

PG&E Letter HBL-21-016

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

Docket No. 50-133, License No. DPR-7  
Humboldt Bay Power Plant, Unit 3  
Request to Terminate the Humboldt Bay Power Plant 10 CFR Part 50 License

References:

1. PG&E Letter HBL-16-008, "Request for Partial Release of Humboldt Bay Power Plant Unit 3 Property from the Part 50 Site," dated November 9, 2016 (ML16326A004).
2. NRC Letter to PG&E, "Humboldt Bay Power Plant Unit 3 – Request for Partial Site Release from Part 50 License (CAC No. L53153)," dated January 5, 2018 (ML17115A108 and ML17115A109).

Dear Commissioners and Staff:

In accordance with 10 CFR 50.82(a)(9), Pacific Gas and Electric Company (PG&E) requests that the NRC terminate the Humboldt Bay Power Plant (HBPP) 10 CFR Part 50 License, Number DPR-7. PG&E has completed the final phase of decommissioning and is requesting that the NRC release the HBPP 10 CFR Part 50 licensed facility for unrestricted use.

The NRC approved License Termination Plan (LTP) for HBPP discusses PG&E's phased approach to decommissioning. In Reference 1, PG&E submitted a request for a partial release of approximately 30.4 acres known as the Fisherman's Channel, from the 10 CFR Part 50 License. In Reference 2, the NRC approved the release of this area.

The remaining area to be released includes the remainder of the 10 CFR Part 50 licensed area. PG&E has completed the remaining radiological decommissioning and Final Status Surveys (FSSs) for HBPP in accordance with the NRC approved LTP. The FSS Reports demonstrate that the site meets the criteria for decommissioning and release of the site for unrestricted use in accordance with 10 CFR Part 20, Subpart E, "Radiological Criteria for License Termination." The spent nuclear fuel and Greater than Class C waste remain stored at the Humboldt Bay (HB) Independent Spent Fuel Storage Installation (ISFSI), licensed under 10 CFR Part 72.

PG&E has reviewed the survey area results to ensure that the proposed action will have no adverse impact on the ability of the site, in aggregate, to meet 10 CFR Part 20, Subpart E. Accordingly, PG&E has satisfied the requirements governing termination of a facility license as stated in 10 CFR 50.82(a)(11), and requests that the NRC approve this application and terminate the HBPP 10 CFR Part 50 license. PG&E is submitting this request to terminate contingent upon approval of the remaining FSS Reports currently under NRC review.

The Enclosure provides a summary of the assessment performed for the remaining 10 CFR Part 50 licensed area.

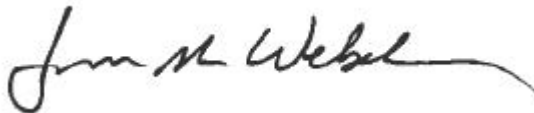
There are no new or revised regulatory commitments (as defined in NEI 99-04) in this letter.

If you have any questions or require additional supporting documentation for this submittal, please contact Mr. William Barley at 707-267-0071.

I state under penalty of perjury that the foregoing is true and correct.

Executed on October 21, 2021.

Sincerely,

A handwritten signature in black ink, appearing to read "James M. Welsch", with a long horizontal flourish extending to the right.

James M. Welsch  
*Senior Vice President, Generation and Chief Nuclear Officer*

Enclosure

cc: HBPP Humboldt Distribution  
cc/enc: Scott A. Morris, NRC Region IV Administrator  
Amy M. Snyder, NRC Reactor Decommissioning Branch Project Manager

**Introduction**

Humboldt Bay Power Plant (HBPP) Unit 3, located at 1000 King Salmon Avenue, Eureka, California, was a 63 MWe Boiling Water Reactor (BWR). Unit 3 was granted a construction permit by the Atomic Energy Commission (AEC) on October 17, 1960. Operating License DPR-7 was issued in August 1962. The unit began commercial operation in August 1963 and last operated in 1976. In June 1983 Pacific Gas and Electric Company (PG&E) announced its intention to decommission and the unit was permanently defueled in 1984.

PG&E submitted the HBPP Unit 3 Post-Shutdown Decommissioning Activities Report (PSDAR) to NRC on February 27, 1998, in accordance with 10 CFR 50.82 (a)(4)(i). The PSDAR and the Defueled Safety Analysis Report (DSAR) superseded the original Decommissioning Plan and provided the information required by 10 CFR 50.82(a)(4).

On November 17, 2005, the NRC issued Humboldt Bay (HB) Independent Spent Fuel Storage Installation (ISFSI) License SNM-2514 (Docket No. 72-27). Transfer of spent nuclear fuel to the onsite HB ISFSI was completed in December 2008. PG&E began actively decommissioning Unit 3 in June 2009.

As described in the License Termination Plan (LTP), PG&E submitted a request for a partial release of approximately 30.4 acres known as the Fisherman's Channel, from the 10 CFR Part 50 License (Reference 1). In January of 2018, the NRC approved the release of this area (Reference 2). The remaining area to be released includes the remainder of the 10 CFR Part 50 licensed area. PG&E has completed the remaining radiological decommissioning and Final Status Surveys (FSSs) for HBPP in accordance with the NRC approved LTP. PG&E submitted FSS Reports which demonstrated that these remaining areas of the site meet the criteria for decommissioning and release of the site for unrestricted use in accordance with 10 CFR Part 20, Subpart E, "Radiological Criteria for License Termination." As indicated in Table 1 below, the NRC has approved most of the FSS Reports, but a few remain for NRC review and approval. Table 1 provides reference to the PG&E FSS Reports and the corresponding NRC approval. The spent nuclear fuel and Greater than Class C waste remain stored at the HB ISFSI, licensed under 10 CFR Part 72.

**Table 1. PG&E FSS Reports and Corresponding NRC Approvals**

#	PG&E Submittal	NRC Approval
1	PG&E Letter HBL-17-001, Final Status Survey Report for New Generation Footprint Area, dated March 9, 2017 (ML17068A100)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports NGFA-EST and NGFA-WST, dated June 11, 2018 (ML18155A300)

#	PG&E Submittal	NRC Approval
2	PG&E Letter HBL-18-008, Final Status Survey Report for Mobile Emergency Power Plant Station Area (Survey Unit OOL10-04), dated July 19, 2018 (ML18200A248)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for OOL10-04 and ISF01-01, dated October 11, 2018 (ML18278A087)
3	PG&E Letter HBL-18-009, Final Status Survey Report for Independent Spent Fuel Storage Installation Area (Survey Unit ISF01-01), dated July 19, 2018	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for OOL10-04 and ISF01-01, dated October 11, 2018 (ML18278A087)
4	PG&E Letter HBL-19-011, Final Status Survey Report for the Relay Building (Survey Units RLY01-01 and RLY01-02) and the MEPPS Island Building (Survey Units MEPPS01-01 and MEPPS01-02), dated May 22, 2019 (ML19143A046)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for the Relay Building and the MEPPS Island Building, dated December 4, 2019 (ML19319B063 and ML19319A566)
5	PG&E Letter HBL-19-014, Final Status Survey Report for Six Survey Areas Within Survey Unit OOL10, dated October 17, 2019 (ML19291A014 and ML19290H613)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for Six Survey Areas within Survey Unit OOL10, dated February 12, 2020 (ML20030A099 and ML20030A100)
6	PG&E Letter HBL-20-007, Final Status Survey Report for the Humboldt Bay Power Plant Reactor Caisson Survey Units, dated April 1, 2020 (ML20092M643)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for Caisson Survey Units NOL01-09/ NOL01-09-FSR, dated August 3, 2021 (ML21214A100 and ML21214A101)
7	PG&E Letter HBL-20-010, Final Status Survey Report for the Humboldt Bay Power Plant Trailer City Area, dated May 21, 2020 (ML20142A287)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for Trailer City Survey Units (OOL09-01 Through OOL09-10), dated August 24, 2021 (ML21225A772 and ML21225A773)
8	PG&E Letter HBL-20-013, Final Status Survey Report for the Humboldt Bay Power Plant (Office Annex, Security Building, Intake Structure, Count Room Building, and Waste Management Facility), dated September 24, 2020 (ML20268B244)	NRC Letter, Humboldt Bay Power Plant, Unit 3 – Approval of Final Status Survey Reports for Office Annex, Security Building, Intake Structure, Count Room Building and Waste Management Facility Survey Units, dated August 25, 2021 (ML21225A775 and ML21225A776)
9	PG&E Letter HBL-21-010, Final Status	NRC Review

#	PG&E Submittal	NRC Approval
	Survey Reports for the Humboldt Bay Power Plant, dated June 8, 2021 (ML21160A224)	
10	PG&E Letter HBL-21-011, Final Status Survey Report for the Humboldt Bay Power Plant, dated July 13, 2021 (ML21194A441)	NRC Review
11	PG&E Letter, HBL-21-014, Final Status Survey Report for the Humboldt Bay Power Plant, dated August 9, 2021 (ML21221A135)	NRC Review

### **Regulatory Basis for License Termination**

NRC Regulation 10 CFR 50.82(a)(11) states:

*The Commission shall terminate the license if it determines that—*

*(i) The remaining dismantlement has been performed in accordance with the approved license termination plan, and*

*(ii) The final radiation survey and associated documentation, including an assessment of dose contributions associated with parts released for use before approval of the license termination plan, demonstrate that the facility and site have met the criteria for decommissioning in 10 CFR part 20, subpart E.*

PG&E has satisfied the criteria of 10 CFR 50.82(a)(11)(i and ii), which will allow the NRC to terminate the HBPP 10 CFR Part 50 license. Regarding 10 CFR 50.82(a)(11)(i), PG&E has completed all remaining decommissioning activities, including radioactive waste disposal, dismantlement, decontamination, and final status surveys, in accordance with the NRC approved LTP. Regarding 10 CFR 50.82(a)(11)(ii), the licensed site area has been surveyed and findings indicate that the clearance criteria of 10 CFR 20, Subpart E has been met.

### **Evaluation**

#### **Areas to be Released and FSS Results**

The remaining areas to be released consist of the licensed site area to the plant East of King Salmon Avenue. The final status surveys for this area have been completed in accordance with the LTP, confirmatory surveys have been performed

by both the NRC and its contractor, and reports for FSS areas have been submitted to the NRC for review and approval. Those reports indicate that the clearance criteria of 10 CFR 20, Subpart E has been met and once all area reports have been approved by the NRC, the HBPP Unit 3 license may be terminated.

### **Remaining Decommissioning Activities**

PG&E has completed all decommissioning and dismantlement activities required to terminate the 10 CFR Part 50 license. In accordance with 10 CFR 20.1402, a site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). PG&E has met the criteria in 10 CFR 20.1402, Radiological criteria for unrestricted use and the remainder of the HBPP site is suitable to be released for unrestricted use. Therefore, the 10 CFR Part 50 license can be terminated.

The spent nuclear fuel and greater-than-class-c (GTCC) waste remain stored onsite at the HB ISFSI licensed under 10 CFR Part 72.

### **Controls to Prevent Recontamination**

As stated above, PG&E has completed the remaining FSSs for HBPP in accordance with the NRC approved LTP. The FSS reports demonstrate that the HBPP site is well below HBPP's Derived Concentration Guideline Level (DCGLs), and therefore, there is no mechanism to re-contaminate the HBPP site due to any activities at the site. Accordingly, HBPP will continue to meet the criteria for releasing the site for unrestricted use in accordance with 10 CFR Part 20, Subpart E and the released site will continue to meet the radiological criteria for unrestricted release.

The spent nuclear fuel and GTCC waste are stored at the HB ISFSI, in the Holtec HI-STAR HB storage system. The HB ISFSI is designed to protect the stored fuel and prevent release of radioactive material under all normal, off-normal, and accident conditions of storage in accordance with all applicable regulatory requirements contained in 10 CFR 72. Chapter 8 of the HB ISFSI Updated Final Safety Analysis Report analyzes normal, off-normal, or accident conditions that would result in the release of radioactive material to areas that have been released for unrestricted use. Consequently, there is no release of radioactive material from the HB ISFSI.

### **NRC/EPA Memorandum of Understanding**

The NRC and the Environmental Protection Agency (EPA) have a memorandum of understanding (MOU), which sets forth the circumstances in which consultation with the EPA is required. The MOU identifies certain radionuclide concentrations against

which the average concentrations present at an NRC licensed site at the time of license termination are to be evaluated. These concentrations are for soil and groundwater. Attachment provides an Evaluation of Soil and Groundwater Concentrations Concerning the NRC/EPA MOU.

### **Impact of Proposed Site Release on Programs and Documents**

All the HBPP Licensing Basis Documents (LBDs) will be evaluated against the criteria in 10 CFR 50.59 and 10 CFR 72.48. The LBDs associated with the 10 CFR Part 50 license only will be cancelled upon termination of the 10 CFR Part 50 license. The LBDs that are still applicable to the HB ISFSI will be revised to reflect the termination of the Part 50 license and the remaining LBDs will reflect a stand-alone ISFSI. The following LBDs have criteria for requiring prior NRC approval beyond the criteria in 10 CFR 50.59 and 72.48:

#### *Humboldt Bay Quality Assurance Program*

PG&E maintains an NRC approved Quality Assurance Program that satisfies the requirements of 10 CFR Part 50, Appendix B. In accordance with 10 CFR 71.101(f) and 10 CFR 72.140(d), PG&E also applies this program to satisfy the Quality Assurance (QA) requirements of 10 CFR Part 71, Subpart H and 10 CFR Part 72, Subpart G.

In Reference 3, PG&E submitted for NRC approval a Quality Assurance Plan (QAP) for the HB ISFSI that satisfies the requirements of 10 CFR Part 72, Subpart G and 10 CFR Part 71, Subpart H. In Reference 4, PG&E responded to an NRC request for supplemental information regarding the QAP and informed the NRC that the QAP would be implemented upon termination of the 10 CFR Part 50 license for HBPP. In Reference 5, the NRC approved the HB ISFSI QAP.

#### *Emergency Plan*

Emergency Plan, Change 9, Revision 10, reflects the termination of the 10 CFR Part 50 license and will become effective upon termination of the 10 CFR Part 50 license. The changes to the Emergency Plan are administrative and include deleting references to 10 CFR Part 50, deleting the Part 50 EPZ, and deleting the Part 50 Emergency Action Levels. These changes do not reduce the effectiveness of the Emergency Plan and therefore, do not require prior NRC approval to implement.

#### *Physical Security Plan*

The Physical Security Plan (PSP) applies to the 10 CFR Part 72 licensed ISFSI only and is not affected by the termination of the 10 CFR Part 50 license.

## **NRC Inspections and Confirmatory Surveys**

At the request of the NRC, the Oak Ridge Institute for Science and Education (ORISE), managed by Oak Ridge Associated University (ORAU), performed confirmatory radiation surveys at the HBPP site during various NRC inspections. The last visit onsite was during August 26-29, 2019. ORISE performed independent confirmatory surveys of the remaining land areas and select buildings. The confirmatory survey activities included gamma surface scans, gamma direct measurements, alpha-plus-beta scans, alpha-only and beta-only direct measurements, smear sampling, and soil sampling within the land areas and select buildings, as applicable. The report concluded that the confirmatory survey results indicated that the areas surveyed meet the NRC approved criteria for release for unrestricted use.

## **Conclusions**

On May 4, 2016, the NRC approved the HBPP LTP and determined that the proposed DCGLs developed for soil, building surfaces, and buried and embedded piping at the site would ensure that the annual dose criterion for unrestricted release in 10 CFR 20.1402 is met (Reference 6). After the initial approval of the LTP, the NRC approved a license amendment to change the methodology from what was previously approved in the LTP for demonstrating compliance with the dose criterion in 10 CFR 20.1402, "Radiological criteria for unrestricted use" (Reference 7). The FSS Reports are consistent with the LTP and demonstrate compliance with the release criteria. The FSS results demonstrate that the survey areas to be released meet the radiological criteria for unrestricted release.

NRC inspections and confirmatory measurements verified that the decommissioning and FSS programs adequately addressed the radiological conditions at the HBPP site and the remainder of the HBPP site is suitable to be released for unrestricted use. Accordingly, the NRC should approve the termination of the HBPP 10 CFR Part 50 license.

## **References**

1. PG&E Letter HBL-16-008, "Request for Partial Release of Humboldt Bay Power Plant Unit 3 Property from the Part 50 Site," dated November 9, 2016 (ML16326A004)
2. NRC Letter to PG&E, "Humboldt Bay Power Plant Unit 3 - Request for Partial Site Release from Part 50 License (CAC No. L53153)," dated January 5, 2018 (ML17115A108 and ML17115A109)
3. PG&E Letter HIL-19-001, Humboldt Bay Independent Spent Fuel Storage Installation Quality Assurance Plan, Revision 0, dated February 14, 2019 (ML19045A700)
4. PG&E Letter HIL-19-010, Response to NRC Request for Supplemental



Information for the Humboldt Bay Independent Spent Fuel Storage  
Installation Quality Assurance Plan, dated September 3, 2019  
(ML19247E271)

5. NRC Letter, Safety Evaluation Report for the Pacific Gas and Electric Company Humboldt Bay Independent Spent Fuel Storage Installation Quality Assurance Plan HBI-L6 Revision 0 (CAC No. 001028), dated April 17, 2020 (ML20092L173)
6. NRC Letter, Humboldt Bay Power Plant Unit 3 – Issuance of Amendment RE: License Termination Plan (TAC No. J00485), dated May 4, 2016 (ML15090A339)
7. NRC Letter, Enclosure 2, Safety Evaluation by Office of Nuclear Material Safety and Safeguards Related to Amendment No. 46 to Facility Operating License No. DPR-7 Pacific Gas and Electric Company Humboldt Bay Power Plant, Unit 3 Docket No. 50-133, dated June 24, 2021 (ML21158A137)

**Evaluation of Soil and Groundwater Concentrations  
Concerning the NRC/EPA MOU**

## Background

The Environmental Protection Agency (EPA)/NRC memorandum of understanding (MOU)<sup>1</sup> contains certain radionuclide concentrations against which the average concentrations present at an NRC licensed site at the time of license termination are to be evaluated. These concentrations are for soil and groundwater. The following provides a summary of the actual concentrations for these media at the Humboldt Bay Power Plant (HBPP).

## Evaluations

### Soil

Table 1 “Nuclides of Concern at HBPP Referenced in EPA/NRC MOU Listing” contains 16 radionuclides of concern at HBPP that were listed to be assessed in the listing contained in the EPA/NRC MOU document. Although there were additional radionuclides of concern at HBPP, only those nuclides specifically identified in the EPA/NRC MOU were utilized in performing sum of fractions calculations.

**Table 1**  
**Nuclides of Concern at HBPP Referenced in**  
**EPA/NRC MOU Listing**

Radionuclide	EPA/NRC MOU Consultation Triggers For Residual Soil Contamination (pCi/g)
H-3	423
C-14	123,000
Co-60	6
Ni-59	1,230,000
Ni-63	555,000
Sr-90+Daughters	1070
Nb-94	3
Tc-99	89,400
Cs-137+Daughter	11
Eu-152	7
Eu-154	8
Pu-238	1,640
Pu-239	1,430
Pu-241	172,000
Am-241	568

<sup>1</sup> MEMORANDUM OF UNDERSTANDING BETWEEN THE ENVIRONMENTAL PROTECTION AGENCY AND THE NUCLEAR REGULATORY COMMISSION, CONSULTATION AND FINALITY ON DECOMMISSIONING AND DECONTAMINATION OF CONTAMINATED SITES

Radionuclide	EPA/NRC MOU Consultation Triggers For Residual Soil Contamination (pCi/g)
Cm-243	67

An analysis of the surface soil sample results from 61 radiological Final Status Survey (FSS) units were utilized to calculate a sum of fractions for the 16 nuclides listed in Table 1. For gamma emitters listed in Table 1, there was a statistically significant number of samples to obtain a greater than 95 percent confidence result. For non-gamma emitters, the lesser number of samples analyzed were utilized to best represent an estimate of the contribution for those nuclides. The surface soil sample results for each nuclide in each FSS unit were averaged and the average results for the 16 nuclide used to estimate the sum of fractions for the EPA/NRC MOU at HBPP. Table 2 contains the sum of fraction calculations for these 16 nuclides in the listed 61 FSS units.

**Table 2: NRC-EPA MOU Sum of Fractions for Survey Units at Humboldt Bay Power Plant Decommissioning As Left Surface Conditions**

Survey Unit	Sum of Fractions	Survey Unit	Sum of Fractions
OOL10-11 Fisherman's	1.07E-02	OOL08-06 Area W. of Bldg 25	-1.06E-02
OOL10-12 Fisherman's	1.84E-02	OOL04-01 Sump Drain Line Area	4.38E-03
NGFA-EST (HBGS)	2.51E-03	OOL10-18 New Gen. Boundary Area	1.25E-03
NGFA-WST (HBGS)	2.18E-03	OOL10-25 Decom Facility Area	2.91E-02
OOL10-04 (MEPPS area)	9.86E-03	OOL02-02 Intake Structure Area	1.87E-03
ISF01-01 (ISFSI)	-1.31E-03	OOL11-01 Intake Canal West	-2.30E-02
OOL10-05 (Circ Water)	-5.12E-03	OOL02-01 Intake Canal East	5.76E-02
OOL10-06 (60 Kv) FSS	8.55E-03	OOL06-01 Intake Canal Center	1.91E-02
OOL10-14 (Parking Lot A)	-8.77E-04	OOL01-01 Discharge Canal North	1.98E-02
OOL10-15 Buhne Slough	3.82E-02	OOL01-02 Discharge Canal Middle	2.64E-03
OOL10-23 Humboldt Bay	4.89E-03	OOL01-03 Discharge Canal South	2.42E-02
OOL10-19 Area East of Trailer City	1.05E-02	OOL07-01 Canal West Bank North	1.89E-02

Survey Unit	Sum of Fractions
NOL01-09 Caisson	-1.04E-02
OOL09-01 Discharge Canal North	2.50E-03
OOL09-02 Settling Basin	6.89E-03
OOL09-03 SMF West	7.70E-04
OOL09-04 SMF East	5.34E-03
OOL09-05 Bull Pen West	2.97E-03
OOL09-06 Bull Pen East	-8.72E-05
OOL09-07 GWTS North	8.60E-03
OOL09-08 GWTS South	6.61E-03
OOL09-09 Asbestos Area	4.10E-04
OOL09-10 Trail Buffer Zone	5.82E-03
OOL03-01 Land Area U1	2.26E-03
OOL03-02 Land Area U2	-1.09E-02
OOL08-01 Open Land Area U1	1.67E-03
OOL08-02(Bldg. 5 Footprint	1.16E-02
OOL08-03 Bldg. 26 Walkway	1.42E-02
OOL08-04 Engr Trls. S. of Bldg. 25	4.43E-03
OOL08-05 Bldg. 25 Area	4.94E-04

Survey Unit	Sum of Fractions
OOL07-02 Canal West Bank South	1.64E-02
OOL07-03 Area 51 South	-1.71E-02
OOL07-04 Area 51 North	1.57E-03
OOL05-01 Discharge Canal at Bay	-8.89E-03
OOL10-01 LFO Area	1.50E-02
OOL10-13 Coastal Trail	2.72E-02
OOL10-17 Bravo Road & Frog Pond	9.53E-03
OOL10-20 Haul Roads	2.22E-02
OOL10-22 ISFSI West	2.33E-02
OOL10-24 WMF Pad	5.64E-03
OOL10-26 Charlie Road	7.15E-03
NOL01-01 RUBB Tent Area	3.32E-02
NOL01-02 Upper Yard	-1.03E-02
NOL01-03 Upper Yard South	2.97E-03
NOL01-04 East Yard	5.95E-03
NOL01-05 North Yard	4.64E-03
NOL01-06 HMS Footprint	2.25E-03
NOL01-07 Turbine Bldgs. Footprint	-7.38E-03
NOL01-08 Balance of East Yard	1.83E-03

### *Water*

During the time of operation of HBPP, as a result of spent fuel pool leakage, concentrations of radionuclides were detected in groundwater monitoring wells. As a result, HBPP installed a liner in the spent fuel pool and maintained a level between the liner and spent fuel pool wall to prevent further leakage to the groundwater. As a result of those actions, past groundwater contamination decreased through both dilution and decay such that no HBPP related radionuclide groundwater contamination had been detected for decades before start of active decommissioning. Due to potential for cross contamination from decommissioning activities groundwater monitoring was continued during the active decommissioning until such time that primarily site restoration activities remained. During both the pre-active decommissioning during SAFSTOR and active decommissioning, no

HBPP related radionuclide groundwater contamination was identified.

## **Results**

Since all sum of fractions calculations were significantly less than 1 with a highest amount of 5.76E-02, no EPA trigger values were reached from surface soil sample analysis at HBPP. As described above, since no HBPP related nuclide contamination was detected in groundwater prior to or during active decommissioning at HBPP, no trigger value was reached for groundwater.