1,225,761	\$1,225,761		
2075				\$1,284,136	\$1,284,136		
2076				\$58,360	\$58,360		

**\$1,270,206,913    \$320,940,499    \$474,322,329    \$2,065,469,741    \$163,395,823**

**Notes:**

- 1) Cash Flow assumes Department of Energy (DOE) Used Fuel Repository opens in 2031, and pick up begins in 2038.
- 2) Earnings assume a 2% real rate of return and a 27% effective tax rate on earnings.
- 3) Liquidated value of end of year 2021 trust value.
- 4) In 2048 when costs exceed the total projected value of the Unit 1 portion of the NDT, PG&E anticipates the Unit 2 portion to fund all work.

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**Table 5-2: Diablo Canyon Power Plant Unit 2 Decommissioning Cash Flow<sup>1</sup>  
(Estimated Nominal/2022 Dollars)**

Year	Beginning of Year Trust Balance	License Termination	Site Restoration	Spent Fuel Management	Total Cost (Withdrawal)	Earnings <sup>(2)</sup>	End of Year Trust Balance
2010		\$7,445			\$7,445		
2011		\$55,564			\$55,564		
2016		\$245,827			\$245,827		
2017		\$3,375,033			\$3,375,033		
2018		\$10,043,162	\$67,287	\$244,115	\$10,354,563		
2019		\$2,175,207	\$954,087	\$963,249	\$4,092,543		
2020		\$4,525,534	\$936,899	\$476,469	\$5,938,901		
2021		\$5,588,431	\$1,167,364	\$1,142,647	\$7,898,443		\$2,192,108,283 <sup>(3)</sup>
2022	\$2,192,108,283	\$12,979,831	\$2,175,971	\$30,570,965	\$45,726,768	\$31,306,262	\$2,177,687,778
2023	\$2,177,687,778	\$15,905,822	\$4,266,055	\$29,619,812	\$49,791,689	\$31,036,641	\$2,158,932,730
2024	\$2,158,932,730	\$29,437,907	\$6,284,004	\$28,570,289	\$64,292,199	\$30,551,589	\$2,125,192,119
2025	\$2,125,192,119	\$149,219,248	\$5,067,676	\$2,617,021	\$156,903,945	\$28,708,664	\$1,996,996,838
2026	\$1,996,996,838	\$198,648,623	\$9,483,517	\$4,680,662	\$212,812,803	\$26,023,395	\$1,810,207,430
2027	\$1,810,207,430	\$145,133,340	\$12,031,796	\$8,044,014	\$165,209,150	\$23,993,287	\$1,668,991,568
2028	\$1,668,991,568	\$193,412,139	\$8,625,709	\$40,762,967	\$242,800,815	\$20,801,848	\$1,446,992,601
2029	\$1,446,992,601	\$164,911,528	\$38,087,532	\$7,761,279	\$210,760,339	\$18,031,189	\$1,254,263,451
2030	\$1,254,263,451	\$57,405,694	\$71,261,180	\$5,633,533	\$134,300,407	\$16,335,333	\$1,136,298,377
2031	\$1,136,298,377	\$49,889,020	\$59,103,793	\$4,524,447	\$113,517,260	\$14,917,876	\$1,037,698,994
2032	\$1,037,698,994	\$48,881,891	\$61,924,326	\$4,508,336	\$115,314,552	\$13,453,531	\$935,837,972
2033	\$935,837,972	\$45,349,171	\$56,336,937	\$4,833,910	\$106,520,018	\$12,096,100	\$841,414,054
2034	\$841,414,054	\$37,865,093	\$13,831,232	\$5,565,469	\$57,261,795	\$11,437,331	\$795,589,590
2035	\$795,589,590	\$7,278,793	\$923,555	\$8,173,608	\$16,375,956	\$11,365,298	\$790,578,932
2036	\$790,578,932		\$360,185	\$6,880,375	\$7,240,560	\$11,425,460	\$794,763,832
2037	\$794,763,832		\$360,113	\$6,496,619	\$6,856,732	\$11,492,098	\$799,399,198
2038	\$799,399,198		\$358,461	\$6,151,057	\$6,509,518	\$11,564,772	\$804,454,452
2039	\$804,454,452		\$368,628	\$6,451,866	\$6,820,494	\$11,633,970	\$809,267,927
2040	\$809,267,927			\$7,119,466	\$7,119,466	\$11,699,817	\$813,848,278
2041	\$813,848,278			\$6,451,142	\$6,451,142	\$11,776,372	\$819,173,508
2042	\$819,173,508			\$5,921,946	\$5,921,946	\$11,861,762	\$825,113,324
2043	\$825,113,324			\$6,494,780	\$6,494,780	\$11,940,043	\$830,558,587
2044	\$830,558,587			\$5,926,155	\$5,926,155	\$12,027,759	\$836,660,191
2045	\$836,660,191			\$7,667,208	\$7,667,208	\$12,091,360	\$841,084,343
2046	\$841,084,343			\$5,900,127	\$5,900,127	\$12,181,663	\$847,365,879



**Diablo Canyon Power Plant  
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Year	Beginning of Year Trust Balance	License Termination	Site Restoration	Spent Fuel Management	Total Cost (Withdrawal)	Earnings <sup>(2)</sup>	End of Year Trust Balance
2047	\$847,365,879			\$6,451,142	\$6,451,142	\$12,265,246	\$853,179,983
2048	\$853,179,983			\$5,969,793	\$5,969,793	\$12,302,093	\$855,743,079 <sup>(4)</sup>
2049	\$855,743,079			\$6,472,961	\$6,472,961	\$12,300,806	\$855,653,585
2050	\$855,653,585			\$7,178,361	\$7,178,361	\$12,262,850	\$853,013,305
2051	\$853,013,305			\$6,451,142	\$6,451,142	\$12,261,627	\$852,928,247
2052	\$852,928,247			\$5,926,155	\$5,926,155	\$12,259,627	\$852,789,157
2053	\$852,789,157			\$6,472,961	\$6,472,961	\$12,257,722	\$852,656,578
2054	\$852,656,578			\$5,943,765	\$5,943,765	\$12,255,152	\$852,477,815
2055	\$852,477,815			\$7,561,901	\$7,561,901	\$12,219,561	\$850,002,068
2056	\$850,002,068			\$5,926,155	\$5,926,155	\$12,216,947	\$849,820,298
2057	\$849,820,298			\$6,578,267	\$6,578,267	\$12,213,201	\$849,559,688
2058	\$849,559,688			\$5,900,127	\$5,900,127	\$12,211,254	\$849,424,257
2059	\$849,424,257			\$6,472,961	\$6,472,961	\$12,208,642	\$849,242,600
2060	\$849,242,600			\$7,670,583	\$7,670,583	\$12,154,983	\$845,510,009
2061	\$845,510,009			\$7,286,165	\$7,286,165	\$12,127,829	\$843,621,129
2062	\$843,621,129			\$8,320,118	\$8,320,118	\$12,054,043	\$838,488,505
2063	\$838,488,505			\$9,313,916	\$9,313,916	\$11,966,264	\$832,382,534
2064	\$832,382,534			\$8,692,913	\$8,692,913	\$11,880,310	\$826,403,517
2065	\$826,403,517			\$10,315,544	\$10,315,544	\$11,759,702	\$818,013,934
2066	\$818,013,934			\$10,020,361	\$10,020,361	\$11,651,652	\$810,497,884
2067	\$810,497,884			\$21,650,082	\$21,650,082	\$11,268,034	\$783,813,167
2068	\$783,813,167			\$19,292,793	\$19,292,793	\$10,917,588	\$759,435,864
2069	\$759,435,864			\$14,465,553	\$14,465,553	\$10,654,850	\$741,159,609
2070	\$741,159,609			\$8,277,753	\$8,277,753	\$10,568,786	\$735,172,890
2071	\$735,172,890			\$2,091,757	\$2,091,757	\$10,661,919	\$741,651,295
2072	\$741,651,295			\$2,095,750	\$2,095,750	\$10,756,294	\$748,216,089
2073	\$748,216,089			\$1,225,761	\$1,225,761	\$10,877,424	\$756,641,991
2074	\$756,641,991			\$1,225,761	\$1,225,761	\$11,000,321	\$765,190,790
2075	\$765,190,790			\$1,284,136	\$1,284,136	\$11,123,307	\$773,745,825
2076	\$773,745,825			\$58,360	\$58,360	\$11,283,845	\$784,912,950
		<b>\$1,182,334,301</b>	<b>\$353,976,307</b>	<b>\$476,746,528</b>	<b>\$2,013,057,137</b>	<b>\$771,695,294</b>	

Notes:

- 1) Cash Flow assumes Department of Energy (DOE) Used Fuel Repository opens in 2031, and pick up begins in 2038.
- 2) Earnings assume a 2% real rate of return and a 27% effective tax rate on earnings.
- 3) Liquidated value of end of year 2021 trust value.
- 4) In 2048 when costs exceed the total projected value of the Unit 1 portion of the NDT, PG&E anticipates the Unit 2 portion to fund all work.



**Diablo Canyon Power Plant  
Site-Specific Decommissioning Cost Estimate, Revision 1**

## **6. Conclusion**

The DCPD SSDCE complies with NRC requirements set forth in 10 CFR 50.82, "Termination of license," paragraphs (a)(4)(i), and (a)(8)(iii). PG&E prepared this cost estimate and schedule using several sources, including the updated DCE included in the 2021 NDCTP submitted to the CPUC on December 14, 2021, (Reference 12) which utilized expertise from PG&E's full-scale decommissioning at HBPP Unit 3, industry experts, and benchmarking.

The estimate is based on regulatory requirements, site conditions, baseline assumptions, low-level radioactive waste disposal standards, high-level radioactive waste management options, and site restoration requirements. The cost to decommission the DCPD site, safeguard the SNF and GTCC waste until it can be transferred to the DOE, and restore the affected area of the site is estimated to be \$4.08 billion (2022 dollars). The majority of this cost is associated with license termination. A significant amount of the remaining cost is associated with SNF management since the fuel and GTCC waste will be removed from the SFP and remain in storage at the ISFSI/GTCC Waste Storage Facility until possession is transferred to DOE. A relatively small amount of the decommissioning cost is for the demolition of uncontaminated structures and restoration of the site. The summary of the costs estimated for license termination, spent fuel management, and site restoration activities are presented in Table ES-1.

The largest contributors to the overall decommissioning costs are removal of contaminated components and buildings, disposal costs, and program management costs. 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. The disposal of low-level radioactive waste that is generated from dismantling activities makes up the bulk of the disposal cost category. The magnitude of the program management costs is a function of both the size of the organization needed to manage the decommissioning, as well as the duration.

In accordance with 10 CFR 50.82(a)(8)(v), decommissioning funding assurance will be reviewed and reported to the NRC annually until residual radioactivity has been reduced to a level that permits termination of the licenses. The SSDCE adjusted for inflation, in accordance with applicable regulatory requirements, will be used to demonstrate funding assurance. In addition, actual radiological and spent fuel management expenses will be included in the annual report in accordance with applicable regulatory requirements.

If the funding assurance demonstration shows that the NDT is not sufficient, then an alternate funding mechanism allowed by 10 CFR 50.75(e) and the guidance provided in Regulatory Guide 1.159 (Reference 10) will be put in place.

**Diablo Canyon Power Plant  
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## **7. References**

1. PG&E Letter DCL-22-023, "Decommissioning Funding Report for Diablo Canyon Power Plant, Units 1 and 2," dated March 30, 2022 (ADAMS Accession No. ML22089A150).
2. PG&E Letter DCL-18-096, "Certification of Permanent Cessation of Power Operations," dated November 27, 2018 (ADAMS Accession No. ML18331A553).
3. Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," dated February 2005 (ADAMS Accession No. ML050230008).
4. NUREG-1713, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors," dated December 2004 (ADAMS Accession No. ML043510113).
5. NUREG-0586, Supplement 1, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," dated November 2002 (ADAMS Accession No. ML023470304 and ML023470323).
6. EPRI Report No. 1011734, "Maine Yankee Decommissioning Experience Report (1997 – 2004)," 2005. Publicly accessible at: [www.epri.com](http://www.epri.com)
7. EPRI Report No. 1003025, "Decommissioning Pre-Planning Manual," 2001. Publicly accessible at: [www.epri.com](http://www.epri.com)
8. NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," Revision 1, dated August 2000 (ADAMS Accession No. ML003761445).
9. NUREG -1757, "Consolidated Decommissioning Guidance Financial Assurance, Recordkeeping, and Timeliness," Vol. 3, Revision 1, dated February 2012 (ADAMS Accession No. ML12048A683).
10. Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Revision 2, dated October 2011 (ADAMS Accession No. ML112160012)
11. NRC Letter, "Diablo Canyon Nuclear Power Plant, Units 1 and 2- Exemptions from the Requirements of 10 CFR Part 50, Sections 50.82(a)(8)(i)(A) and 50.82(a)(8)(ii) (EPID L-2018-LLE-0023)," dated September 10, 2019 (ADAMS Accession No. ML19163A104).

**Diablo Canyon Power Plant  
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12. Pacific Gas and Electric Company, 2021 Nuclear Decommissioning Cost Triennial Proceeding, Prepared Testimony, Volume 2, Chapter 3, Attachment A, Public Versions. Accessed:  
<https://pgera.azurewebsites.net/Regulation/search>  
(Search Case: "Nuclear Decom Cost Tri 2021 [A.21-12-007]").
13. PG&E Letter DCL-19-082, Diablo Canyon Power Plant, Units 1 and 2 – Site-Specific Decommissioning Cost Estimate, dated December 4, 2019 (ADAMS Accession No. ML19345D344 and ML19345D345).

ID		Scope Description	A	B	C	D	E	F	G	H	I	J	K	L	M
			Total Estimate Nominal / 2022\$	1-Pre-Shutdown Planning	2-Zirc Fire	3-Wet Storage	4-Building Demolition	5-Part 50 License Termination	6-ISFSI Operations	7-SNF and GTCC Storage Demolition and Restoration	License Termination	Spent Fuel Management	Site Restoration	Utility Hours	Contractor Hours
				11/2010 - 10/2024	11/2024 - 02/2027	03/2027 - 11/2028	12/2028 - 12/2032	01/2033 - 04/2035	05/2035 - 08/2067	09/2067 - 01/2076					
Unassigned Costs															
1		Decommissioning Program Oversight	\$ 362,704	\$ 98,776	\$ 58,334	\$ 44,716	\$ 91,511	\$ 40,342	\$ 21,334	\$ 7,692	\$ 286,336	\$ 37,126	\$ 39,242	2,011,819	20,537
1.01		Decommissioning Program Oversight	\$ 362,704	\$ 98,776	\$ 58,334	\$ 44,716	\$ 91,511	\$ 40,342	\$ 21,334	\$ 7,692	\$ 286,336	\$ 37,126	\$ 39,242	2,011,819	20,537
2		Site Costs	\$ 1,432,030	\$ 57,625	\$ 258,678	\$ 224,439	\$ 329,049	\$ 141,520	\$ 389,394	\$ 31,324	\$ 879,994	\$ 518,889	\$ 33,146	6,135,045	2,180,009
2.01		Site Staffing	\$ 210,579	\$ 6,498	\$ 60,950	\$ 51,983	\$ 61,823	\$ 20,591	\$ 8,729	\$ 5	\$ 186,812	\$ 16,865	\$ 6,902	1,771,155	-
2.02		Security Staffing	\$ 441,601	\$ -	\$ 96,340	\$ 90,926	\$ 32,460	\$ 14,894	\$ 206,944	\$ 38	\$ 173,977	\$ 267,624	\$ -	4,343,760	-
2.03		Other Security Related Costs	\$ 21,200	\$ -	\$ 1,399	\$ 1,836	\$ 4,985	\$ 2,511	\$ 10,468	\$ -	\$ 8,681	\$ 12,519	\$ -	-	44,711
2.04		Energy	\$ 59,448	\$ -	\$ 12,818	\$ 13,680	\$ 12,944	\$ 7,223	\$ 12,783	\$ -	\$ 46,644	\$ 12,804	\$ -	-	-
2.05		NRC Fees / Reviews	\$ 41,273	\$ 14,610	\$ 4,332	\$ 1,899	\$ 4,377	\$ 2,473	\$ 11,177	\$ 2,404	\$ 27,658	\$ 13,615	\$ -	-	86,458
2.06		Association/Industry Fees	\$ 9,718	\$ 326	\$ 2,765	\$ 3,052	\$ 2,297	\$ 1,718	\$ -	\$ -	\$ 9,718	\$ -	\$ -	-	-
2.07		Facility Maintenance	\$ 52,627	\$ -	\$ 10,054	\$ 7,304	\$ 10,765	\$ 4,716	\$ 17,500	\$ 2,287	\$ 29,512	\$ 23,116	\$ -	-	194,487
2.08		Water Management	\$ 49,835	\$ -	\$ 7,917	\$ 8,138	\$ 25,162	\$ 8,618	\$ -	\$ -	\$ 49,835	\$ -	\$ -	-	54,888
2.09		Permits	\$ 66,238	\$ 22,809	\$ 3,762	\$ 3,042	\$ 17,958	\$ 3,960	\$ 13,714	\$ 995	\$ 26,468	\$ 19,252	\$ 20,519	-	139,131
2.10		Future Land Use	\$ 5,726	\$ 4,889	\$ 837	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,726	-	35,021
2.11		Spent Fuel Management	\$ 88,360	\$ 3,701	\$ 1,694	\$ 1,448	\$ 5,644	\$ 6,197	\$ 67,824	\$ 1,852	\$ -	\$ 88,360	\$ -	-	220,511
2.12		License Termination Plan	\$ 23,441	\$ -	\$ 2,784	\$ 3,412	\$ 9,187	\$ 3,413	\$ 3,518	\$ 1,127	\$ 18,796	\$ 4,645	\$ -	-	120,814
2.13		Emergency Planning - Senate Bill 1090	\$ 33,145	\$ -	\$ -	\$ 6,141	\$ 17,352	\$ 9,653	\$ -	\$ -	\$ 33,145	\$ -	\$ -	-	-
2.14		Emergency Planning	\$ 28,115	\$ -	\$ 17,419	\$ 6,581	\$ 1,845	\$ 1,163	\$ 1,107	\$ -	\$ 28,115	\$ -	\$ -	20,130	-
2.15		Consumables	\$ 30,734	\$ -	\$ 3,211	\$ 3,706	\$ 7,713	\$ 3,541	\$ 12,021	\$ 542	\$ 17,688	\$ 13,047	\$ -	-	4,275
2.16		Public Outreach & Stakeholder Engagement	\$ 5,901	\$ 1,937	\$ 881	\$ 667	\$ 1,552	\$ 863	\$ -	\$ -	\$ 5,901	\$ -	\$ -	-	-
2.17		Waste & Transportation Management	\$ 156,618	\$ 2,400	\$ 15,335	\$ 11,704	\$ 72,421	\$ 41,819	\$ 1,602	\$ 11,337	\$ 143,679	\$ 12,939	\$ -	-	840,904
2.18		Transportation	\$ 79,028	\$ -	\$ 545	\$ 415	\$ 58,879	\$ 17,440	\$ -	\$ 1,750	\$ 77,279	\$ 1,750	\$ -	-	-
2.19		Disposal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
2.20		Material Management	\$ 58,458	\$ 457	\$ 22,963	\$ 10,863	\$ 17,119	\$ 2,779	\$ 155	\$ 4,123	\$ 54,180	\$ 4,278	\$ -	-	316,913
2.21		Asset Recovery	\$ (58,093)	\$ -	\$ (7,330)	\$ (2,362)	\$ (36,065)	\$ (12,337)	\$ -	\$ -	\$ (58,093)	\$ -	\$ -	-	-
2.22		SNF & GTCC Transfer to DOE	\$ 28,075	\$ -	\$ -	\$ 3	\$ 631	\$ 725	\$ 21,852	\$ 4,865	\$ -	\$ 28,075	\$ -	-	121,895
3		Administration & General	\$ 283,937	\$ 5,894	\$ 144,477	\$ 5,871	\$ 38,161	\$ 19,478	\$ 55,724	\$ 14,333	\$ 214,352	\$ 68,081	\$ 1,503	176,680	-
3.01		A&G Staffing	\$ 23,098	\$ 5,894	\$ 3,555	\$ 3,100	\$ 7,094	\$ 2,876	\$ 11	\$ 569	\$ 21,015	\$ 580	\$ 1,503	176,680	-
3.02		Severance	\$ 176,232	\$ -	\$ 126,678	\$ -	\$ 25,209	\$ 13,265	\$ 9,347	\$ 1,732	\$ 167,207	\$ 9,025	\$ -	-	-
3.03		Insurance	\$ 39,023	\$ -	\$ 1,184	\$ 1,879	\$ 1,232	\$ 17,121	\$ 2,163	\$ 4,443	\$ 17,430	\$ 21,593	\$ -	-	-
3.04		Property Tax	\$ 45,585	\$ -	\$ 1,364	\$ 1,587	\$ 3,694	\$ 2,105	\$ 29,245	\$ 7,589	\$ 8,701	\$ 36,884	\$ -	-	-
Discrete Costs															
4		Decommissioning Preparations	\$ 38,509	\$ 7,851	\$ 26,103	\$ 4,555	\$ -	\$ -	\$ -	\$ -	\$ 38,509	\$ -	\$ -	-	187,883
4.01		U1 Spent Fuel Pool Island	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
4.02		U2 Spent Fuel Pool Island	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
4.03		Install 230kV Baywood Feed	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
4.04		U1 Cold and Dark	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
4.05		U2 Cold and Dark	\$ 17,747	\$ 5,311	\$ 11,761	\$ 674	\$ -	\$ -	\$ -	\$ -	\$ 17,747	\$ -	\$ -	-	105,275
4.06		Security Modifications	\$ 4,072	\$ 739	\$ 1,134	\$ 2,199	\$ -	\$ -	\$ -	\$ -	\$ 4,072	\$ -	\$ -	-	21,810
4.07		Site Characterization	\$ 16,690	\$ 1,801	\$ 13,207	\$ 1,682	\$ -	\$ -	\$ -	\$ -	\$ 16,690	\$ -	\$ -	-	60,798
5		Site Infrastructure	\$ 128,500	\$ 5,884	\$ 66,190	\$ 40,573	\$ 11,395	\$ 4,458	\$ -	\$ -	\$ 128,500	\$ -	\$ -	-	674,956
5.01		Offsite Infrastructure	\$ 2,464	\$ 963	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,464	\$ -	\$ -	-	13,331
5.02		Road Improvements	\$ 15,586	\$ -	\$ 7,642	\$ 5,879	\$ 1,542	\$ 522	\$ -	\$ -	\$ 15,586	\$ -	\$ -	-	70,590
5.03		Facility Construction	\$ 22,971	\$ 203	\$ 5,809	\$ 16,958	\$ -	\$ -	\$ -	\$ -	\$ 22,971	\$ -	\$ -	-	113,188
5.04		Existing Building and Structure Modifications	\$ 37,533	\$ -	\$ 16,513	\$ 14,500	\$ 3,461	\$ 3,059	\$ -	\$ -	\$ 37,533	\$ -	\$ -	-	163,439
5.05		ISFSI Security Building Construction	\$ 17,962	\$ 1,844	\$ 15,680	\$ 438	\$ -	\$ -	\$ -	\$ -	\$ 17,962	\$ -	\$ -	-	83,555
5.06		ISFSI Pad Expansion for GTCC Storage	\$ 18,567	\$ 2,278	\$ 16,289	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,567	\$ -	\$ -	-	121,103
5.07		Project Oversight and Support	\$ 13,417	\$ 595	\$ 2,757	\$ 2,798	\$ 6,391	\$ 877	\$ -	\$ -	\$ 13,417	\$ -	\$ -	-	109,751
6		Large Component Removal	\$ 167,563	\$ 4,387	\$ 158,865	\$ 3,200	\$ 1,110	\$ -	\$ -	\$ -	\$ 167,563	\$ -	\$ -	-	329,879
6.01		Legacy Steam Generators	\$ 34,369	\$ 1,395	\$ 32,975	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 34,369	\$ -	\$ -	-	46,318
6.02		Legacy Rx Heads	\$ 3,611	\$ -	\$ 3,611	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,611	\$ -	\$ -	-	10,096
6.03		Steam Generators	\$ 88,116	\$ -	\$ 88,116	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 88,116	\$ -	\$ -	-	160,484
6.04		Reactor Heads	\$ 5,218	\$ -	\$ 5,218	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,218	\$ -	\$ -	-	4,965
6.05		Reactor Coolant Pumps	\$ 10,194	\$ -	\$ 10,194	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,194	\$ -	\$ -	-	16,825
6.06		Pressurizers	\$ 4,751	\$ -	\$ 4,751	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,751	\$ -	\$ -	-	4,690
6.07		Manipulators	\$ 1,272	\$ -	\$ 1,272	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,272	\$ -	\$ -	-	1,874
6.08		Generators and Exciters	\$ 662	\$ -	\$ 662	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 662	\$ -	\$ -	-	3,711
6.09		Main Turbines	\$ 1,808	\$ -	\$ 1,808	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,808	\$ -	\$ -	-	10,420
6.10		Diesel Generators	\$ 798	\$ -	\$ -	\$ 52	\$ 746	\$ -	\$ -	\$ -	\$ 798	\$ -	\$ -	-	3,086
6.11		Other Turbine Building Components	\$ 5,912	\$ -	\$ 5,459	\$ 453	\$ -	\$ -	\$ -	\$ -	\$ 5,912	\$ -	\$ -	-	26,410
6.12		Large Access Penetrations	\$ 361	\$ -	\$ 361	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 361	\$ -	\$ -	-	675

		A	B	C	D	E	F	G	H	I	J	K	L	M
ID	Scope Description	Total Estimate Nominal / 2022\$	1-Pre-Shutdown Planning	2-Zirc Fire	3-Wet Storage	4-Building Demolition	5-Part 50 License Termination	6-ISFSI Operations	7-SNF and GTCC Stoage Demolition and Restoration	License Termination	Spent Fuel Manaaement	Site Restoration	Utility Hours	Contractor Hours
6.13	Project Oversight and Support	\$ 10,491	\$ 2,993	\$ 4,439	\$ 2,695	\$ 364	\$ -	\$ -	\$ -	\$ 10,491	\$ -	\$ -	-	40,325
7	Reactor/Internals Segmentation	\$ 403,982	\$ 2,311	\$ 56,736	\$ 225,956	\$ 118,979	\$ -	\$ -	\$ -	\$ 403,982	\$ -	\$ -	-	513,603
7.01	U1 Internals Segmentation	\$ 17,136	\$ -	\$ 5,174	\$ 11,962	\$ -	\$ -	\$ -	\$ -	\$ 17,136	\$ -	\$ -	-	59,857
7.02	U1 Reactor Segmentation	\$ 11,782	\$ -	\$ 404	\$ 7,280	\$ 4,098	\$ -	\$ -	\$ -	\$ 11,782	\$ -	\$ -	-	35,070
7.03	U2 Internals Segmentation	\$ 16,388	\$ -	\$ -	\$ 16,363	\$ 25	\$ -	\$ -	\$ -	\$ 16,388	\$ -	\$ -	-	51,480
7.04	U2 Reactor Segmentation	\$ 10,614	\$ -	\$ -	\$ 2,188	\$ 8,425	\$ -	\$ -	\$ -	\$ 10,614	\$ -	\$ -	-	34,990
7.05	Waste & Transportation	\$ 253,107	\$ -	\$ 2,099	\$ 153,023	\$ 97,985	\$ -	\$ -	\$ -	\$ 253,107	\$ -	\$ -	-	3,969
7.06	Project Oversight and Support	\$ 38,700	\$ 2,311	\$ 11,436	\$ 16,865	\$ 8,088	\$ -	\$ -	\$ -	\$ 38,700	\$ -	\$ -	-	195,284
7.07	Specialty Equipment	\$ 56,256	\$ -	\$ 37,624	\$ 18,275	\$ 357	\$ -	\$ -	\$ -	\$ 56,256	\$ -	\$ -	-	132,952
8	SNF & GTCC Transfer to Onsite Storage	\$ 264,756	\$ 165,073	\$ 15,930	\$ 77,779	\$ 5,974	\$ -	\$ -	\$ -	\$ -	\$ 264,756	\$ -	-	434,422
8.01	SNF and GTCC Cask Procurement	\$ 203,920	\$ 165,073	\$ 11,479	\$ 26,716	\$ 654	\$ -	\$ -	\$ -	\$ -	\$ 203,920	\$ -	-	37,524
8.02	U1 Spent Fuel transfer to ISFSI	\$ 31,588	\$ -	\$ 4,219	\$ 26,939	\$ 430	\$ -	\$ -	\$ -	\$ -	\$ 31,588	\$ -	-	201,117
8.03	U2 Spent Fuel transfer to ISFSI	\$ 24,059	\$ -	\$ 233	\$ 23,460	\$ 366	\$ -	\$ -	\$ -	\$ -	\$ 24,059	\$ -	-	159,676
8.04	U1 GTCC Transfer to ISFSI	\$ 2,776	\$ -	\$ -	\$ 665	\$ 2,111	\$ -	\$ -	\$ -	\$ -	\$ 2,776	\$ -	-	17,463
8.05	U2 GTCC Transfer to ISFSI	\$ 2,412	\$ -	\$ -	\$ -	\$ 2,412	\$ -	\$ -	\$ -	\$ -	\$ 2,412	\$ -	-	18,641
9	Turbine Building	\$ 100,980	\$ 1,127	\$ 25,711	\$ 36,333	\$ 32,476	\$ 5,332	\$ -	\$ -	\$ 62,767	\$ -	\$ 38,213	-	422,291
9.01	U1 Decontamination	\$ 23,337	\$ 719	\$ 6,984	\$ 14,467	\$ 1,090	\$ 78	\$ -	\$ -	\$ 23,337	\$ -	\$ -	-	132,520
9.02	U1 System & Area Closure	\$ 8,331	\$ 361	\$ 7,177	\$ 105	\$ 681	\$ 7	\$ -	\$ -	\$ 8,331	\$ -	\$ -	-	39,523
9.03	U1 Demolition	\$ 18,475	\$ -	\$ 1,518	\$ 894	\$ 13,480	\$ 2,583	\$ -	\$ -	\$ -	\$ -	\$ 18,475	-	34,794
9.04	U2 Decontamination	\$ 19,162	\$ 47	\$ 3,255	\$ 14,180	\$ 1,602	\$ 78	\$ -	\$ -	\$ 19,162	\$ -	\$ -	-	108,061
9.05	U2 System & Area Closure	\$ 11,937	\$ -	\$ 4,903	\$ 5,550	\$ 1,476	\$ 8	\$ -	\$ -	\$ 11,937	\$ -	\$ -	-	63,523
9.06	U2 Demolition	\$ 19,738	\$ -	\$ 1,874	\$ 1,137	\$ 14,147	\$ 2,579	\$ -	\$ -	\$ -	\$ -	\$ 19,738	-	43,868
10	Auxiliary Building	\$ 200,148	\$ 338	\$ 24,173	\$ 41,778	\$ 113,896	\$ 19,962	\$ -	\$ -	\$ 85,952	\$ -	\$ 114,196	-	649,526
10.01	U1 Decontamination	\$ 5,508	\$ -	\$ 1,316	\$ 544	\$ 3,340	\$ 308	\$ -	\$ -	\$ 5,508	\$ -	\$ -	-	25,491
10.02	U1 System & Area Closure	\$ 39,119	\$ 338	\$ 11,379	\$ 18,204	\$ 8,928	\$ 270	\$ -	\$ -	\$ 39,119	\$ -	\$ -	-	241,582
10.03	U1 Demolition	\$ 41,176	\$ -	\$ 969	\$ 1,573	\$ 33,312	\$ 5,323	\$ -	\$ -	\$ -	\$ -	\$ 41,176	-	76,580
10.04	U2 Decontamination	\$ 5,845	\$ -	\$ 1,287	\$ 451	\$ 3,314	\$ 793	\$ -	\$ -	\$ 5,845	\$ -	\$ -	-	13,540
10.05	U2 System & Area Closure	\$ 35,480	\$ -	\$ 8,273	\$ 19,468	\$ 7,472	\$ 267	\$ -	\$ -	\$ 35,480	\$ -	\$ -	-	219,860
10.06	U2 Demolition	\$ 73,019	\$ -	\$ 948	\$ 1,539	\$ 57,532	\$ 13,001	\$ -	\$ -	\$ -	\$ -	\$ 73,019	-	72,473
11	Containment Building	\$ 315,913	\$ 1,502	\$ 63,930	\$ 18,443	\$ 191,341	\$ 40,697	\$ -	\$ -	\$ 98,408	\$ -	\$ 217,505	-	763,663
11.01	U1 Decontamination	\$ 10,680	\$ 815	\$ 5,259	\$ 281	\$ 4,234	\$ 91	\$ -	\$ -	\$ 10,680	\$ -	\$ -	-	56,904
11.02	U1 System & Area Closure	\$ 39,775	\$ 544	\$ 25,230	\$ 7,974	\$ 5,426	\$ 601	\$ -	\$ -	\$ 39,775	\$ -	\$ -	-	231,967
11.03	U1 Demolition	\$ 107,967	\$ -	\$ 1,102	\$ 1,788	\$ 85,534	\$ 19,544	\$ -	\$ -	\$ -	\$ -	\$ 107,967	-	98,137
11.04	U2 Decontamination	\$ 7,617	\$ 144	\$ 4,225	\$ 12	\$ 3,145	\$ 91	\$ -	\$ -	\$ 7,617	\$ -	\$ -	-	36,444
11.05	U2 System & Area Closure	\$ 40,337	\$ -	\$ 27,078	\$ 6,707	\$ 5,950	\$ 601	\$ -	\$ -	\$ 40,337	\$ -	\$ -	-	238,434
11.06	U2 Demolition	\$ 109,538	\$ -	\$ 1,036	\$ 1,681	\$ 87,052	\$ 19,769	\$ -	\$ -	\$ -	\$ -	\$ 109,538	-	101,777
12	Fuel Handling Building	\$ 42,605	\$ -	\$ -	\$ -	\$ 42,450	\$ 155	\$ -	\$ -	\$ 42,605	\$ -	\$ -	-	257,598
12.01	U1 Decontamination	\$ 2,536	\$ -	\$ -	\$ -	\$ 2,476	\$ 60	\$ -	\$ -	\$ 2,536	\$ -	\$ -	-	12,285
12.02	U1 System & Area Closure	\$ 16,448	\$ -	\$ -	\$ -	\$ 16,430	\$ 18	\$ -	\$ -	\$ 16,448	\$ -	\$ -	-	102,132
12.03	U1 Demolition	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
12.04	U2 Decontamination	\$ 2,426	\$ -	\$ -	\$ -	\$ 2,366	\$ 60	\$ -	\$ -	\$ 2,426	\$ -	\$ -	-	11,475
12.05	U2 System & Area Closure	\$ 21,195	\$ -	\$ -	\$ -	\$ 21,177	\$ 18	\$ -	\$ -	\$ 21,195	\$ -	\$ -	-	131,707
12.06	U2 Demolition	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
14	Balance of Site	\$ 90,193	\$ 3,827	\$ 11,212	\$ 13,666	\$ 44,405	\$ 17,082	\$ -	\$ -	\$ 26,207	\$ -	\$ 63,986	-	448,645
14.01	Decontamination	\$ 11,396	\$ 126	\$ 2,158	\$ 2,347	\$ 5,292	\$ 1,472	\$ -	\$ -	\$ 11,396	\$ -	\$ -	-	72,356
14.02	System & Area Closure	\$ 14,811	\$ 1,348	\$ 1,456	\$ 968	\$ 11,032	\$ 8	\$ -	\$ -	\$ 14,811	\$ -	\$ -	-	84,119
14.03	Demolition	\$ 63,986	\$ 2,353	\$ 7,599	\$ 10,351	\$ 28,081	\$ 15,602	\$ -	\$ -	\$ -	\$ -	\$ 63,986	-	292,171
15	Intake Structure	\$ 11,685	\$ -	\$ -	\$ 628	\$ 9,619	\$ 1,438	\$ -	\$ -	\$ 11,685	\$ -	\$ -	-	59,814
15.01	System Area Closure	\$ 11,685	\$ -	\$ -	\$ 628	\$ 9,619	\$ 1,438	\$ -	\$ -	\$ 11,685	\$ -	\$ -	-	59,814
15.02	Coffer Dam	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
15.03	Demolition	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
16	Discharge Structure	\$ 18,768	\$ -	\$ 1,208	\$ 1,070	\$ 16,491	\$ -	\$ -	\$ -	\$ 5,681	\$ -	\$ 13,087	-	87,222
16.01	Discharge Piping Decon	\$ 608	\$ -	\$ -	\$ -	\$ 608	\$ -	\$ -	\$ -	\$ 608	\$ -	\$ -	-	3,540
16.02	Coffer Dam	\$ 8,916	\$ -	\$ 577	\$ -	\$ 8,339	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8,916	-	30,804
16.03	Demolition	\$ 4,171	\$ -	\$ 631	\$ 1,070	\$ 2,470	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,171	-	23,466
16.04	System Area Closure	\$ 5,073	\$ -	\$ -	\$ -	\$ 5,073	\$ -	\$ -	\$ -	\$ 5,073	\$ -	\$ -	-	29,412
18	Non-ISFSI Site Restoration	\$ 154,039	\$ 4,799	\$ 8,507	\$ 8,551	\$ 83,390	\$ 45,085	\$ 3,708	\$ -	\$ -	\$ -	\$ 154,039	-	671,069
18.01	Utilities and Structures Demo	\$ 37,890	\$ -	\$ 341	\$ -	\$ 30,290	\$ 7,259	\$ -	\$ -	\$ -	\$ -	\$ 37,890	-	81,646
18.02	Soil Remediation	\$ 6,791	\$ 410	\$ 484	\$ 444	\$ 3,521	\$ 1,280	\$ 652	\$ -	\$ -	\$ -	\$ 6,791	-	31,441
18.03	Final Site Survey	\$ 45,921	\$ 4,312	\$ 5,109	\$ 6,616	\$ 21,868	\$ 8,016	\$ -	\$ -	\$ -	\$ -	\$ 45,921	-	256,633

ID		A	B	C	D	E	F	G	H	I	J	K	L	M
Scope Description		Total Estimate Nominal / 2022\$	1-Pre-Shutdown Planning	2-Zirc Fire	3-Wet Storage	4-Building Demolition	5-Part 50 License Termination	6-ISFSI Operations	7-SNF and GTCC Stoage Demolition and Restoration	License Termination	Spent Fuel Manaaement	Site Restoration	Utility Hours	Contractor Hours
18.04	Grading and Landscaping	\$ 63,437	\$ 77	\$ 2,573	\$ 1,491	\$ 27,711	\$ 28,529	\$ 3,056	\$ -	\$ -	\$ -	\$ 63,437	-	301,349
20	SNF & GTCC Storage Demolition & Restoration	\$ 62,216	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,712	\$ 56,504	\$ -	\$ 62,216	\$ -	-	301,092
20.01	Utilities and Structures Demo	\$ 36,327	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,000	\$ 33,327	\$ -	\$ 36,327	\$ -	-	175,989
20.02	Soil Remediation	\$ 790	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 790	\$ -	\$ 790	\$ -	-	3,546
20.03	Final Site Survey	\$ 2,115	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,115	\$ -	\$ 2,115	\$ -	-	9,014
20.04	Grading and Landscaping	\$ 22,984	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,712	\$ 20,272	\$ -	\$ 22,984	\$ -	-	112,542
GRAND TOTAL		\$ 4,078,527	\$ 359,393	\$ 920,055	\$ 747,558	\$ 1,130,245	\$ 335,550	\$ 475,872	\$ 109,853	\$ 2,452,541	\$ 951,069	\$ 674,917	8,323,544	8,002,208

Note: 2010-2021 in Nominal Dollars. 2022-2076 in 2022 dollars.

**Pacific Gas and Electric Company**  
**Confidential Financial Information Affidavit**



**Pacific Gas and Electric Company (PG&E) Confidential Financial Information Affidavit**

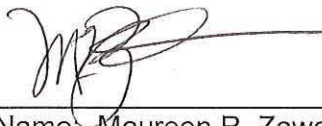
Affidavit of Maureen R. Zawalick Vice President Decommissioning and Technical Services of Pacific Gas and Electric Company.

The site-specific decommissioning cost estimate, contained in Enclosure 1 of this submittal, contains information that PG&E considers confidential. Release of the information could cause competitive harm during contract negotiations for execution of actual decommissioning work.

The basis for this declaration is:

- i. This information is owned and maintained as confidential by PG&E,
- ii. This information has been held in confidence by PG&E. To the extent that PG&E has shared this information with others, it has done so on a confidential basis,
- iii. This information is being requested to be withheld in confidence by the NRC by this petition,
- iv. The information is not available in public sources,
- v. Release of the information could cause competitive harm during contract negotiations for execution of actual decommissioning work.
- vi. The information to be withheld is being transmitted to the NRC in confidence.

I, Maureen R. Zawalick, being duly sworn, state that I am the person who subscribes my name the foregoing statement, I am authorized to execute the Affidavit on behalf of PG&E and that the matters and facts set forth in the statement are true to the best of my knowledge, information and belief.



Name: Maureen R. Zawalick

Title: Vice President Decommissioning and Technical Services

Company: Pacific Gas and Electric Company



**CALIFORNIA ACKNOWLEDGMENT**

**CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

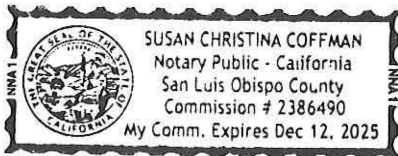
State of California

County of San Luis Obispo }

On October 12, 2022 before me, Susan Christina Coffman, Notary  
Date Here Insert Name and Title of the Officer

personally appeared Maureen R. Zawalick  
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Place Notary Seal and/or Stamp Above

Signature Susan Christina Coffman  
Signature of Notary Public

**OPTIONAL**

Completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

**Description of Attached Document**

Title or Type of Document: PG & E Letter DCL-22-041 Site Specific Decomm

Document Date: October 12, 2022 Number of Pages: 108

Signer(s) Other Than Named Above: \_\_\_\_\_

**Capacity(ies) Claimed by Signer(s)**

Signer's Name: Maureen R. Zawalick

☒ Corporate Officer – Title(s): Vice President

☐ Partner – ☐ Limited ☐ General

☐ Individual ☐ Attorney in Fact

☐ Trustee ☐ Guardian or Conservator

☐ Other: \_\_\_\_\_

Signer is Representing: Pacific Gas and Electric Company

Signer's Name: \_\_\_\_\_

☐ Corporate Officer – Title(s): \_\_\_\_\_

☐ Partner – ☐ Limited ☐ General

☐ Individual ☐ Attorney in Fact

☐ Trustee ☐ Guardian or Conservator

☐ Other: \_\_\_\_\_

Signer is Representing: \_\_\_\_\_

Cost Estimate