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ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED LICENSE AMENDMENT OF  
U.S. NUCLEAR REGULATORY COMMISSION LICENSE NO. SNM-2514 FOR  
PACIFIC GAS AND ELECTRIC COMPANY'S HUMBOLDT BAY  
INDEPENDENT SPENT FUEL STORAGE INSTALLATION  
IN HUMBOLDT COUNTY, CA

**1.0 Introduction**

The U.S. Nuclear Regulatory Commission (NRC) staff has prepared this environmental assessment (EA) of Pacific Gas and Electric Company's (PG&E's or the licensee's) request for amendment to License No. SNM-2514 for the Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI). On September 8, 2010, PG&E submitted a request to the NRC in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 72.56, "Application for amendment of license," to amend its license to allow for the storage of greater than Class C (GTCC)<sup>1</sup> process waste in the Humboldt Bay ISFSI (PG&E, 2010). On April 14, 2011, the NRC staff found PG&E's application to be acceptable for a detailed review (NRC, 2011a.). In response to NRC staff requests for additional information during the NRC staff's detailed review, PG&E provided supplemental information (PG&E, 2011a; 2011b; 2011c; 2012b; 2012c; 2012d; 2013a; 2013b; 2013c).

The Humboldt Bay ISFSI is located on the Humboldt Bay Power Plant (HBPP) site, in Humboldt County, California, approximately 4.8 kilometers (km) (3 miles (mi)) southwest of the city of Eureka, California. NRC issued License No. SNM-2514 to PG&E in November 2005 and subsequently amended the license in August 2008 and August 2009 (NRC, 2005c, 2008, 2009). PG&E is authorized by NRC, under License No. SNM-2514, to receive, possess, transfer, and store spent nuclear fuel, resulting from the operation of the HBPP Unit 3 reactor, and GTCC activated metal waste, resulting from the operation and decommissioning of the HBPP Unit 3 reactor, at the Humboldt Bay ISFSI, for a 20-year term. In October 2005, the NRC staff prepared an EA and considered potential environmental impacts associated with construction, operation, and decommissioning of the Humboldt Bay ISFSI (NRC, 2005b). The NRC staff concluded that the construction, operation, and decommissioning of the Humboldt Bay ISFSI would not result in a significant impact to the environment and published the related Finding of No Significant Impact in the *Federal Register* on November 16, 2005 (70 FR 69605).

PG&E initiated the proposed federal action by submitting an application to amend License No. SNM-2514 to allow GTCC process waste, consisting of miscellaneous solid waste resulting from HBPP Unit 3 operations and from decommissioning, to also be stored at the Humboldt Bay ISFSI. Approval of the license amendment request would allow the licensee to store the GTCC process waste at the Humboldt Bay ISFSI, in the same storage cask that the GTCC activated metal waste will be stored in.

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<sup>1</sup> GTCC waste is low-level radioactive waste generated by the commercial sector that exceeds NRC concentration limits for Class C low-level waste, as specified in 10 CFR Part 61.

The NRC staff prepared this EA in accordance with the NRC regulations listed in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," which implement the National Environmental Policy Act of 1969, as amended (NEPA), and the NRC staff guidance document, NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with Nuclear Material Safety and Safeguards Programs" (NRC, 2003a).

In addition to this EA, the NRC staff is also conducting a detailed safety review of the license amendment request in accordance with NRC regulations in 10 CFR 72.58, "Issuance of amendment." The NRC staff will prepare a separate safety evaluation report to document its review and analysis. The NRC staff's decision whether to amend the Humboldt Bay ISFSI license as proposed will be based on the results of the NRC staff's review as documented in this EA and in the safety evaluation report.

## **2.0 The Proposed Action**

PG&E initiated the proposed federal action by submitting an application to amend NRC License No. SNM-2514 to allow approximately 0.5 cubic feet of solid GTCC process waste to be stored at the Humboldt Bay ISFSI. The GTCC process waste consists of miscellaneous solid waste resulting from HBPP Unit 3 operations and from decommissioning, including debris from spent fuel pool cleanup. If approved, PG&E would be able to store the GTCC process waste at the Humboldt Bay ISFSI in accordance with the requirements in 10 CFR Part 72.

License No. SNM-2514 currently authorizes PG&E to store spent fuel assemblies and GTCC waste, as activated metals comprised of miscellaneous solid waste resulting from reactor operation and decommissioning. The current "chemical and/or physical form" in Condition 7.B. of License No. SNM-2514 only specifies "activated metals." Consequently, the licensee requested an amendment to the license that, if approved, would modify the license condition to add the words "and process wastes" to store the GTCC process waste in the Humboldt Bay ISFSI. PG&E is currently storing approximately 390 spent fuel assemblies in five storage casks and has authorization to store GTCC activated metal waste in the sixth storage cask at the ISFSI.

The term "storage cask" is used in this EA to generally refer to a dry cask storage system that stores radioactive material at an ISFSI. The term "GTCC storage cask" is used in this EA to specifically refer to the dry cask storage system that will be used to store GTCC waste at the Humboldt Bay ISFSI. The GTCC storage cask consists of: (1) a stainless steel cylindrical GTCC Waste Container (GWC) that contains the GTCC waste; and (2) a HI-STAR HB overpack that contains the GWC during transfer and storage. After the GTCC waste is loaded in the GWC, a lid will be placed on top of the GWC and welded shut. The GWC lid weld is designed to ensure that no credible leakage of radioactive materials will occur, and a separate closure ring weld provides a redundant welded boundary to prevent leakage. The GWC is designed to confine the radioactive material during all normal, off-normal, and accident conditions. The HI-STAR HB overpack is a heavy-walled, multilayered, cylindrical vessel constructed of carbon steel, which provides radiation shielding and protects the GWC from missiles and natural phenomena.

The proposed license amendment does not involve any construction activities, land disturbance, excavation, or physical changes to the HBPP facilities, site, or environment. The proposed action involves a change associated with ISFSI operations, by the addition of the GTCC process waste as a material that can be stored in the existing Humboldt Bay ISFSI. Operations

associated with the proposed action include: (1) loading GTCC process wastes (along with GTCC activated metal waste) into the GTCC storage cask, in the HBPP Unit 3 spent fuel pool; (2) transporting the GTCC storage cask from the HBPP Unit 3 spent fuel pool to the ISFSI along an approved transportation route entirely within the HBPP site; and (3) placing and storing the GTCC storage cask in the existing ISFSI until a time when there is a permanent facility that will accept the GTCC waste for disposal.

If the amendment request is approved, the GTCC process waste would be stored in the same GTCC storage cask as the GTCC activated metal waste that is already approved to be stored in the ISFSI. The amendment would involve a minor change in the design of the GWC, in that a section of pipe (called the outer container) is welded to the bottom of the GWC to hold and provide stabilization for the process waste container that contains the process waste. After the process waste container is placed within the outer container, a lid would be placed on the outer container to serve as a barrier to prevent co-mingling with the activated metal components. The amendment would also involve a minor change in the loading operations in the HBPP Unit 3 spent fuel pool, in that the process waste container would need to be placed in the GWC before the activated metal is placed in the cask. The activated metals would then be loaded into the GWC and placed outside the outer container and on the outer container lid.

The remainder of the GTCC storage cask loading operations are nearly identical to those considered in the review of PG&E's original license application for the Humboldt Bay ISFSI (NRC, 2005b).

### **3.0 Purpose and Need for the Proposed Action**

The purpose and need for the proposed action is to provide an option that allows temporary dry storage of GTCC process waste resulting from operation and decommissioning of HBPP Unit 3. PG&E is in the process of decommissioning HBPP Unit 3. As decommissioning activities commenced, it became apparent to PG&E that License No. SNM-2514 would need to be amended to allow storage of the GTCC process waste in the ISFSI, until a permanent facility (or facilities) is available for the offsite disposition of GTCC waste. Removal of GTCC process waste from the HBPP Unit 3 spent fuel pool to the existing ISFSI would permit the dismantling and decommissioning of the existing reactor structures (including the spent fuel pool) of the HBPP Unit 3 facility. This would allow earlier termination of the 10 CFR Part 50 license for HBPP Unit 3 (License No. DPR-7) and release of most areas for unrestricted use.

### **4.0 Consultations**

The National Historic Preservation Act of 1966, as amended (NHPA) was enacted to create a national historic preservation program, including the National Register of Historic Places and the Advisory Council on Historic Preservation (ACHP). Section 106 requires Federal agencies to consider the effects of their undertakings on historic properties. The ACHP regulations implementing Section 106 of the Act are found in 36 CFR Part 800. NRC is coordinating compliance with Section 106 in parallel with the NEPA process.

The Endangered Species Act of 1973 was enacted to prevent the further decline of endangered and threatened species and to restore those species and their critical habitats. Section 7 of this Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) of the U.S. Department of the Interior or the National Marine Fisheries Service of the U.S. Department of Commerce to determine whether endangered and threatened species or their critical habitats

are known to be in the vicinity of the proposed action, and to determine whether the proposed federal action may affect listed species or critical habitat.

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was enacted to provide for the conservation and management of the fisheries. Section 305 of this Act requires Federal Agencies to consult with the Secretary of Commerce before authorizing any action which may adversely affect any essential fish habitat identified under this Act.

With regard to the above laws, NRC staff requested input from the California Office of Historic Preservation, the California Native American Heritage Commission, Federally-recognized Indian Tribes (the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria), the U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration National Marine Fisheries Service. Section 8.0 in this EA provides additional information about the consultations.

## **5.0 Alternatives to the Proposed Action**

As an alternative to the proposed action, staff considered denial of the amendment request (i.e., the “no-action” alternative). Under the no-action alternative, PG&E would continue to store the GTCC process waste under its 10 CFR Part 50 license for HBPP Unit 3, either in the spent fuel pool or in another appropriately shielded configuration. PG&E would not be able to completely decommission the existing Unit 3 radioactive reactor structures and facility, including the spent fuel pool, and therefore would not be able to request termination of the 10 CFR Part 50 license (License No. DPR-7) and release most areas of the site for unrestricted use. PG&E would continue to maintain and monitor the spent fuel pool, the management of solid radioactive wastes, and the monitoring of effluents under the existing 10 CFR Part 50 license. Denial of the amendment request would result in no change to the environmental impacts associated with storage of GTCC process waste at the spent nuclear fuel pool under the 10 CFR Part 50 license.

## **6.0 Affected Environment**

Some aspects of the affected environment are discussed below. Additional details can be found in the original EA supporting Humboldt Bay ISFSI license issuance (NRC, 2005b).

### **6.1 Land Use**

The Humboldt Bay ISFSI site is located on the HBPP site on the northern California coast in Humboldt County, approximately 4.8 km (3 mi) southwest of the city of Eureka. PG&E owns 143 acres of land area along the mainland shore of Humboldt Bay and the intertidal areas extending approximately 150 meters (m) (500 feet (ft)) into Humboldt Bay from this land area. PG&E has full authority to control all activities within its property lines at the HBPP site.

The ISFSI site is located in the vicinity of several ports that support commercial and sport fishing activities, and a public trail to access a breakwater for recreational fishing crosses the controlled area for the ISFSI.

### **6.2 Demography**

The population distribution for areas around the ISFSI site is based on the Year 2010 census. The area within 80.5 km (50 mi) of the ISFSI includes most of Humboldt County and a small

portion of Trinity County. Approximately 50 percent of the area within the radius is on land, with the balance being Humboldt Bay and the Pacific Ocean. In general, the portion of California that lies within 80.5 km (50 mi) of the ISFSI is relatively sparsely populated, with the exception of a few urbanized areas along the coast.

According to the 2010 Census (U.S. Census Bureau, 2013), the population of Humboldt County was 134,623, and the population of Trinity County was 13,786. The nearest population center to the ISFSI site, the City of Eureka, had a population of 27,191 in 2010.

### **6.3 Climatology and Meteorology**

The climate of the greater Humboldt Bay region, including Eureka and the immediate coastal strip where the Humboldt Bay ISFSI is located, is characterized as Mediterranean. The warmest months are from July to September, and the coldest months are from December to February. The rainy season generally falls between November and March. The wind is predominantly from the north to northwest, with a shift to the south to southeast during the winter months.

### **6.4 Hydrology**

The Humboldt Bay ISFSI is located on a relatively flat area on Buhne Point at elevation 13.4 meters (44 ft) mean lower low water (MLLW). Surface drainage around the ISFSI area flows naturally into the existing plant drainage system. By way of the plant drain system, the surface water then discharges into the cooling water intake canal, flows through the plant, and discharges into Humboldt Bay via the cooling water discharge canal. Outside the area served by the plant drainage system, most of the surface runoff drains to the east and into the discharge canal. The remainder drains into Buhne Slough, a natural drainage for the area, which drains directly into both the intake canal and Humboldt Bay.

#### **6.4.1 Surface Water**

Several rivers and creeks drain the region around the HBPP and the ISFSI site, including the Mad River, which flows west approximately 24.1 km (15 mi) northeast of the site, and the Eel River, which discharges into the Pacific Ocean approximately 12.9 km (8 mi) south of the site. Of the four major creeks that drain into Humboldt Bay, Salmon Creek and Elk River are the ones nearest to the site; both within 1.6 km (1 mi) south and north, respectively, of the ISFSI site. Salmon Creek and Elk River are used for watering livestock, but are not used as a potable water supply.

With respect to the ISFSI site, the watersheds of Humboldt Bay and the bay itself are the most relevant surface water bodies. Humboldt Bay is a large, shallow body of water with deep channels, separated from the ocean by two long, narrow spits. It is a tidal bay, receiving and discharging ocean water through the inlet between the spits. The bay is approximately 22.5 km (14 mi) long, its width ranging from 0.8 km (0.5 mi) near its middle to over 3.2 km (2 mi) at the south end and 6.4 km (4 mi) at the north end, with an average depth of 3.7 m (12 ft) MLLW. Very little fresh water discharges into Humboldt Bay.

Wetlands also are present in the vicinity of the ISFSI, to the east and south. Those closest to the site are classified as “freshwater emergent” or “estuarine and marine wetland” under the National Wetlands Inventory classification.

### **6.4.2 Groundwater**

PG&E investigated groundwater in the ISFSI site area over a several-year period during the mid- to late-1980s. Two areas were investigated in detail, one near HBPP Unit 3 and one near the former wastewater pond site that is east of Unit 3. Based on information taken from borings and analysis of the stratigraphy and aquifer characteristics, several aquifers and zones of perched groundwater in the ISFSI Site Area are evident. Groundwater level and flow direction at the Humboldt Bay ISFSI is influenced by several factors, including topography, proximity to Humboldt Bay, stratigraphy, and tectonic tilting and faulting of the Hookton Formation. Beneath the ISFSI site, the first aquifer encountered is the upper Hookton aquifer. The top of this aquifer is located at approximately 1.8 m (6 ft) above MLLW or approximately 6.7 m (22 ft) below the base of the ISFSI. Localized perched water zones are also found beneath the HBPP site.

### **6.5 Geology and Seismology**

HBPP and the ISFSI site are on the east flank of Buhne Point, a small headland on the eastern shore of Humboldt Bay. The site is underlain by a thick sequence of late Tertiary and Quaternary sedimentary rocks, and is capped by a late Pleistocene terrace. The main geologic formation in the area is the Pleistocene Hookton Formation that is about 335 m (1100 ft) thick beneath the ISFSI site area. Its sediments hold several of the important groundwater aquifers in the area and the region. Buhne Point is situated within the Little Salmon fault zone, and has been uplifted and tilted gently to the northeast by displacement on the fault. Mapping, borehole, trenching, and dating studies at and near the HBPP site were used to document the stratigraphy of the site.

Four traces of the Little Salmon fault zone are mapped in the vicinity of the ISFSI site. These include two primary fault traces: the Little Salmon and Bay Entrance faults, and two subsidiary faults: the Buhne Point and Discharge Canal faults, located in the hanging wall of the Bay Entrance fault. The Little Salmon, Bay Entrance, and Buhne Point faults all dip to the northeast and displace the Hookton Formation down to the southwest. The Discharge Canal fault dips steeply to the southwest and has down-to-the-northeast displacement. Faults in the Little Salmon fault zone are close to the site and have the potential to generate large-magnitude earthquakes (PG&E, 2003a). However, the style and structure of deformation associated with future activity along the Little Salmon fault zone is not expected to cause surface rupture, and the site is not susceptible to deep landslides from such activity.

Tsunami hazards along the coast of northern California have been recognized for many decades. The tsunami associated with the 1964 "Good Friday" Alaska earthquake was very destructive in Crescent City (approximately 136.8 km (85 mi) to the north) and caused minor run-ups within Humboldt Bay. The ISFSI is located at 13.4 m (44 ft) above mean lower low water, which would be 2.4 m (8 ft) higher than the conservative estimates of tsunami run-up calculated by PG&E. Even if the ISFSI were inundated by a tsunami, the casks would be protected from tsunami-generated flowing water and water-borne debris within the vault. The storage casks can be temporarily wetted with seawater without harm to the casks.

### **6.6 Ecology**

The vicinity within 8.0 km (5 mi) of the ISFSI site provides a wide array of habitats for plants and animals. Terrestrial ecological surveys identified more than 200 vascular plants and 12 vegetation communities in the area in and around the ISFSI site.

PG&E-owned land near the ISFSI site was inventoried for the presence of special status plant species in 1999 and 2002. Site vegetation habitats, present in the ISFSI area consist primarily of disturbed coastal terrace prairie. A comprehensive field study in 2002 on the HBPP site did not locate suitable habitat for or any presence of plant species designated for special status by the State of California or federally listed or candidate threatened or endangered plant species.

Numerous special status terrestrial wildlife species occur within the ecologically diverse and productive habitats in the vicinity of the ISFSI project site. Inventories conducted in 1999 and 2002 on PG&E-owned property, including the ISFSI site, did not indicate the presence of any of these species and found that the lack of suitable habitat made their presence unlikely.

An inventory of PG&E-owned land, including the ISFSI site, in 1999 and 2002 did not observe special status species of fish on PG&E property or at the ISFSI site. Lack of suitable habitat for these species indicates that they are not present at the ISFSI site.

PG&E-owned land in the vicinity of the ISFSI site was inventoried for the presence of special status freshwater aquatic species in 1999 and 2002. No special status freshwater aquatic species appear to occur at the ISFSI site.

## **6.7 Transportation**

The HBPP site area is not traversed by a public highway or a railroad. The only access to the ISFSI site is from the south via King Salmon Avenue, which also serves the community of King Salmon situated on the western part of the peninsula. A public-access trail runs along the shoreline and along the fence to the northwest of the PG&E-controlled area.

The major travel access in the vicinity of the ISFSI and other communities of Humboldt County is via US Highway 101, which generally traverses north-south through Humboldt County. This highway passes about 0.48 km (0.3 mi) southeast of the ISFSI site and is accessible approximately 0.56 km (0.35 mi) to the southeast of the site. Highway 101 continues north into Oregon and south to San Francisco and Los Angeles.

## **6.8 Regional Historic, Scenic, Cultural, and Natural Features**

No ethnographic sites are located within the Humboldt Bay site and surrounding area. According to a map of ethnographic site locations made near the turn of the century, one village site was located adjacent to the project on Buhne Point, but apparently it had been washed away by 1918.

There are no properties within the Area of Potential Effects of the proposed action (the 143-acre HBPP site) that are listed on the National Register of Historic Places. There is one property within the Area of Potential Effects – HBPP Unit 3 – that PG&E determined was eligible for listing on the National Register of Historic Places.

No cultural resources were identified within the HBPP site during the licensee's study conducted to support initial ISFSI license issuance. Considering the amount of ground disturbance that has taken place in the project area in the past, the staff determined that it is highly unlikely that additional unidentified resources may be present. However, certain conditions, such as dense vegetation or pavement, may have prevented a resource from being detected during the inventory. PG&E noted that no cultural artifacts or archaeological items were observed during Humboldt Bay ISFSI construction activities. PG&E also confirmed that, although no physical

changes to the environment or structures are proposed as part of the proposed action, PG&E's current excavation program requires work stoppage and taking appropriate actions if unexpected conditions occur or unidentified items are unearthed (PG&E, 2013a).

## **6.9 Background Radiological Characteristics**

PG&E conducts environmental monitoring of the ISFSI and surrounding area under the HBPP site-wide environmental monitoring program. As no radioactive gas, liquid, or solid waste effluents are released from the Humboldt Bay ISFSI during operation, a radioactive effluent monitoring system is not required. The construction and design of the seal-welded canisters ensures no release of radioactive gaseous, liquid, or solid effluents from the ISFSI. PG&E provides an annual radioactive effluent release report to the NRC, per 10 CFR 72.44(d), noting that no radionuclides are released to the environment from liquid or gaseous effluents.

As the radioactive material stored in the ISFSI, including the proposed GTCC process waste, emits direct radiation, PG&E's environmental monitoring program monitors direct radiation from the ISFSI through the use of thermoluminescent dosimeters (TLDs). TLDs at fixed locations are used to record and trend area gamma doses at locations in the vicinity of the ISFSI, and TLDs are read quarterly. Quarterly surveys are also performed in accessible areas of the ISFSI, consisting of contamination surveys and external radiation measurements in appropriate areas. Through the environmental monitoring program, PG&E evaluates exposure to the public during the term of the ISFSI license and verifies compliance with dose limits in 10 CFR 72.104. PG&E provides an annual radiological environmental monitoring report to the NRC. The most recent report (PG&E, 2012a) noted the dose to the maximum exposed individual from the ISFSI would be 0.022 millisievert (mSv) (2.2 millirem (mrem)) per year, which is below the annual limits specified in 10 CFR 20.1301(a) and 10 CFR 72.104(a), of 1 mSv (100 mrem) and 0.25mSv (25 mrem), respectively.

## **7.0 The Environmental Impacts of the Proposed Action**

The NRC staff has evaluated the potential environmental impacts associated with the proposed action of adding the GTCC process waste as a material to be stored in the Humboldt Bay ISFSI. The NRC staff reviewed and considered the following documents in the development of this EA:

- PG&E's license amendment request and environmental consideration (PG&E, 2010, 2011a; 2011b; 2011c; 2012b; 2012c; 2012d; 2013a; 2013b; 2013c)
- NRC's Environmental Assessment Related to Construction and Operation of the Humboldt Bay Independent Spent Fuel Storage Installation (NRC, 2005b)
- NRC's consultation with Federal agencies, Native American Tribes, and State and local government agencies (See Section 8.0).

Some aspects of the proposed action, the affected environment, and the interaction between the two were addressed in past NRC environmental reviews. Therefore, to limit redundancy and to focus this EA on issues that have not been previously evaluated, the NRC staff refer to previous environmental review documents for more detailed descriptions of those aspects of analysis that remain unchanged. In addition, the development of this EA was coordinated with the safety evaluation report development.

The staff performed this review in accordance with the requirements of 10 CFR Part 51 and staff guidance found in NUREG-1748 (NRC, 2003a). In accordance with this guidance, the staff evaluated the direct effects, indirect effects, and cumulative impacts that each resource area

may encounter from the proposed action. The staff evaluated the radiological and non-radiological impacts of the proposed action on each resource area. The staff categorized the impacts in terms of small, moderate, or large, defined as follows:

- **SMALL**—environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- **MODERATE**—environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.
- **LARGE**—environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

As discussed below, the NRC staff expects that potential environmental impacts associated with storage of the GTCC process waste in the Humboldt Bay ISFSI are bounded by the environmental impacts associated with construction, operation, and decommissioning of the ISFSI. These environmental impacts were evaluated in the NRC staff's assessment, "Environmental Assessment Related to the Construction and Operation of the Humboldt Bay Independent Spent Fuel Storage Installation," dated October 2005 (NRC, 2005b), in which NRC staff concluded that the construction, operation, and decommissioning of the Humboldt Bay ISFSI would not result in a significant impact to the environment.

The NRC staff expects the radiological doses to workers and to the public associated with the proposed action to be bounded by previous analyses, and that radiological doses would be below the NRC's regulatory limits in 10 CFR Part 20 and Part 72. Additionally, the NRC staff expects that non-radiological environmental impacts from storage of the GTCC process waste in the ISFSI, would be bounded by those previously analyzed, because: (1) the proposed action would not involve any construction activities, land disturbance, excavation, physical changes to the HBPP facilities, or changes in land use; (2) operation of the ISFSI does not require usage of water resources; and (3) the ISFSI does not generate gaseous, liquid, or solid effluents or wastes during operation.

The proposed action involves a change associated with ISFSI operations, by the addition of the GTCC process waste as a material that can be stored in the existing Humboldt Bay ISFSI. The GTCC process waste would be stored in the same GTCC storage cask as the GTCC activated metal waste that is already approved to be stored in the ISFSI. There would be a minor change in the design of the GWC to hold the process waste container that contains the process waste. There would also be a minor change in loading operations in the spent fuel pool, in that the container holding the process waste would need to be placed in the GWC before the activated metal.

## **7.1 Land Use**

The proposed action would not involve any construction activities, land disturbance, excavation, physical changes to the HBPP facility, or changes in land use. The GTCC storage cask is already authorized to be stored at the ISFSI, and no expansion of the existing ISFSI footprint is needed. Therefore, because NRC staff expects no new or changed land uses as a result of this proposed action, NRC staff concludes that the impact to land use would be **SMALL** and would not be significant.

## **7.2 Transportation**

NRC staff expects the proposed license amendment would not change or increase traffic volume. The GTCC storage cask is already authorized to be loaded, transported to the ISFSI, and stored at the ISFSI. A tracked transporter vehicle would be used to transport the GTCC storage cask from the HBPP Unit 3 refueling building to the ISFSI location, along a route entirely within the HBPP site. The GTCC process waste was thermally processed to remove organics and other hydrogen bearing components to reduce the potential for hydrogen generation during long term storage or future transportation. Thus, the addition of the GTCC process waste to the GTCC cask at the ISFSI would not impact the ability to safely store and eventually transport the waste from the site in the future. ISFSI decommissioning activities would commence at a future time, after the storage casks are removed from the ISFSI vault and transported offsite. Thus, the proposed action to allow GTCC process waste to be included in the GTCC storage cask would not change the transportation impacts already evaluated in the original EA supporting ISFSI license issuance (NRC, 2005b). Therefore, the NRC staff concludes that the impact from transportation would be SMALL and would not be significant.

## **7.3 Socioeconomics**

Approval of the proposed action would not result in any construction or expansion of the existing ISFSI footprint or operations. The licensee is already authorized to load, transport, and store the GTCC storage cask at the ISFSI. Also, including the GTCC process waste in the GTCC storage cask would not require any additional employees to maintain and/or operate the ISFSI. The staff also does not expect that direct employment, taxes, and services would change as a result of the proposed action. Therefore, the NRC staff does not expect any changes in socioeconomic impacts beyond those originally evaluated by NRC staff in the original EA supporting ISFSI license issuance (NRC, 2005b), which concluded that there would be no impact to socioeconomics. Therefore, the NRC staff concludes that the impact to socioeconomics from the proposed action would be SMALL and would not result in a significant environmental impact.

## **7.4 Air Quality**

The proposed action does not involve any construction, excavation, or ground disturbance. Due to the design of the GTCC storage cask used at the ISFSI, no gaseous effluents are generated or released at the ISFSI during operation. The proposed action would not result in any changes in the types, characteristics, or quantities of radiological or non-radiological effluents at the ISFSI. The GTCC storage cask is designed to confine radioactive material during all normal, off-normal, and accident conditions. Air quality impacts from transportation of the GTCC storage cask from HBPP Unit 3 refueling building to the ISFSI, via the tracked transporter vehicle, has already been analyzed as part of NRC staff's EA associated with the original licensing of the ISFSI (NRC, 2005). The NRC staff expects that the proposed action would not change transportation at or away from the Humboldt Bay site. Thus, the NRC staff does not expect changes in air quality impacts as a result of this proposed action beyond those analyzed by staff in the original EA that supported license issuance (NRC, 2005b), which concluded that there would be no significant impacts to air quality. Therefore, the NRC staff concludes that the impact from the proposed action to air quality would be SMALL and would not be significant.

## **7.5 Geology and Soils**

The proposed action does not involve any construction, excavation, or ground disturbance. Due to the design of the GTCC storage cask used at the ISFSI, no gaseous or liquid effluents are generated or released, nor is solid waste generated at the ISFSI during operation. The GTCC storage cask is designed to confine radioactive material during all normal, off-normal, and accident conditions. The GWC lid weld is designed to ensure no credible leakage of radioactive materials will occur, and a separate closure ring weld provides a redundant welded boundary to prevent leakage. Therefore, the NRC staff concludes that there would be no changes to the impacts to geology and soils from the proposed action beyond those analyzed by staff in the original EA that supported license issuance (NRC, 2005b), which concluded that there would be no significant impacts. Therefore, the NRC staff concludes that the impact from the proposed action to geology and soils would be SMALL and would not be significant.

## **7.6 Water Resources**

The NRC staff expects that the proposed action would not change water consumption, as the operation of the ISFSI does not require usage of water resources. The operation of the ISFSI also does not generate or release liquid effluents. The proposed action would not result in any changes in the types, characteristics, or quantities of radiological or non-radiological effluents or solid waste. Therefore, the NRC staff does not expect changes to the impacts to water resources as a result of the proposed action, and has determined that impacts are bounded by the staff's analysis in the original EA that supported license issuance (NRC, 2005b), which concluded that there would be no significant impacts to water resources. Therefore, the NRC staff concludes that the impact from the proposed action to water resources would be SMALL and would not be significant.

## **7.7 Ecology**

Due to the design of the GTCC storage cask used at the ISFSI, no gaseous or liquid effluents are released, nor is solid waste generated at the ISFSI during operation. The proposed action would not result in any changes in the types, characteristics, or quantities of radiological or non-radiological effluents or solid waste. Operation of the ISFSI does not require usage of water resources. No construction activities, land disturbance, or physical changes to the environment are associated with the proposed action. Therefore, the NRC staff does not expect changes to impacts on ecological resources, and impacts are bounded by the staff's analysis in the original EA that supported ISFSI license issuance (NRC, 2005b), which concluded that there would be no significant impacts to ecology. Therefore, the NRC staff concludes that the impact from the proposed action to ecology would be SMALL and would not be significant.

### ***7.7.1 Threatened and Endangered Species***

In the staff's original EA supporting ISFSI license issuance, the staff determined that the proposed action would have no effect on an endangered or threatened species or critical habitat within the areas of influence for the construction, operation, and decommissioning of the ISFSI. NRC staff consulted with the Federal and State agencies regarding the proposed action and the staff's preliminary determination that the proposed action would not affect listed endangered or threatened species or their critical habitat (see Section 8.0 of this EA). USFWS responded stating that it did not have concerns with the project as stated (USFWS/AFWO, 2013b). The NRC staff does not expect changes to impacts on threatened and endangered species and their

critical habitat, as a result of the proposed action, beyond those originally evaluated by NRC staff in the original EA supporting ISFSI license issuance (NRC, 2005b).

## **7.8 Noise**

The NRC staff does not expect that the proposed action would involve new activities that would generate noise, as the transportation of the GTCC storage cask from the HBPP Unit 3 refueling building to the ISFSI is already authorized. The environmental impacts from noise were evaluated in the original EA supporting ISFSI license issuance (NRC, 2005b), which concluded that there would be no significant impacts. Thus, because the NRC staff does not expect changes to noise impacts as a result of the proposed action, the NRC staff concludes that such impacts would be SMALL and would not be significant.

## **7.9 Historic and Cultural Resources**

The proposed action does not involve any construction, excavation, or ground disturbance. Due to the design of the GTCC storage cask used at the ISFSI, no gaseous or liquid effluents are generated or released at the ISFSI during operation. The proposed action would not result in any changes in the types, characteristics, or quantities of radiological or non-radiological effluents at the ISFSI. Operations associated with the proposed action include loading the GTCC process waste into a storage cask in the HBPP Unit 3 spent fuel pool. These loading operations are nearly identical to those considered in the original EA supporting ISFSI license issuance (NRC, 2005b), for which NRC staff determined that the proposed action would not impact the distinctive characteristics of the HBPP Unit 3.

PG&E noted that no cultural artifacts or archaeological items were observed during Humboldt Bay ISFSI construction activities. PG&E also confirmed that, although no physical changes to the environment or structures are proposed as part of this proposed action, PG&E's current excavation program requires work stoppage and taking appropriate actions if unexpected conditions occur or unidentified items are unearthed (PG&E, 2013a).

As part of its evaluation of potential impacts on historic and cultural resources, the NRC staff consulted with the California Historic Preservation Office, the California Native American Heritage Commission, and three Federally-recognized Indian Tribes – the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria. Details of these consultations are provided in Section 8.0 of this EA. The State Historic Preservation Officer (SHPO) at the California Office of Historic Preservation concurred with NRC's determination that the proposed action will not affect historic properties (California Office of Historic Preservation, 2013).

The staff concludes that the proposed action will have no effect on historic and cultural resources.

## **7.10 Visual and Scenic Resources**

The proposed action does not involve any construction activities, land disturbance, excavation, or physical changes to the HBPP facility, site, or physical environment. Therefore, the NRC staff does not anticipate any changes in the local or regional scenic quality or any impacts to visual and scenic resources as a result of the proposed action. Accordingly, the staff concludes that there would be no significant environmental impact.

## **7.11 Public and Occupational Health**

### **7.11.1 Non-Radiological Impacts**

Due to the design of the GTCC storage cask used at the ISFSI, no non-radiological gaseous or liquid effluents would be released, nor is solid waste generated at the ISFSI during operation. The proposed action would not result in any changes in the types, characteristics, or quantities of non-radiological effluents or solid waste. The proposed action does not involve any construction activities, land disturbance, excavation, or physical changes to the HBPP facility, site, or physical environment. The ISFSI operations associated with the proposed action are nearly identical to those already reviewed by the staff in the original EA that supported ISFSI license issuance (NRC, 2005b), which were found to not have a significant impact. Therefore, the NRC staff concludes that the non-radiological impacts from the proposed action would be SMALL and would not result in a significant environmental impact.

### **7.11.2 Radiological Impacts**

Due to the design of the GTCC storage cask used at the ISFSI, no radiological gaseous or liquid effluents are released, nor is solid waste generated at the ISFSI during operation. The proposed action would not result in any changes in the types, characteristics, or quantities of radiological effluents or solid waste. The GTCC storage cask is designed to confine radioactive material during all normal, off-normal, and accident conditions. The GWC lid weld is designed to ensure no credible leakage of radioactive materials will occur, and a separate closure ring weld provides a redundant welded boundary to prevent leakage. NRC staff has determined that the process of sealing and leak testing the process waste container and the GWC provide adequate assurance that there will be no path for a release of radioactive material from the GWC.

PG&E conducts environmental monitoring of the ISFSI and surrounding area under the HBPP site-wide environmental monitoring program. As no radioactive gas, liquid, or solid waste effluents are released from the Humboldt Bay ISFSI during operation, a radioactive effluent monitoring system is not required. The construction and design of the seal-welded canisters are intended to ensure no release of radioactive gaseous, liquid, or solid effluents from the ISFSI. PG&E provides an annual radioactive effluent release report to the NRC, per 10 CFR 72.44(d), noting that no radionuclides are released to the environment from liquid or gaseous effluents.

As the radioactive material stored in the ISFSI, including the proposed GTCC process waste, emits direct radiation, PG&E's environmental monitoring program monitors direct radiation from the ISFSI through the use of TLDs. TLDs at fixed locations are used to record and trend area gamma doses at locations in the vicinity of the ISFSI, and TLDs are read quarterly. Quarterly surveys are also performed in accessible areas of the ISFSI, consisting of contamination surveys and external radiation measurements in appropriate areas. Through the environmental monitoring program, PG&E evaluates exposure to the public during the term of the ISFSI license and verifies compliance with dose limits in 10 CFR 72.104. PG&E provides an annual radiological environmental monitoring report to the NRC. The most recent report (PG&E, 2012a) noted the dose to the maximum exposed individual from the ISFSI would be 0.022 millisievert (mSv) (2.2 millirem (mrem)) per year, which is below the annual limits specified in 10 CFR 20.1301(a) and 10 CFR 72.104(a), of 1 mSv (100 mrem) and 0.25mSv (25 mrem), respectively.

The NRC conducts periodic inspections of the HBPP site and ISFSI, including inspections of ISFSI operation and the licensee's effluent and environmental monitoring program. An inspection was conducted in January 2010 (NRC, 2010a). The inspectors found that the ISFSI facility was well maintained and dose rates around the perimeter were being monitored. Environmental dosimetry was provided by TLDs placed on each of the four sides of the ISFSI protected area fence and in the owner-controlled area. The location of the dosimeters was appropriate for measuring the environmental dose rates around the facility. Perimeter dose rates remain at background levels due to the shielding provided by the ISFSI structure. During a March 2012 inspection (NRC, 2012a), inspectors reviewed the licensee's effluent and environmental monitoring program and concluded that the licensee conducted effluent and environmental monitoring in accordance with its license and applicable regulatory requirements.

In the original EA supporting initial license issuance, the NRC staff analyzed the radiological impacts, including an assessment of occupational dose and dose to the general public. The staff concluded that PG&E conservatively estimated the occupational doses, and the doses are well below the 10 CFR 20.1201(a)(1) annual limit for occupational doses of 5 mSv (500 mrem). The staff also concluded that PG&E conservatively calculated public dose, and the calculated public dose is significantly below the annual limits specified in 10 CFR 72.104(a) and 10 CFR 20.1301(a), of 0.25 mSv (25 mrem) and 1 mSv (100 mrem), respectively. In the original EA supporting initial license issuance, the staff also reviewed calculations and assumptions provided by PG&E and performed confirmatory calculations to verify the source term and checked the dose rates. Staff concluded that normal ISFSI operations would not have a significant onsite or offsite radiological impact.

With regard to this proposed license amendment, the total radioactivity contained in the process waste is 48.5 Curies. The NRC staff determined that this level of radioactivity is significantly less than that associated with a single spent fuel assembly and would result in a negligible contribution to the external dose rate of the storage cask. The GWC lid weld is designed to ensure no credible leakage of radioactive materials will occur, and a separate closure ring weld provides a redundant welded boundary to prevent leakage. In addition, the process waste container and the GWC are tested for leakage. The NRC staff concluded that the weld seal and leak-testing provides adequate assurance that there will be no path for a release of radioactive material from the GTCC cask. As a result, the staff has determined that there is reasonable assurance that the proposed system for confinement of the process waste would meet the requirements in 10 CFR 72.104.

Finally, the proposed action would not affect the staff's previous radiation protection evaluation that supported the original license issuance. Therefore, the radiological impacts on workers and the public, as a result of the proposed action, are bounded by the impacts evaluated in the original EA supporting ISFSI license issuance (NRC, 2005b). Therefore, the NRC staff concludes that the radiological impact from the proposed action would be SMALL and thus to have no significant environmental impact.

### **7.11.3 Accidents**

Through its review of the initial Humboldt Bay ISFSI license application, the NRC staff concluded that the ISFSI and cask (for storage of spent fuel and for storage of GTCC waste) design are structurally sound. The NRC staff also concluded that the components of the ISFSI that are important to safety would continue to perform their design functions during normal operation, off-normal conditions, and any credible postulated accidents.

The proposed action to add GTCC process waste to the sixth cask at the ISFSI does not affect the staff's previous accident analysis evaluation that supported original license issuance, and the proposed action would not increase the probability or consequences of accidents. Therefore, the accident analyses in the initial license application are bounding for the proposed action, and there are no changes to accident impacts as a result of the proposed action (NRC, 2005b).

## **7.12 Waste Management**

Due to the design of the GTCC storage cask used at the ISFSI, no gaseous or liquid effluents are released, nor is solid waste generated at the ISFSI during operation. The proposed action would not result in any changes in the types, characteristics, or quantities of radiological or non-radiological effluents or solid waste. Therefore, the NRC staff does not expect changes to waste management as a result of the proposed action and considers such impacts to be SMALL and thus to have no significant environmental impact.

## **7.13 Impacts from a Hypothetical Terrorist Attack**

### ***7.13.1 NRC Security Requirements for Independent Spent Fuel Storage Installations***

The NRC has established requirements and has initiated several actions designed to provide high assurance that a terrorist attack would not lead to a significant radiological event at an ISFSI. These include: (1) the continual evaluation of the threat environment by the NRC, in coordination with the intelligence and law enforcement communities, which provides, in part, the basis for the protective measures currently required; (2) the protective measures that are in place to reduce the chance of an attack that leads to a significant release of radiation; (3) the robust design of storage casks, which provides substantial resistance to penetration; and (4) NRC security assessments of the potential consequences of terrorist attacks against ISFSIs, that inform the decisions made regarding the types and level of protective measures. Over the past 20 years, there have been no known or suspected attempts to sabotage, or to steal, radioactive material from storage casks at ISFSIs, or to directly attack an ISFSI. Nevertheless, NRC is continually evaluating the threat environment, to determine whether any specific threat to ISFSIs exists.

#### ***7.13.1.1 General Security Considerations***

In response to the September 11, 2001, terrorist attacks, and to intelligence information subsequently obtained, the U.S. government initiated Nation-wide measures to reduce the threat of terrorism. Since then, the Federal government has greatly improved the sharing of intelligence information and the coordination of response actions among Federal, State, and local agencies. NRC has been an active participant in these efforts; it has regular and frequent communications with other Federal, State, and local government agencies and industry representatives, to discuss and evaluate the current threat environment, to assess the adequacy of security measures implemented at licensed facilities, and, when necessary, to recommend additional actions.

The NRC expanded its system for notifying licensees of possible threats to their facilities, after the September 11, 2001, terrorist attacks, to include a broader range of licensees, including ISFSI licensees. NRC has incorporated the threat condition levels used in the Department of Homeland Security's National Terrorism Advisory System (previously the Homeland Security Advisory System) into its own threat advisory system. The NRC threat assessment staff

reviews, analyzes, coordinates, and disseminates threat and intelligence information relevant to its licensees, at both strategic and tactical levels. The threat assessment staff also serves as NRC's liaison and coordination staff with other organizations and agencies, including the intelligence and law enforcement communities. Through these improved coordination and communication functions, the NRC is able to efficiently develop and transmit advisories to the appropriate licensees, who are then able to take prompt action. Thus, the broad actions taken by the Federal government and the specific actions taken by the NRC since September 11, 2001, have helped to reduce the potential for terrorist attacks against NRC-regulated facilities.

#### *7.13.1.2 Requirements for ISFSIs*

The NRC considered the potential impacts of terrorist acts in the development and implementation of its 10 CFR Part 73 security requirements (NRC, 2007). The NRC's strategy for protecting public health and safety, the common defense and security, and the environment focuses on ensuring that its requirements, in combination with the design features of storage casks, are effective in protecting against the potential effects of terrorist attacks on ISFSIs. NRC security requirements provide high assurance that terrorist attacks cannot endanger the public's health and safety by intentionally releasing radiation from an ISFSI. The NRC reviews and approves facility security plans, in evaluating the adequacy of these on-site measures. The Humboldt Bay ISFSI is also inspected to ensure complete and correct implementation of the features of the site security plan as well as the applicable regulations and orders. The NRC staff has determined through recent inspections that the facility meets the requirements of 10 CFR Part 73, "Physical Protection of Plants and Materials," and applicable orders (NRC, 2010b; 2012b).

The details of specific security measures for each facility are designated as Safeguards Information, in accordance with Section 147 of the Atomic Energy Act and 10 CFR 73.21, and, for that reason, cannot be released to the public. However, key features of the security programs for ISFSIs include: (1) physical barriers; (2) surveillance; (3) intrusion detection; (4) intrusion response; and (5) offsite assistance from local law enforcement agencies, as necessary. After the September 11 terrorist attacks, the Commission initiated prompt and comprehensive actions to address both immediate and longer-term security measures for NRC-regulated facilities. In the months immediately after the attacks, the Commission issued numerous safeguards and threat advisories to its licensees, to strengthen licensees' capabilities and readiness to respond to a potential attack on a nuclear facility. As part of the longer-term efforts, NRC conducted a comprehensive review of the Agency's security program. This review examined specific threats, such as a land-based vehicle bomb, ground assault with the use of an insider, and water-borne assaults, which have led to the imposition of additional requirements, through orders and rules, affecting many categories of licensees, including ISFSIs.

The Commission has issued orders to all licensees of operating ISFSIs to implement additional security enhancements identified in NRC's ongoing comprehensive review of its safeguards and security programs and requirements. These orders, imposing additional security measures, were issued to PG&E for the Humboldt Bay ISFSI prior to the loading of spent fuel into the facility (NRC, 2006). These measures, which the NRC staff has determined through its inspection activities to be fully implemented, include: (1) increased security patrols; (2) augmented security forces and weapons; (3) additional security posts; (4) heightened coordination with local law enforcement and military authorities; (5) enhanced screening of personnel; and (6) additional limitations on vehicular access. Collectively, these measures further reduce the already low probability of a successful terrorist attack on an ISFSI, by

providing high assurance that an attempted attack could be detected; and by mitigating the extent of damage and the potential radiological consequences if an attack were successful. Based on its ongoing consideration of safeguards and security requirements, its review of information provided by the intelligence community, and the implementation of additional security measures at the Nation's ISFSIs, the NRC has high assurance that public health and safety and the environment, and the common defense and security, continue to be adequately protected in the current threat environment.

### **7.13.2 Consideration of Environmental (Radiological) Impacts from Terrorist Acts**

The NRC staff has considered the potential radiological impacts of terrorist acts on ISFSIs, even though the staff considers the probability of a malevolent act against an ISFSI that results in a significant radiological event to be very low. By design, storage casks are highly resistant to penetration. To be licensed or certified by the NRC, these casks must meet stringent requirements for structural, thermal, shielding, and criticality performance, and confinement integrity, for normal and accident events. Consequently, storage casks are extremely robust structures, specifically designed to withstand severe accidents, including the impact of tornado-generated missiles.

The Humboldt Bay ISFSI's robust design and construction provides multiple layers of protection. The GTCC storage cask that would store the GTCC process waste at the Humboldt Bay ISFSI consists of a stainless steel cylindrical GWC (that contains the GTCC waste) and a HI-STAR HB overpack that contains the GWC during transfer and storage. After the GTCC waste is loaded in the GWC, the GWC will be dried, backfilled with helium, and seal-welded to prevent leakage of radioactive material. The GWC is designed to confine the radioactive material during all normal, off-normal, and accident conditions. The GWC lid weld ensures that no credible leakage of radioactive materials will occur, and a separate closure ring weld provides a redundant welded boundary to prevent leakage. The GTCC process waste will reside in the bottom-center of the GWC, surrounded by activated metal waste. The loaded GWC is placed in the HI-STAR HB overpack, which is a heavy-walled, multilayered, cylindrical vessel, constructed of carbon steel, which provides radiation shielding and protects the canister from missiles and natural phenomena.

In addition, a unique protective feature of the Humboldt Bay ISFSI is that the storage casks are installed in an in-ground concrete storage vault. The storage vault is comprised of six below-grade, vertically oriented, cylindrical storage cells that are structural units constructed of steel-reinforced concrete with a carbon steel liner. Each storage cell is approximately 2.7 m (9 ft) in diameter by 3.5 m (11 ft, 7 inches) deep. The bottom of the vault is constructed of 0.9 m (3 ft) thick reinforced concrete, with the end walls of approximately 2.1 m (7 ft) thick and the longitudinal (side) walls of 1.7 m (5-1/2 ft) thick concrete. The concrete wall thickness varies around the circumference of the storage cells and has a minimum thickness of approximately 0.2 m (9 inches) to 0.3 m (1 ft) of concrete between adjacent cells. The elevation of the vault top (without the storage cell lids installed) is approximately flush with grade, with the lids approximately 0.4 m (16-1/4 inches) high, not including the height of the lid bolt caps. The sixth vault storage cell would store the GTCC cask that contains the process waste. The vault provides additional shielding and protection of the storage casks (PG&E, 2009b). Based on these facts, and the results of the security assessments of ISFSIs (discussed below), the NRC has determined that the current design features and additional security measures in place provide high assurance that the Humboldt Bay ISFSI, and the GTCC process waste that is proposed to be stored there, is adequately protected.

Because of the uncertainty inherent in assessing the likelihood of a terrorist attack, the NRC recognizes that, under general credible threat conditions, although the probability of such an attack is believed to be low, it cannot be reliably quantified. The NRC has adopted an approach that focuses on ensuring that the safety and security requirements, and other security measures, are adequate and effective in countering and mitigating the effects of terrorist attacks against storage casks. To provide high assurance that a terrorist act will not lead to significant radiological consequences, NRC has analyzed plausible threat scenarios and required enhanced security measures to protect against the threats, and has developed emergency planning requirements, which could mitigate potential consequences for certain scenarios. As stated above, all these actions have been taken without regard to the probability of an attack. This protective strategy reduces the risk from a terrorist attack to an acceptable level.

#### *7.13.2.1 Development of the Generic Security Assessments*

Following issuance of the 2002 security orders for ISFSIs, the NRC used a security assessment framework as a screening and assessment tool to determine whether additional security measures, beyond those required by regulation and the security orders, were warranted for NRC-regulated facilities, including ISFSIs (Kipp, 2004; Smith, 2004; Yoshimura, 2004). Initially, the NRC screened threat scenarios to determine plausibility. This screening was informed by information gathered through the NRC's regular interactions with the law enforcement and intelligence communities. For those scenarios deemed plausible, the NRC assessed the attractiveness of the facility to attack by taking into account factors such as iconic value, complexity of planning required, resources needed, execution risk, and public protective measures. Separately, the NRC made conservative assessments of consequences, to assess the potential for prompt fatalities from radiological impacts from those plausible scenarios. The NRC then looked at the combined effect of the attractiveness and the consequence analyses, to determine whether additional security measures for ISFSIs were necessary.

In conducting the security assessments for ISFSIs, the NRC chose several storage cask designs that were representative of most currently NRC-certified designs. Plausible threat scenarios considered in the generic security assessments for ISFSIs included a large aircraft impact similar in magnitude to the attacks of September 11, 2001, and ground assaults using expanded adversary characteristics consistent with the design basis threat for radiological sabotage for nuclear power plants. The resulting generic assessments formed the basis for NRC's conclusion that there was no need for further security measures at ISFSIs beyond those currently required by regulation and imposed by orders issued after September 11, 2001.

#### *7.13.2.2 Comparison of the Generic Security Assessment to Humboldt Bay*

The NRC staff reviewed the analyses done for the generic ISFSI security assessments and compared the assumptions, including storage cask design and atmospheric dispersion, used in these generic assessments to the relevant features of the Humboldt Bay ISFSI. Based on this comparison, the staff determined that the assumptions used in the generic ISFSI security assessment regarding the storage cask design and the atmospheric dispersion are representative of the actual conditions at the Humboldt Bay ISFSI. The staff determined that a storage cask design used in the generic security assessments is representative of the GTCC storage cask design used at the Humboldt Bay ISFSI because the cask design and materials of construction are similar. The staff also determined that the atmospheric dispersion assumptions used in the generic security assessments are representative of the actual conditions at the Humboldt Bay ISFSI by comparing the wind speeds and atmospheric stability class.

The staff performed an evaluation to compare the radioactive material in the GTCC process waste to the source term (amount of radioactive material released) for the generic assessments, to determine whether the dose consequences of the generic assessments would be bounding for the addition of the GTCC process waste to the ISFSI. For the purposes of the comparison, the staff did not take into account the presence of the GTCC storage cask, the presence of the GTCC activated metal waste that would surround the process waste in the storage cask, or the fact that the GTCC storage cask would be located in an in-ground concrete storage vault, and the staff thus assumed that the entire inventory of the GTCC process waste is released from the GTCC storage cask and is respirable.

Based on this evaluation, the staff determined that the dose consequences of a GTCC process waste release would be bounded by, and are expected to be 3 orders of magnitude lower than, the dose consequences of the generic security assessments. The staff also determined that, assuming the entire GTCC process waste inventory is released, the projected doses to the maximum exposed individual would be well below 0.05 Sv (5 rem). In some situations, emergency planning and response actions could provide an additional measure of protection to help mitigate the consequences, in the unlikely event that an attack were attempted at the Humboldt Bay ISFSI. Therefore, the staff concluded that any doses associated with an attack on the GTCC process waste at the Humboldt Bay ISFSI would be much lower than the doses calculated using the assumptions for the generic security assessments, which as described above, are representative of the conditions at Humboldt Bay.

Therefore, as a terrorist attack on the GTCC process waste would not result in a significant release of radiation, the NRC staff concludes that the impact from a hypothetical terrorist attack would be SMALL and would not result in a significant environmental impact.

#### **7.14 Cumulative Impacts**

The NRC staff has evaluated whether cumulative environmental impacts could result from the incremental impact of the proposed action when added to past, present, or reasonably foreseeable future actions in the area. Ongoing and reasonably foreseeable future actions in the area include HBPP Unit 3 decommissioning activities.

PG&E is conducting HBPP Unit 3 decommissioning activities in accordance with its 10 CFR Part 50 license and its programs and procedures. Per 10 CFR 50.82(a)(6)(ii), PG&E cannot perform any decommissioning activities that result in significant environmental impacts not previously reviewed. Per requirements in 10 CFR 50.82(a)(4)(i), PG&E submitted a post-shutdown decommissioning activities report (PSDAR) to the NRC, which provided the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements (PG&E, 2009a). The staff's previous environmental impact statements related to HBPP Unit 3 decommissioning activities include NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities" (NRC, 1988), NUREG-1166, "Final Environmental Statement for Decommissioning Humboldt Bay Power Plant, Unit No. 3" (NRC, 1987), and NUREG-0586, Supplement 1, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities" (NRC, 2002).

The NRC staff evaluated the incremental impact of the addition of the proposed action to the HBPP Unit 3 decommissioning activities. As discussed above, NRC staff determined that there would be no significant environmental impacts from the proposed action for all resource areas. Since the NRC staff determined that the proposed action has no significant impact on

environmental resources, the NRC staff concludes that the proposed action would have a SMALL incremental contribution to cumulative impacts on environmental resources that would not be significant.

## **8.0 Agencies and Persons Consulted**

In accordance with NUREG-1748 (NRC, 2003a), the NRC staff consulted with several other agencies and parties regarding the environmental impacts of the proposed action. These consultations are intended to afford the designated agency or party the opportunity to comment on the proposed action and to ensure that the requirements of Section 106 of the NHPA, Section 7 of the Endangered Species Act, and Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act are met with respect to the proposed action.

### **8.1 California Energy Commission**

By telephone call on May 2, 2013, NRC staff discussed its preliminary findings with Ms. Joan Walter of the California Energy Commission (CEC) (NRC, 2013i). By electronic mail dated June 14, 2013, the NRC staff sent a copy of the draft EA to CEC for its review and comment (NRC, 2013j). By electronic mail dated July 12, 2013, Ms. Walter noted she had no comments on the draft EA (California Energy Commission, 2013).

### **8.2 Federally-Recognized Indian Tribes**

In order to identify issues relating to the proposed action's potential effects on historic properties, the NRC sought information from individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, including those that may be of religious and cultural significance to the Tribes. By letters dated March 29, 2013, the NRC sent letters to the California Native American Heritage Commission and three Federally-recognized Indian Tribes – the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria, requesting input on the NRC staff's preliminary determination that the license amendment will not adversely affect any historic sites and cultural resources (NRC, 2013c; 2013d; 2013e; 2013f). By email dated April 22, 2013, Ms. Janet Eidsness, a Blue Lake Rancheria representative requested additional information, and the NRC staff provided the additional information via email dated April 23, 2013 (NRC, 2013h). By email dated April 25, 2013, Ms. Eidsness noted she had no concerns for the proposed action (Blue Lake Rancheria, 2013). By email dated April 29, 2013, Ms. Erika Collins, a Bear River Band of Rohnerville Rancheria representative, noted she had no concerns for the proposed action (Bear River Band of Rohnerville Rancheria, 2013).

### **8.3 California Office of Historic Preservation**

By letter dated April 12, 2013, NRC staff sent a letter to Dr. Carol Roland-Nawi, SHPO at the California Office of Historic Preservation, requesting concurrence on the staff's preliminary determination that the license amendment will have no effect on historic properties, and requested comments or information (NRC, 2013g). By letter dated May 1, 2013, the SHPO concurred with NRC's determination that the proposed action will not affect historic properties (California Office of Historic Preservation, 2013).

#### **8.4 U.S. Fish and Wildlife Service**

Based on its assessment as documented in this EA, the NRC staff determined that the proposed action would have no effect on listed endangered or threatened species or critical habitat. By letter dated December 20, 2012, NRC staff provided its preliminary determination that the proposed action would not affect listed endangered or threatened species or their critical habitat, to the U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office (USFWS/AFWO), including an assessment in support of this determination, and invited comments or information (NRC, 2012d). By email dated January 9, 2013, Mr. Jim Watkins at USFWS/AFWO requested additional information on the proposed action (USFWS/AFWO, 2013a). By letter dated January 25, 2013, NRC provided additional information (NRC, 2013b). By email dated March 26, 2013, Mr. Jim Watkins noted that USFWS/AFWO did not have concerns with the project as stated (USFWS/AFWO, 2013b). The NRC staff has determined that a formal Endangered Species Act, Section 7 consultation is not required because the proposed action would not affect listed species or critical habitat.

#### **8.5 National Oceanic and Atmospheric Administration National Marine Fisheries Service**

Based on its assessment as documented in this EA, the NRC staff determined that the proposed action would have no effect on listed endangered or threatened marine species or critical habitat. By letter dated December 20, 2012, NRC staff provided its preliminary determination that the proposed action will not affect listed endangered or threatened marine species or their critical habitat, to the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) Southwest Regional Office, including an assessment in support of this determination, and invited comments or information (NRC, 2012e). By telephone conversation dated January 23, 2013, Mr. Clarence Hostler of the NMFS Southwest Region Arcata Area Office noted that NMFS generally does not respond to determinations of no effect by a Federal action agency, unless they have information contrary to the agency's preliminary determination (NRC, 2013a). The NRC staff has determined that a formal Endangered Species Act, Section 7 consultation is not required because the proposed action would not affect listed species or critical habitat.

In NRC staff's original EA of the ISFSI construction and operation, staff evaluated and determined that the construction and operation of the ISFSI would not adversely affect essential fish habitat for Humboldt Bay. The proposed action will not involve changes to any aspect of aquatic resources. Thus, an evaluation of essential fish habitat and consultation under Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act related to this proposed action are not necessary.

#### **9.0 Conclusion**

The NRC staff has reviewed PG&E's license amendment request to allow storage of GTCC process waste in the Humboldt Bay ISFSI. Based on its review of the proposed action, in accordance with the requirements in 10 CFR Part 51, the NRC staff has determined that approval of the proposed amendment to NRC License No. SNM-2514 to allow storage of GTCC process waste at the Humboldt Bay ISFSI will not significantly affect the quality of the human environment. For these reasons, NRC has determined that pursuant to 10 CFR 51.31, preparation of an Environmental Impact Statement is not required for the proposed action, and pursuant to 10 CFR 51.32, a Finding of No Significant Impact (FONSI) is appropriate.

## 10.0 References

Publicly available references can be accessed at the NRC Public Document Room located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at <http://www.nrc.gov/reading-rm/adams.html>. The ADAMS Accession No. for each publicly available reference is listed below.

References are organized alphabetically by author or organization. For those authors or organizations with multiple references, the references are then organized chronologically, with the oldest reference first. Progressively more recent references then follow, each preceded by "———" to indicate their relation to the previously identified author or organization.

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