Pacific Gas and Electric Company®

Loren D. Sharp
Director & Plant Manager
Humboldt Bay Nuclear

Humboldt Bay Power Plant
1000 King Salmon Avenue
Eureka, CA 95503

707.444.0819
Internal: 375.0819
Fax: 707.444.0871

April 29, 2015

PG&E Letter HBL-15-006

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

Docket No. 50-133
License No. DPR-7
Humboldt Bay Power Plant Unit 3
Annual Radiological Environmental Monitoring Report for 2014

Dear Commissioners and Staff:

Enclosed is the Humboldt Bay Power Plant Unit 3, "Annual Radiological Environmental Monitoring Report" for 2014. This report provides the information required by Section 4.1 of the SAFSTOR/Decommissioning Offsite Dose Calculation Manual (ODCM).

The report has three sections. Section A provides a summary description of the SAFSTOR Radiological Environmental Monitoring Program (REMP), including maps of sampling locations. Section A also provides the results of licensee laboratory participation in the Interlaboratory Comparison Program.

Section B provides summaries, interpretations, and analyses of trends of the results of the REMP for the reporting period. The material provided is consistent with the objectives outlined in the ODCM, and in 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C. Section B also includes a comparison with the baseline environmental conditions at the beginning of SAFSTOR.

Section C provides monitoring results for the reporting period, with summaries and tabulations. Radiological environmental samples and environmental radiation measurements were taken at the locations identified in ODCM Table 2-7 as quality-related locations. The summarized results are formatted for applicable reporting requirements of the NRC Radiological Assessment Branch's Branch Technical Position.

There are no regulatory commitments made in this letter.

NMSS20

If you wish to discuss the information in the enclosed report, please contact Jim Morris at (805) 545-4609.

Sincerely,

Loren D. Sharp
Director and Plant Manager Humboldt Bay Nuclear

cc/enc: Marc L. Dapas, NRC Region IV Administrator
John B. Hickman, NRC Project Manager
HBPP Humboldt Distribution

Enclosure

Enclosure
PG&E Letter HBL-15-006

HUMBOLDT BAY POWER PLANT UNIT 3

ANNUAL RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

JANUARY 1 THROUGH DECEMBER 31, 2014

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

PACIFIC GAS AND ELECTRIC COMPANY
ANNUAL RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT FOR HUMBOLDT BAY POWER PLANT UNIT 3, COVERING THE PERIOD JANUARY 1 THROUGH DECEMBER 31, 2014

This annual report is required by Section 4.1 of the SAFSTOR Offsite Dose Calculation Manual (ODCM). This report provides information about the Radiological Environmental Monitoring Program (REMP) for the period of January 1 through December 31, 2014, in a manner consistent with the objectives outlined in the ODCM, and in 10CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

The report has three sections. Section A provides a summary description of the REMP, including maps of sampling locations. Section A also provides the results of licensee laboratory participation in the Interlaboratory Comparison Program.

Section B provides summaries, interpretations, and analyses of trends of the results of the REMP for the reporting period. The material provided is consistent with the objectives outlined in the ODCM, and in 10CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C. Section B also includes a comparison with the baseline environmental conditions at the beginning of SAFSTOR.

Section C provides the results of analyses of radiological environmental samples and of environmental radiation measurements taken during the period pursuant to the quality related locations specified in the table and figures in the ODCM, presented as both summarized and tabulated results of these analyses and measurements. The summarized results are formatted for applicable reporting requirements of the NRC Radiological Assessment Branch's Branch Technical Position.

A. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

1. Program Description

The NRC Radiological Assessment Branch issued a Branch Technical Position (BTP) on environmental monitoring in March 1978. Revision 1 of the BTP was issued as Generic Letter 79-65, "Radiological Environmental Monitoring Program Requirements – Enclosing Branch Technical Position," Revision 1, dated November 27, 1979, and sets forth an example of an acceptable minimum radiological monitoring program. The specified environmental monitoring program provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposures of individuals resulting from plant effluents.

As discussed below, many of the exposure pathway sample requirements specified in the BTP are not required for the HBPP REMP because of the baseline conditions established in the SAFSTOR Decommissioning Plan (now identified as the Post Shutdown Decommissioning Activities Report (PSDAR) and Defueled Safety Analysis Report (DSAR)) and the Environmental Report.

In addition, the nuclides specified for analysis by the BTP have been revised to reflect the available source term at a nuclear power plant that has been shut down since July 2, 1976.

The REMP consists of the collection and analysis of both onsite and offsite environmental samples. HBPP personnel perform sample collection and sample analysis of airborne radioactivity. General Engineering Laboratories (GEL) personnel perform sample analysis of ground water radioactivity. Mirion Technologies personnel perform analysis of thermoluminescent dosimeters (TLDs) used for monitoring direct radiation. A summary of the REMP is provided as Table A-1, "HBPP RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM".

Sample collection for the REMP is performed at the sampling stations defined by Table A-2, "DISTANCES AND DIRECTIONS TO HBPP OFFSITE SAMPLE LOCATIONS", Figure A-1, "HBPP ONSITE AIR SAMPLE LOCATIONS;" Figure A-2, "HBPP OFFSITE AIR SAMPLE LOCATION;" Figure A-3, "HBPP ONSITE TLD LOCATIONS", Figure A-4 "HBPP OFFSITE TLD LOCATIONS", and Figure A-5 "HBPP GROUNDWATER SAMPLE POINTS".

2. Monitoring Requirements

   a. Offsite Environmental Monitoring

      1. Airborne

         The SAFSTOR ODCM requires one (1) offsite environmental air sampling station. The air sampler is run continuously and samples are analyzed weekly for Gross Beta and Gross Alpha activity. Station 3 satisfies this requirement as shown on Figure A-2. Quarterly the composited samples are analyzed for Gamma Isotopic.

      2. Direct Radiation

         The SAFSTOR ODCM requires four (4) offsite environmental monitoring stations and one (1) offsite control station equipped with TLDs to monitor gamma exposure. The TLDs are required to be exchanged quarterly. Offsite environmental stations selected to satisfy this requirement are Stations 1, 2, 14, 25, while T17 is the offsite control station as shown on Figure A-4.. These stations are considered to represent the offsite locations for the direct radiation pathway.

3. Ingestion

The requirement to perform milk sampling was removed from the SAFSTOR ODCM Revision 24 based upon no detection of Sr-90 or plant-related gamma emitters in milk since decommissioning began.

b. Onsite Environmental Monitoring

1. Airborne

The SAFSTOR ODCM requires five (5) air sampling stations. The stations selected to satisfy this requirement are Stations AM1 through AM5 as shown on Figure A-1. The air samplers are run continuously and samples are analyzed weekly for Gross Beta and Gross Alpha activity. Quarterly the composited samples are analyzed for Gamma Isotopic, by station.

2. Direct Radiation

The SAFSTOR ODCM requires a minimum of 8 onsite environmental monitoring stations at or within the site boundary fence line, equipped with TLDs to monitor gamma exposure. TLDs are required to be exchanged quarterly. A total of 16 TLD stations are currently used to satisfy this requirement. Stations T1 through T16 are shown on Figure A-3. Four (4) additional TLDs were added around the ISFSI in 2010. These are Stations T18 through T21.

Each quarter the exposures from 20 stations are determined, which results in 80 analyses for a full year. Each TLD station has three TLDs, each containing a number of phosphors (normally three). The phosphor exposures for each TLD are averaged and then the three TLDs per station are averaged to provide the quarterly exposure for the station.

The minimum number of TLDs was modified in the ODCM from 16 to 8 stations to allow monitoring locations to be reduced as source term is removed from the site during the final phase of decommissioning.

3. Waterborne

Surface Water

Effective December 31, 2013, discharge of processed radioactive liquid effluents to Humboldt Bay was terminated. Any remaining or incidental radioactive liquids in concentrations exceeding 10 times 10 CFR 20, Appendix B, Table 2 Column 2 are manifested for disposal at a licensed landfill. Sampling and manifesting requirements are consistent with the requirements of the receiving facility and not subject to ODCM methodology. Sampling of surface water is not required by the current revision of the SAFSTOR ODCM.

Groundwater

Revision 23 of the SAFSTOR ODCM transferred ground water monitoring program requirements from the ODCM to HBPP's ground water monitoring program procedures. The number and type of required monitoring wells are specified by procedure rather than the ODCM. This was done to allow operational flexibility needed to adjust to changes to site access and hydrogeology as soils and building substructures are removed. SAPN 1290022 documented the reassignment of groundwater monitoring from the ODCM to plant procedures.

A total of fourteen (14) intermediate and deep ground water wells are included in the current groundwater monitoring initiative. Intermediate wells range in depth from 45 ft. to 69 ft. and are comprised of MW-11, RCW-SFP-1, RCW-SFP-2, RCW-SFP-3, RCW-SFP-4, RCW-SFP-5, and RCW-SFP-6. Deep ground water monitoring wells range in depth from 83 ft. to 110 ft. and include RCW-CS-3, RCW-CS-5, RCW-CS-6, RCW-CS-7, RCW-CS-8, RCW-CS-9 and RCW-CS-10. Each well was sampled on a quarterly basis. Well locations are shown on Figure A-5, "HBPP GROUNDWATER SAMPLE POINTS".

c. Other Monitoring

Airborne, ingestion and terrestrial pathway monitoring is not required by the ODCM. The Environmental Report, submitted to the NRC as Attachment 6 to SAFSTOR License Amendment Request 84-01, dated July 31, 1984, established baseline conditions for these pathways. In accordance with the NRC-approved SAFSTOR Decommissioning Plan, (now identified as the PSDAR and DSAR), these baseline conditions will only need to be reestablished prior to final decommissioning if a significant release occurs during SAFSTOR. The Environmental Report also contains a description of the demography and human activities within the environs surrounding the site.

As a matter of plant policy, groundwater leakage into the reactor caisson is routinely sampled, approximately monthly, and analyzed for tritium and gamma emitters, in order to develop a historical record of these parameters. The results are reported in Table C-6, but are not considered part of the SAFSTOR REMP.

3. Interlaboratory Comparison Program

PG&E's contract laboratory, GEL, has analyzed evaluation samples provided by a commercial supplier to satisfy the requirement to participate in an Interlaboratory Cross-Check Program. HBPP count room personnel also participated in the Eckert & Ziegler Interlaboratory Cross-Check Program. This participation includes sufficient determinations (sample medium and radionuclide combination) to ensure independent checks on the precision and accuracy of the measurements of radioactive materials in the REMP samples.

Table A-3, "GEL PARTICIPATION – INTERLABORATORY CROSS-CHECK PROGRAM DATA", and Table A-4, "HBPP PARTICIPATION – ECKERT & ZIEGLER INTERLABORATORY CROSS-CHECK PROGRAM DATA", represent analyses performed for HBPP (Table A-3) and by HBPP personnel (Table A-4). The agreement criteria are consistent with the guidance for "Confirmatory Measurements" as described in NRC Inspection Procedure 83502.03, "Radiological Environment Monitoring Program and Radioactive Material Control Program."

GEL analyzed three sets of Eckert & Ziegler Analytics samples for 23 parameters that are representative of analyses performed for HBPP during 2014. All results met the acceptance criteria. The fourth quarter Eckert & Ziegler Analytics sample data had not been reported to GEL as of the time of this report; 2014 fourth quarter results will be included in the HBPP 2015 REMP report. This will be tracked in corrective action SAPN 1401944.

HBPP analyzed four sets of Eckert & Ziegler Analytics samples for gamma in water and gamma in soil, (1^{st} quarter), gamma air filter and alpha/beta air filter (2^{nd} and 4^{th} quarters), and gamma in soil and tritium in water (3^{rd} quarter). These analyses are representative of those performed by HBPP count room personnel during 2014. All results met the acceptance criteria with the exception of the following:

- A 5-minute gross alpha count performed on one of the gas flow proportional counters did not meet the acceptance criteria with the analysis results approximately 3% low. Values used for reporting purposes were based on a 10-minute count and were acceptable. This discrepancy is documented in SAPN 1384606. The SAPN was written for tracking and trending purposes and has been closed.

- Cr-51 identified in the gamma soil cross check for the third quarter was reported as higher than the E&Z reference value for Detectors 2, 3 and 5. All results for Cs-137 and Co-60 were determined as acceptable while the Cr-51 analysis results may be considered "high" but conservative. This discrepancy is documented in SAPN 1384606. The SAPN was written for tracking and trending purposes and has been closed.

- The 2014 Radiation Protection Audit established HBPP laboratory personnel participated in an interlaboratory environmental cross check program in 2013 as prescribed by Regulatory Guide 4.15 Section 6.3.2. However, the technical process used to prescribe the contents of the cross check program was not well documented in program procedures. This discrepancy is documented in SAPN 1394360. A procedure revision was initiated as a result of the SAPN to provide more adequate documentation of cross check criteria and the SAPN status is now closed.

4. NEI Groundwater Protection Initiative

Groundwater monitoring data is collected in accordance with the Nuclear Energy Institute (NEI) Groundwater Protection Initiative. The results show that there are detectable concentrations of radionuclides in the groundwater within the HBPP restricted area. These are believed to be the results of historical spills at the site.

The impact of these detectable concentrations is negligible, because the groundwater is saline and is not used now nor likely to be used in the future for either direct consumption or for agricultural purposes.

B. TRENDS, BASELINE COMPARISONS AND INTERPRETATIONS

Section B provides interpretations of results, and analyses of trends of the results. The material provided is consistent with the objectives outlined in the ODCM, and in 10CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C. Section B also includes a comparison with the baseline environmental conditions at the beginning of SAFSTOR.

1. General Comments

The Environmental Report, submitted to the NRC as Attachment 6 to SAFSTOR License Amendment Request 84-01, established baseline conditions for soil, biota and sediments. The results to date indicate no significant change from the baseline environmental conditions established in the Environmental Report.

The results, interpretations, and analysis of trends of the results, indicate that SAFSTOR activities have had no measurable radiological effect on the environment. Facility surveys for radiation and radioactive surface contamination are performed on both a scheduled basis and on an as-required basis. These surveys indicate that the radioactivity control barriers established for SAFSTOR and decommissioning continue to be effective.

As discussed below, the ODCM calculation model conservatively assumes that exposure pathways begin at the unrestricted area boundary, also known as the owner controlled area (OCA) boundary. Since there have been no significant changes in the location of the boundary, no survey for changes to the use of unrestricted areas was necessary.

2. Direct Radiation Pathway

A plot of the radiation level trends for the five (offsite) locations is shown in Figure B-1, "OFFSITE ENVIRONMENTAL RADIATION LEVEL TRENDS." A plot of the radiation level trends for onsite stations is shown in Figure B-2, "ONSITE ENVIRONMENTAL RADIATION LEVEL TRENDS." The plots show that the offsite annual doses continue to be within the ranges that have been observed over the last ten years.

HBPP changed TLD processing services beginning in January 2014. Data from previous years was based on a Panasonic TLD system. Data in 2014 is based on Mirion Genesis type TLD system. The apparent rise in Figures B-1 and B-2 may partially be a result of the change in monitoring devices.

Figure B-2 includes the average dose for two groups of onsite stations, selected by their potential to be affected by radioactive waste handling activities. Figure B-2 also shows that dose measurement variations can be attributed to in-plant sources and low-level waste packaging and shipping activities. However, allowing for the background change in the general environs, all measurements were comparable to the ranges observed at these locations since entering SAFSTOR, with the onsite station dose levels approximately within the range of dose levels shown by the offsite stations.

The ODCM calculation model for the direct radiation exposure pathway assumes an occupancy factor for the portion of the unrestricted area boundary that is closest to the radioactive waste handling area of the plant, (TLDs T5-T8), which is the location of the highest potential exposure. The occupancy factor is 67 hours per year, based on regulatory guidance for shoreline recreation, even though the actual shoreline is farther from the boundary. Since there have been no significant changes of the locations of the radioactive waste handling activities, boundary, or shoreline, no further survey for changes to the use of unrestricted areas is necessary. Using the maximum yearly dose, as seen on TLDs T5-T8 and corrected to the 67 hour occupancy, and subtracting the average of the five (5) offsite TLDs, the dose to the maximum exposed individual from this source was indistinguishable from background.

The Independent Spent Fuel Storage Installation (ISFSI) was constructed in 2008, and spent fuel transfer from the spent fuel pool (SFP) was completed in December 2008. As a result of this, the dose rates at the OCA fence line increased slightly. The ISFSI Final Safety Analysis Report (FSAR) assumes an occupancy factor of 2,080 hours per year at the OCA fence line. Using the maximum yearly dose, as seen on TLDs T18-T21 and corrected to the 2080 hour occupancy, and subtracting the average of the five (5) offsite control TLDs, the dose to the maximum exposed individual from this source would be 1.85 mRem per year.

3. Airborne Pathway

Airborne pathway monitoring is not required by the ODCM. The Environmental Report, submitted to the NRC as Attachment 6 to SAFSTOR License Amendment Request 84-01, established baseline conditions for the airborne pathway. In accordance with the NRC-approved SAFSTOR Decommissioning Plan, (now identified as the PSDAR and DSAR), these baseline conditions will only need to be reestablished prior to final decommissioning if a significant release occurs during SAFSTOR. The ODCM calculation model for the airborne pathway assumes that the airborne exposure pathway (inhalation exposure) is at the unrestricted area boundary, which is the location of the highest potential exposure.

4. Waterborne Pathway

a. Surface Water

The original Liquid Radwaste Treatment System has been dismantled and removed. Radioactive water associated with the Spent Fuel Pool is processed using the filtered ion exchange system and liquid radioactive wastes are treated by an offsite waste processor or shipped for disposal at a regulated disposal facility. Discharges of liquid radioactive effluent to Humboldt Bay were eliminated after December 2013.

b. Groundwater

None of the samples of the fourteen (14) SAFSTOR REMP monitoring wells indicated detectable levels of tritium. For gamma radioactivity, sample results were typical of those observed since entering SAFSTOR. Results for other parameters and samples were comparable to the ranges observed since entering SAFSTOR.

This report also contains information on gamma emitting radionuclides and tritium concentrations in the Caisson Sump and gamma emitting radionuclide concentrations for the SFP French Drain. There is detectable radioactivity, due to plant operations, at these sample points. Both of these locations are believed to be contaminated as a result of groundwater intrusion into historically contaminated areas of concrete and fill material.

The ODCM does not provide a model for the groundwater waterborne pathway, because the groundwater is saline and is not used now nor likely to be used in the future for either direct consumption or for agricultural purposes.

5. Ingestion Pathway

Ingestion pathway monitoring is not required by the ODCM. The Environmental Report, submitted to the NRC as Attachment 6 to SAFSTOR License Amendment Request 84-01, established baseline conditions for the ingestion pathway. In accordance with the NRC-approved SAFSTOR Decommissioning Plan, (now identified as the PSDAR and DSAR), these baseline conditions will only need to be reestablished prior to final decommissioning if a significant release occurs during SAFSTOR.

The ODCM calculation model for the airborne pathway assumes that the ingestion pathways (milk, meat and vegetable consumption) begin at the unrestricted area boundary, which is the location of the highest potential exposure, whether any dairy, farm, etc. is actually present.

6. Terrestrial Pathway

Terrestrial pathway monitoring is not required by the ODCM. The Environmental Report, submitted to the NRC as Attachment 6 to SAFSTOR License Amendment Request 84-01, established baseline conditions for the terrestrial pathway. In accordance with the NRC-approved SAFSTOR Decommissioning Plan, (now identified as the PSDAR and DSAR), these baseline conditions will only need to be reestablished prior to final decommissioning if a significant release occurs during SAFSTOR.

The ODCM calculation model for the terrestrial pathway conservatively assumes that the terrestrial exposure (direct radiation from airborne radioactivity deposition) is at the unrestricted area boundary, which is the location of the highest potential exposure.

C. MONITORING RESULTS

1. Annual Summary

Results of the REMP sampling and analysis are summarized in Table C-1 in the format of the BTP Table 3. None of the REMP samples results exceeded the reporting levels for radioactivity concentration in environmental samples specified in HBPP ODCM Table 2-8.

All of the minimum detectable activities (MDAs) for analyses required by the SAFSTOR REMP were less than or equal to the lower limit of detection (LLD) criteria for radioactivity in environmental samples specified in Table C-1 of this report, with one exception. The air sample pump located at Humboldt Hill was found powered off after running approximately 23 hours and 49 minutes on 4/25/2014. The beta MDA was determined to be 4.28E-02 pCi/m^3 instead of the required 1.0E-02 pCi/m^3.

Because alpha and beta radioactivity analyses of the saline ground water are less effective than tritium and gamma radioactivity analyses for monitoring potential SFP leakage, the ODCM does not currently require alpha and beta radioactivity analyses in water to be part of the SAFSTOR REMP.

2. Direct Radiation Pathway

Monitoring of the direct radiation pathway is performed at 20 onsite locations near the OCA fence line, and at four offsite environmental monitoring stations and one offsite (control) location (Location number T17) in the vicinity of the facility. Monitoring is performed with TLDs with multiple crystal elements. Three TLDs are installed at each station, and the set is exchanged quarterly. The reported result and its standard error are calculated from the measurements of multiple elements in the TLD triplet. Results of the onsite and offsite monitoring are provided in Tables C-2 and C-3, respectively.

TLD station T9 was moved approximately 10 ft. further away from the Discharge Canal on 9/15/2014. The TLD was relocated to prevent impeding future truck/vehicular traffic during demolition activities. Corrective action SAPN 1393975 describes the relocation and new GPS coordinates. Figures A-3 has been updated to reflect the change in location.

3. Airborne Pathway

Five onsite samples and one offsite sample were collected and analyzed weekly for Gross Beta and Gross Alpha activity, with the following exception: Humboldt Hill collected on 4/25/2014. The air sampler was found powered off after running for only 23 hours and 49 minutes, based on the instrument timer reading. The failure to provide continuous offsite air sample monitoring was described in corrective action SAPN 1388096. SAPN status is now closed.

The required quarterly composited samples were analyzed for Gamma Isotopic by station. All air sample results for alpha and beta activity, and quarterly composite results for Co-60 and Cs-137 are provided in Table C-7.

All LLD's were met for Gross Beta (required LLD 1.0E-02 pCi/m^3) and Cs-137 (required LLD of 6.0E-02 pCi/m^3). The only exception was the air sample taken from Humboldt Hill. The air sampler was discovered powered off after running only 23 hours and 49 minutes. The beta MDA was determined to be 4.28E-02 pCi/m^3 instead of the required 1.0E-02 pCi/m^3.

4. Waterborne Pathway

a. Surface Water

Surface water sampling of the waterborne pathway is no longer performed due to the termination of liquid effluent releases in December 2013.

b. Groundwater

Groundwater sampling of the waterborne pathway is performed by sampling fourteen (14) monitoring wells located to monitor for leakage from the SFP. Sampling of these monitoring wells is performed quarterly in accordance with plant procedures.

The ground water monitoring program requirements were transferred from the ODCM to HBPP's ground water monitoring program procedures. The number and type of required monitoring wells are specified by procedure rather than the ODCM to allow operational flexibility needed to adjust to changes to the site during decommissioning and demolition activities. Ground water results will continue to be reported in the annual REMP report. Detailed results of groundwater monitoring are provided in Table C-4.

The tritium concentration for all of the wells listed in Table C-4 during 2014 was less than the MDA of approximately 300 pCi/liter. All of the monitoring

wells are inside the OCA boundary, and the groundwater is saline and is not used now nor likely to be used in the future for either direct consumption or for agricultural purposes. Therefore, there is no groundwater waterborne pathway for a member of the public. None of the other ODCM required REMP samples indicated detectable levels of tritium or gamma radioactivity.

Because alpha and beta radioactivity analyses of the saline groundwater are less effective than tritium and gamma radioactivity analyses for monitoring potential SFP leakage, plant procedures do not currently require alpha and beta radioactivity analyses to be part of the SAFSTOR REMP. Nevertheless, alpha and beta radioactivity analyses are performed as a matter of plant policy, in order to maintain a historical record of this parameter for the remainder of SAFSTOR. These results are included in Table C-4, but are not considered part of the SAFSTOR REMP.

All required sampling and analysis for the monitoring wells of the waterborne pathway required during this reporting period were performed successfully. During the second quarterly ground water monitoring well event, monitoring wells RCW-SFP-3, RW-CS-5, RCW-CS-6 and RCW-CS-7 were detected as containing sediments that required removal. Well maintenance to remove accumulated sediments in RCW-SFP-3, RCW-SFP-5, RCW-CS-6 and RCW-CS-7 was successfully completed on 9/3/2014. RW-CS-5 was inaccessible at that time due to demolition activities in the close proximity. Flushing of sediments from RW-CS-5 was accomplished on 2/18/2015. These actions have been documented in corrective action SAPN 1388694.

Groundwater leakage into the reactor caisson is also routinely sampled, approximately monthly, and analyzed for gamma emitters and tritium as a matter of plant policy, in order to develop a historical record of these parameters for SAFSTOR and decommissioning. These results are included in Table C-5, but are not considered part of the SAFSTOR REMP.

The french drain beneath the SFP is also routinely sampled, approximately monthly, and analyzed for gamma emitters as a matter of plant policy, in order to develop a historical record of this parameter for SAFSTOR and decommissioning. These results are included in Table C-6, but are not considered part of the SAFSTOR REMP.

5. Ingestion Pathway

Ingestion pathway monitoring is not required by the ODCM.

6. Terrestrial Pathway

Terrestrial pathway monitoring is not required by the ODCM.

7. NEI Groundwater Protection Initiative Voluntary Reporting Results

The NEI Groundwater Protection Initiative contains the following requirements:

OBJECTIVE 2.2 VOLUNTARY COMMUNICATION

Make informal notification as soon as practicable to appropriate State/Local officials, with follow up notification to the NRC, as appropriate, regarding significant onsite leaks/spills into groundwater and onsite or offsite water sample results exceeding the criteria in the REMP as described in the ODCM/ODAM.

HBPP Response to 2.2:

There were no reports or notifications required to be generated in 2014 for groundwater results exceeding reporting/notification levels or significant onsite leaks/spills.

OBJECTIVE 2.3 THIRTY-DAY REPORTS

Submit a 30-day report to the NRC for any water sample result for onsite groundwater that is or may be used as a source of drinking water that exceeds the criteria in the licensee's existing REMP for 30-day reporting of offsite water sample results. Copies of 30-day reports for both onsite and offsite water samples will also be provided to the appropriate State agency, and:

HBPP Response to 2.3:

There were no reports or notifications required to be generated in 2014 for groundwater results exceeding reporting/notification levels or significant onsite leaks/spills.

OBJECTIVE 2.4 ANNUAL REPORTING

Document all on-site ground water sample results and a description of any significant on-site leaks/spills into groundwater for each calendar year in the AREOR for REMP or the ARERR for the RETS as contained in the appropriate reporting procedure, beginning with Calendar year 2006.

HBPP Response to 2.4:

Onsite groundwater monitoring points are described and reported in this report as follows: MW-11, RCW-SFP-1, RCW-SFP-2, RCW-SFP-3, RCW-SFP-4, RCW-SFP-5, RCW-SFP-6, RCW-CS-3, RCW-CS-5, RCW-CS-6, RCW-CS-7, RCW-CS-8, RCW-CS-9, RCW-CS-10, the caisson sump and the french drain. A summary of the sample results are provided in Section C.

There were no significant onsite leaks/spills into groundwater in 2014.

Note: the term "significant" is defined by the NEI Initiative as greater than 100 gallons.

8. Errata for Previous Years' Reports

None.

TABLE A-1
HBPP RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway And/Or Sample	Number of Samples And Locations	Sampling and Collection Frequency	Type of Analysis
AIRBORNE	5 onsite locations, 1 offsite location	Continuous sampler operation with sample collection at least once per 7 days	Gross alpha and Gross beta radioactivity following filter change. Gamma Isotopic[(a)] analysis on quarterly composite (by station).
DIRECT RADIATION	20 onsite stations with TLDs	TLDs exchanged quarterly	Gamma exposure
	5 offsite stations with TLDs	TLDs exchanged quarterly	Gamma exposure
WATERBORNE			
Groundwater	14 monitoring wells	Quarterly	Gross alpha and Gross beta radioactivity, Tritium and Gamma Isotopic[(a)] analysis.

[(a)] Gamma isotopic analysis means the identification and quantification of gamma emitting radionuclides that may be attributable to the effluents from the facility.

TABLE A-2
DISTANCES AND DIRECTIONS TO HBPP OFFSITE SAMPLE LOCATIONS

Station Number	Offsite Measurement Pathway	Station Name	Radial Direction		Radial Distance From Plant (Miles)
			Sector	By Degrees	
3	Airborne	Humboldt Hill	SSE	158	0.9
1	Direct Radiation	King Salmon Picnic Area	W	270	0.3
2	Direct Radiation	City of Fortuna Water Pollution Control Plant, 180 Dinsmore Drive, Fortuna	SSE	158	9.4
14	Direct Radiation	South Bay School Parking Lot	S	180	0.4
25	Direct Radiation	Irving Drive, Humboldt Hill	SSE	175	1.3
T17	Direct Radiation	Mitchell Heights Drive	NNE	45	6.0

TABLE A-3
GEL PARTICIPATION – INTERLABORATORY CROSS-CHECK PROGRAM D

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	GEL Value (pCi/L)	Reference Value (pCi/L)
Gamma Water	I-131	E10849	1st	5/16/2014	9.24E+01	8.99E+01
	Ce-141	E10849	1st	5/16/2014	8.19E+01	7.71E+01
	Cr-51	E10849	1st	5/16/2014	3.32E+02	3.19E+02
	Cs-134	E10849	1st	5/16/2014	1.27E+02	1.36E+02
	Cs-137	E10849	1st	5/16/2014	1.69E+02	1.64E+02
	Co-58	E10849	1st	5/16/2014	1.75E+02	1.74E+02
	Mn-54	E10849	1st	5/16/2014	2.08E+02	1.93E+02
	Fe-59	E10849	1st	5/16/2014	1.68E+02	1.42E+02
	Zn-65	E10849	1st	5/16/2014	2.25E+02	2.10E+02
	Co-60	E10849	1st	5/16/2014	2.31E+02	2.19E+02
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**GEL Value (pCi/L)**	**Reference Value (pCi/L)**
Milk	Sr-89	E10847	1st	5/16/2014	9.14E+01	9.17E+01
	Sr-90	E10847	1st	5/16/2014	1.27E+01	1.51E+01
	I-131	E10848	1st	5/16/2014	9.84E+01	9.85E+01
	Ce-141	E10848	1st	5/16/2014	1.21E+02	1.19E+02
	Cr-51	E10848	1st	5/16/2014	5.19E+02	4.91E+02
	Cs-134	E10848	1st	5/16/2014	1.79E+02	2.10E+02
	Cs-137	E10848	1st	5/16/2014	2.55E+02	2.53E+02
	Co-58	E10848	1st	5/16/2014	2.58E+02	2.68E+02
	Mn-54	E10848	1st	5/16/2014	3.01E+02	2.97E+02
	Fe-59	E10848	1st	5/16/2014	2.24E+02	2.19E+02
	Zn-65	E10848	1st	5/16/2014	3.45E+02	3.23E+02
	Co-60	E10848	1st	5/16/2014	3.39E+02	3.37E+02
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**GEL Value (pCi)**	**Reference Value (pCi)**
Cartridge	I-131	E10846	1st	5/16/2014	7.83E+01	7.52E+01

TABLE A-3 (Continued)
GEL PARTICIPATION – INTERLABORATORY CROSS-CHECK PROGRAM DATA

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	GEL Value (pCi/L)	Reference Value (pCi/L)	Ratio	Evaluation
Gamma Water	I-131	E10900	2nd	8/8/2014	1.13E+02	9.83E+01	1.15	Acceptable
	Ce-141	E10900	2nd	8/8/2014	1.52E+02	1.43E+02	1.06	Acceptable
	Cr-51	E10900	2nd	8/8/2014	3.62E+02	2.94E+02	1.23	Acceptable
	Cs-134	E10900	2nd	8/8/2014	1.69E+02	1.88E+02	0.90	Acceptable
	Cs-137	E10900	2nd	8/8/2014	1.48E+02	1.39E+02	1.06	Acceptable
	Co-58	E10900	2nd	8/8/2014	1.34E+02	1.30E+02	1.03	Acceptable
	Mn-54	E10900	2nd	8/8/2014	1.88E+02	1.80E+02	1.04	Acceptable
	Fe-59	E10900	2nd	8/8/2014	1.29E+02	1.19E+02	1.09	Acceptable
	Zn-65	E10900	2nd	8/8/2014	3.29E+02	2.93E+02	1.12	Acceptable
	Co-60	E10900	2nd	8/8/2014	2.74E+02	2.60E+02	1.05	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**GEL Value (pCi/L)**	**Reference Value (pCi/L)**	**Ratio**	**Evaluation**
Milk	Sr-89	E10898	2nd	8/8/2014	9.84E+01	9.13E+01	1.08	Acceptable
	Sr-90	E10898	2nd	8/8/2014	1.44E+01	1.45E+01	0.99	Acceptable
	I-131	E10899	2nd	8/8/2014	9.89E+01	9.09E+01	1.09	Acceptable
	Ce-141	E10899	2nd	8/8/2014	1.38E+02	1.24E+02	1.12	Acceptable
	Cr-51	E10899	2nd	8/8/2014	2.68E+02	2.53E+02	1.06	Acceptable
	Cs-134	E10899	2nd	8/8/2014	1.58E+02	1.62E+02	0.97	Acceptable
	Cs-137	E10899	2nd	8/8/2014	1.27E+02	1.20E+02	1.06	Acceptable
	Co-58	E10899	2nd	8/8/2014	1.20E+02	1.12E+02	1.07	Acceptable
	Mn-54	E10899	2nd	8/8/2014	1.67E+02	1.56E+02	1.07	Acceptable
	Fe-59	E10899	2nd	8/8/2014	1.02E+02	1.02E+02	1.00	Acceptable
	Zn-65	E10899	2nd	8/8/2014	2.68E+02	2.52E+02	1.06	Acceptable
	Co-60	E10899	2nd	8/8/2014	2.42E+02	2.24E+02	1.08	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**GEL Value (pCi)**	**Reference Value (pCi)**	**Ratio**	**Evaluation**
Cartridge	I-131	E10897	2nd	8/8/2014	8.73E+01	8.54E+01	1.02	Acceptable

TABLE A-3 (Continued)
GEL PARTICIPATION – INTERLABORATORY CROSS-CHECK PROGRAM DATA

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	GEL Value (pCi/L)	Reference Value (pCi/L)	Ratio	Evaluation
Gamma Water	I-131	E10996	3rd	11/22/2014	1.02E+02	9.88E+01	1.03	Acceptable
	Ce-141	E10996	3rd	11/22/2014	1.30E+02	1.25E+02	1.04	Acceptable
	Cr-51	E10996	3rd	11/22/2014	2.75E+02	2.86E+02	0.96	Acceptable
	Cs-134	E10996	3rd	11/22/2014	1.45E+02	1.56E+02	0.93	Acceptable
	Cs-137	E10996	3rd	11/22/2014	1.94E+02	1.92E+02	1.01	Acceptable
	Co-58	E10996	3rd	11/22/2014	1.43E+02	1.42E+02	1.01	Acceptable
	Mn-54	E10996	3rd	11/22/2014	1.46E+02	1.41E+02	1.04	Acceptable
	Fe-59	E10996	3rd	11/22/2014	1.66E+02	1.57E+02	1.06	Acceptable
	Zn-65	E10996	3rd	11/22/2014	7.55E+01	7.24E+01	1.04	Acceptable
	Co-60	E10996	3rd	11/22/2014	3.09E+02	2.95E+02	1.05	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**GEL Value (pCi/L)**	**Reference Value (pCi/L)**	**Ratio**	**Evaluation**
Milk	Sr-89	E10994	3rd	11/22/2014	9.73E+01	9.69E+01	1	Acceptable
	Sr-90	E10994	3rd	11/22/2014	1.31E+01	1.64E+01	0.80	Acceptable
	I-131	E10995	3rd	11/22/2014	1.04E+02	9.76E+01	1.07	Acceptable
	Ce-141	E10995	3rd	11/22/2014	1.28E+02	1.26E+02	1.01	Acceptable
	Cr-51	E10995	3rd	11/22/2014	3.12E+02	2.88E+02	1.08	Acceptable
	Cs-134	E10995	3rd	11/22/2014	1.51E+02	1.58E+02	0.96	Acceptable
	Cs-137	E10995	3rd	11/22/2014	2.03E+02	1.93E+02	1.05	Acceptable
	Co-58	E10995	3rd	11/22/2014	1.44E+02	1.43E+02	1.01	Acceptable
	Mn-54	E10995	3rd	11/22/2014	1.49E+02	1.42E+02	1.05	Acceptable
	Fe-59	E10995	3rd	11/22/2014	1.82E+02	1.58E+02	1.15	Acceptable
	Zn-65	E10995	3rd	11/22/2014	7.41E+01	7.30E+01	1.01	Acceptable
	Co-60	E10995	3rd	11/22/2014	3.14E+02	2.94E+02	1.06	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**GEL Value (pCi)**	**Reference Value (pCi)**	**Ratio**	**Evaluation**
Cartridge	I-131	E10993	3rd	11/22/2014	9.47E+01	8.99E+01	1.05	Acceptable

NOTE: 2014 fourth quarter interlaboratory cross-check program data between GEL and Eckert & Ziegler had not been received by GEL as of the date of this report. 2014 fourth quarter data will be included in the 2015 REMP report.

TABLE A-4
HBPP PARTICIPATION – ECKERT & ZIEGLER INTERLABORATORY CROSS-CHECK PROGRAM DATA

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	HBPP Count Room (pCi/L)	Reference Value (pCi/L)	Ratio	Evaluation
Gamma Water	Ce-141	E10805	1st	4/2/2014	8.02E+01	7.71E+01	1.04	Acceptable
	Cr-51	E10805	1st	4/2/2014	3.33E+02	3.19E+02	1.05	Acceptable
	Cs-134	E10805	1st	4/2/2014	1.23E+02	1.36E+02	0.90	Acceptable
	Cs-137	E10805	1st	4/2/2014	1.67E+02	1.64E+02	1.02	Acceptable
	Co-58	E10805	1st	4/2/2014	1.66E+02	1.74E+02	0.96	Acceptable
	Mn-54	E10805	1st	4/2/2014	1.94E+02	1.93E+02	1.01	Acceptable
	Fe-59	E10805	1st	4/2/2014	1.29E+02	1.42E+02	0.91	Acceptable
	Zn-65	E10805	1st	4/2/2014	2.00E+02	2.10E+02	0.95	Acceptable
	Co-60	E10805	1st	4/2/2014	2.17E+02	2.19E+02	0.99	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**HBPP Count Room (pCi/g)**	**Reference Value (pCi/g)**	**Ratio**	**Evaluation**
Gamma Soil	Ce-141	E10806	1st	4/2/2014	1.84E-01	1.74E-01	1.06	Acceptable
	Cr-51	E10806	1st	4/2/2014	7.29E-01	7.18E-01	1.02	Acceptable
	Cs-134	E10806	1st	4/2/2014	3.09E-01	3.07E-01	1.01	Acceptable
	Cs-137	E10806	1st	4/2/2014	4.31E-01	4.51E-01	0.95	Acceptable
	Co-58	E10806	1st	4/2/2014	4.15E-01	3.92E-01	1.06	Acceptable
	Mn-54	E10806	1st	4/2/2014	4.48E-01	4.35E-01	1.03	Acceptable
	Fe-59	E10806	1st	4/2/2014	3.35E-01	3.20E-01	1.05	Acceptable
	Zn-65	E10806	1st	4/2/2014	4.96E-01	4.72E-01	1.05	Acceptable
	Co-60	E10806	1st	4/2/2014	4.84E-01	4.93E-01	0.98	Acceptable

TABLE A-4 (Continued)
HBPP PARTICIPATION – ECKERT & ZIEGLER INTERLABORATORY CROSS-CHECK PROGRAM DATA

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	HBPP Count Room (pCi)	Reference Value (pCi)	Ratio	Evaluation
Gamma Filter	Ce-141	E10933	2nd	7/11/2014	9.43E+01	8.70E+01	1.08	Acceptable
	Cr-51	E10933	2nd	7/11/2014	1.69E+02	1.78E+02	0.95	Acceptable
	Cs-134	E10933	2nd	7/11/2014	1.03E+02	1.14E+02	0.90	Acceptable
	Cs-137	E10933	2nd	7/11/2014	9.04E+01	8.43E+01	1.07	Acceptable
	Co-58	E10933	2nd	7/11/2014	8.18E+01	7.89E+01	1.04	Acceptable
	Mn-54	E10933	2nd	7/11/2014	1.23E+02	1.09E+02	1.12	Acceptable
	Fe-59	E10933	2nd	7/11/2014	7.87E+01	7.20E+01	1.09	Acceptable
	Zn-65	E10933	2nd	7/11/2014	1.83E+02	1.77E+02	1.03	Acceptable
	Co-60	E10933	2nd	7/11/2014	1.62E+02	1.58E+02	1.03	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**HBPP Count Room (pCi)**	**Reference Value (pCi)**	**Ratio**	**Evaluation**
Alpha/Beta Filter	Alpha	E10934	2nd	7/11/2014	3.28E+01	3.74E+01	0.88	Acceptable[1]
	Beta	E10934	2nd	7/11/2014	2.03E+02	2.01E+02	1.01	Acceptable

Table A-4 Notes:

[1]Analysis results based on 10 minute count times for alpha and beta analysis on Protean SN 7109. Alpha filter cross checks normally performed on each Protean gas flow proportional counter at count times of 5 minutes, 10 minutes and 20 minutes for gross alpha. Beta filter cross checks normally performed on each Protean gas flow proportional counter at count times of 5 minutes and 10 minutes. The 5-minute gross alpha count performed on Protean SN 7109 did not meet the acceptance criteria as the analysis results appeared to be approximately 3% low. This discrepancy is documented in SAPN 1384606.

TABLE A-4 (Continued)
HBPP PARTICIPATION – ECKERT & ZIEGLER INTERLABORATORY CROSS-CHECK PROGRAM DATA

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	HBPP Count Room (pCi/g)	Reference Value (pCi/g)	Ratio	Evaluation
Gamma Soil	Ce-141	E11008	3rd	10/21/2014	2.00E-01	1.86E-01	1.08	Acceptable
	Cr-51	E11008	3rd	10/21/2014	5.11E-01	4.25E-01	1.20	Not Acceptable[2]
	Cs-134	E11008	3rd	10/21/2014	2.35E-01	2.33E-01	1.01	Acceptable
	Cs-137	E11008	3rd	10/21/2014	3.86E-01	3.65E-01	1.06	Acceptable
	Co-58	E11008	3rd	10/21/2014	2.05E-01	2.11E-01	0.97	Acceptable
	Mn-54	E11008	3rd	10/21/2014	2.34E-01	2.09E-01	1.12	Acceptable
	Fe-59	E11008	3rd	10/21/2014	2.48E-01	2.33E-01	1.07	Acceptable
	Zn-65	E11008	3rd	10/21/2014	1.02E-01	1.08E-01	0.95	Acceptable
	Co-60	E11008	3rd	10/21/2014	4.479-01	4.38E-01	1.02	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**HBPP Count Room (pCi/L)**	**Reference Value (pCi/L)**	**Ratio**	**Evaluation**
Tritium Water	H-3	E11009	3rd	10/21/2014	9.97E+03	9.85E+03	1.01	Acceptable

Table A-4 Notes:

[2]Cross checks for the third quarter were received on 9/10/2014 but not analyzed until 9/25/2014 due to work load constraints. Cr-51 has a 27.7 day half-life. Detectors 2, 3 and 5 displayed higher activities for Cr-51 than the E&Z reference value. Cr has one gamma line at 320.1 keV and at 0.425 pCi/g in soil; the Cr-51 nuclide in the cross check sample is only slightly above the system MDA. Cr-51 results for Detectors 2, 3 and 5 were reported as higher than the reference value, making the analysis decision conservative. Primary gamma radionuclides of concern for HBPP are Cs-137 at 661.66 keV (30.07 year half-life), Am-241 at 59.3 keV (432.2 year half-life) and Co-60 at 1173.2 and 1332.5 keV (5.27 year half-life). Short-lived radionuclides are no longer present following the plant's shutdown in 1976. Cr-51's one gamma line falls at a location on the efficiency curve where identification of expected HBPP radionuclides is not anticipated. All results for Cs-137 and Co-60 were determined as acceptable while the Cr-51 analysis results may be considered "high" but conservative. This discrepancy is documented in SAPN 1384606.

TABLE A-4 (Continued)
HBPP PARTICIPATION – ECKERT & ZIEGLER INTERLABORATORY CROSS-CHECK PROGRAM DATA

Sample/ Analysis	Radionuclide	Sample Number	Quarter 2014	Report Date	HBPP Count Room (pCi)	Reference Value (pCi)	Ratio	Evaluation
Gamma Filter	Ce-141	E11076	4th	12/18/2014	1.08E+02	1.07E+02	1.01	Acceptable
	Cr-51	E11076	4th	12/18/2014	1.94E+02	1.98E+02	0.98	Acceptable
	Cs-134	E11076	4th	12/18/2014	7.13E+01	8.02E+01	0.89	Acceptable
	Cs-137	E11076	4th	12/18/2014	9.50E+01	9.65E+01	0.98	Acceptable
	Co-58	E11076	4th	12/18/2014	6.08E+01	6.34E+01	0.96	Acceptable
	Mn-54	E11076	4th	12/18/2014	1.14E+02	1.10E+02	1.04	Acceptable
	Fe-59	E11076	4th	12/18/2014	8.70E+01	8.51E+01	1.02	Acceptable
	Zn-65	E11076	4th	12/18/2014	1.60E+02	1.45E+02	1.11	Acceptable
	Co-60	E11076	4th	12/18/2014	1.14E+02	1.15E+02	1.00	Acceptable
Sample/ Analysis	**Radionuclide**	**Sample Number**	**Quarter 2014**	**Report Date**	**HBPP Count Room (pCi)**	**Reference Value (pCi)**	**Ratio**	**Evaluation**
Alpha/Beta Filter	Alpha	E11077	4th	12/18/2014	7.64E+01	7.13E+01	1.07	Acceptable
	Beta	E11077	4th	12/18/2014	2.47E+02	2.37E+02	1.04	Acceptable

TABLE C-1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL REPORT SUMMARY

Name of Facility: Humboldt Bay Power Plant Unit 3 | Docket No.: 50-133; License No. DPR-7

Location of Facility: Humboldt County, California (County, State) | Reporting Period: January 1 – December 31, 2014

Medium or Pathway Sampled [Unit of Measurement]	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations	Location with Highest Annual Mean		Control Locations	Number of Non-routine Reported Measure-ments
			Mean,(Fraction), & [Range][b]	Name	Mean, (Fraction) & [Range][b]	Mean, (Fraction) & [Range][b]	
AIRBORNE Particulates [pCi/m3]	(52) samples per station • Gross Beta, • Gross Alpha • Gamma Isotopic analysis on quarterly composite (by station) (5) Onsite Locations (1) Offsite Locations	• Gross Beta 1.00E-02 pCi/m3 • Gamma Isotopic analysis on quarterly composite (by station) • Cs-137 6.00E-02 pCi/m3	**East Fence (AM1)** Gross Alpha (pCi/m3) mean 2.79E-03, (9/52), [2.02E-03 to 3.56E-03] Gross Beta (pCi/m3) mean 1.22E-02, (46/52), [3.51E-03 to 3.76E-02] **Building 12 (AM2)** Gross Alpha (pCi/m3) mean 2.93E-03, (10/52), [2.38E-03 to 4.28E-03] Gross Beta (pCi/m3) mean 1.19E-02, (48/52), [3.55E-03 to 3.87E-02] **Annex (AM3)** Gross Alpha (pCi/m3) mean 3.10E-03, (4/52), [2.38E-03 to 4.15E-03] Gross Beta (pCi/m3) mean 1.04E-02, (44/52), [3.47E-03 to 3.39E-02] **Relay Building (AM4)** Gross Alpha (pCi/m3) mean 2.97E-03, (6/52), [2.36E-03 to 4.76E-03] Gross Beta (pCi/m3) mean 1.13E-02, (40/52), [4.24E-03 to 3.28E-02] **Oil Water Separator (OWS – AM5)** Gross Alpha (pCi/m3) mean 2.71E-03, (7/52), [2.34E-03 to 3.04E-03] Gross Beta (pCi/m3) mean 1.13E-02, (47/52), [4.14E-03 to 3.73E-02]	**Annex** **East Fence**	Gross Alpha (pCi/m3) mean 3.10E-03, (4/52), [2.38E-03 to 4.15E-03] Gross Beta (pCi/m3) mean 1.22E-02, (46/52), [3.51E-03 to 3.76E-02] Cs-137 <MDA	**Humboldt Hill (Station 3)** Gross Alpha (pCi/m3) mean 2.38E-03, (3/52), [2.36E-03 to 2.43E-03] Gross Beta (pCi/m3) mean 1.04E-02, (34/52), [3.47E-03 to 2.77E-02]	N/A
DIRECT RADIATION [mR/quarter]	(80) Fence line TLD readings (20) Off-site TLD Readings	**5 mRem**	**Fence Line TLDs (T1 to T16 and T18 to T21)** **14.4 ± 0.1, (80/80), [12.3 to 16.4]**	**Station T-19, Figure B-1**	**T19 (mR/qtr) mean 15.7 ± 0.4, (1/4), [15.2 to 16.4]**	**Stations 1, 2, 14, 25 and T17 (mR/qtr) mean 13.9 ± 0.1, (20/20), [13.0-16.1]**	0

TABLE C-1 (Continued)
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL REPORT SUMMARY

Medium or Pathway Sampled [Unit of Measurement]	Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations	Location with Highest Annual Mean		Control Locations	Number of Non-routine Reported Measurements
			Mean, (Fraction) & [Range][b]	Name, Distance and Direction	Mean, (Fraction) & [Range][b]	Mean, (Fraction) & [Range][b]	
WATERBORNE Groundwater (Monitoring wells) [pCi/L]	Gamma isotopic (56)	Co-60:15 pCi/L Cs-137:18 pCi/L	Co-60: <MDA (0/56) [N/A]; Cs-137: <MDA (0/56) [N/A]	Co-60: N/A; Cs-137: N/A	Co-60: <MDA (0/56) [N/A]; Cs-137: <MDA (0/56) [N/A]	Co-60: N/A; Cs-137: N/A	0
	Tritium(56)	ODCM: 2.0E+03 pCi/L Plant Policy: 400	<MDA, (0/56), [N/A]	N/A	<MDA, (0/56), [N/A]	N/A	0
Drinking Water	Not Required	N/A	N/A	N/A	N/A	Not Required	N/A
Sediment	Not Required	N/A	N/A	N/A	N/A	Not Required	N/A
Algae	Not Required	N/A	N/A	N/A	N/A	Not Required	N/A
INGESTION	Not Required	N/A	N/A	N/A	N/A	Not Required	N/A
TERRESTRIAL Soil	Not Required	N/A	N/A	N/A	N/A	Not Required	N/A

[a] The LLD is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95 percent probability with only 5 percent probability of falsely concluding that a blank observation represents a "real" signal. LLD is defined as the a priori (before the fact) lower limit of detection (as pCi per unit mass or volume) representing the capability of a measurement system and not as the a posteriori (after the fact) limit for a particular measurement. (Current literature defines the LLD as the detection capability for the instrumentation only, and the MDA, minimum detectable concentration, as the detection capability for a given instrument, procedure and type of sample.) The actual MDA values for the radionuclide specific analyses were at or below the LLD.

[b] The mean and the range are based on detectable measurements only. The fraction of detectable measurements at specified locations is indicated in parentheses; e.g., (10/12) means that 10 out of 12 samples contained detectable activity. The range of detected results is indicated in brackets; e.g., [23 to 34].

Not Required: Not required by the HBPP Unit 3 Technical Specifications or the SAFSTOR Offsite Dose Calculation Manual. Baseline environmental conditions for this parameter were established in the Environmental Report as referenced by the SAFSTOR Decommissioning Plan (now identified as the Post Shutdown Decommissioning Activities Report and Defueled Safety Analysis Report).

N/A – Not applicable

TABLE C-2
ONSITE ENVIRONMENTAL TLD STATIONS

Station Number	TLD Exposure Measurements (mR)			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
T1	16.0 ± 0.3	14.7 ± 0.3	14.8 ± 0.2	15.8 ± 0.2
T2	15.1 ± 0.4	14.6 ± 0.3	13.6 ± 0.2	14.2 ± 0.2
T3	14.6 ± 0.3	13.7 ± 0.3	13.8 ± 0.2	14.2 ± 0.3
T4	15.2 ± 0.3	14.2 ± 0.2	14.2 ± 0.2	14.9 ± 0.3
T5	14.5 ± 0.4	13.8 ± 0.2	13.7 ± 0.2	14.3 ± 0.2
T6	13.9 ± 0.5	12.9 ± 0.2	12.3 ± 0.2	13.4 ± 0.2
T7	15.1 ± 0.4	13.5 ± 0.1	13.1 ± 0.2	14.0 ± 0.4
T8	14.2 ± 0.2	13.0 ± 0.2	12.6 ± 0.2	13.2 ± 0.3
T9	14.9 ± 0.4	14.1 ± 0.2	13.9 ± 0.2	15.0 ± 0.2
T10	13.8 ± 0.3	13.5 ± 0.3	13.3 ± 0.1	13.8 ± 0.2
T11	14.2 ± 0.3	13.9 ± 0.3	13.7 ± 0.2	14.5 ± 0.2
T12	14.7 ± 0.3	14.3 ± 0.3	14.2 ± 0.2	14.7 ± 0.3
T13	14.6 ± 0.3	14.2 ± 0.3	14.2 ± 0.1	14.6 ± 0.2
T14	15.4 ± 0.3	14.5 ± 0.1	14.7 ± 0.2	15.1 ± 0.4
T15	14.0 ± 0.1	13.8 ± 0.3	13.8 ± 0.2	14.1 ± 0.3
T16	13.2 ± 0.3	13.4 ± 0.3	12.9 ± 0.2	13.5 ± 0.3
T18	16.0 ± 0.4	15.2 ± 0.1	15.0 ± 0.2	15.0 ± 0.4
T19	15.8 ± 0.2	15.2 ± 0.4	15.2 ± 0.2	16.4 ± 0.3
T20	15.7 ± 0.4	14.8 ± 0.1	14.8 ± 0.3	15.8 ± 0.3
T21	14.8 ± 0.3	14.7 ± 0.2	15.1 ± 1.1	15.0 ± 0.2

Parameter	Calculated Parameters (mR)			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Average	14.8 ± 0.1	14.1 ± 0.1	13.9 ± 0.1	14.6 ± 0.1
Maximum	16.0 ± 0.4	15.2 ± 0.4	15.2 ± 0.2	16.4 ± 0.3

Table C-2 Notes:

1. These exposures are reported for a standardized period of 90 days.

TABLE C-3
OFFSITE (Control) ENVIRONMENTAL TLD STATIONS

Station Number	TLD Exposure Measurements (mR)			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1	14.4 ± 0.4	13.5 ± 0.3	13.5 ± 0.2	14.1 ± 0.3
2	15.7 ± 0.4	15.1 ± 0.3	14.8 ± 0.3	16.1 ± 0.2
14	13.6 ± 0.5	12.7 ± 0.2	12.8 ± 0.1	13.0 ± 0.2
25	14.0 ± 0.4	13.3 ± 0.2	12.7 ± 0.2	13.3 ± 0.1
T17	13.4 ± 0.6	13.0 ± 0.2	12.9 ± 0.2	13.2 ± 0.3

Parameter	Calculated Parameters (mR)			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Average	14.2 ± 0.2	13.5 ± 0.1	13.3 ± 0.1	13.9 ± 0.1
Maximum	15.7 ± 0.4	15.1 ± 0.3	14.8 ± 0.3	16.1 ± 0.2

Table C-3 Notes:

1. These exposures are reported for a standardized period of 90 days.

TABLE C-4
GROUNDWATER MONITORING WELL RESULTS

Monitor Well Number	Sample Date	Alpha Activity (pCi/L)	Beta Activity (pCi/L)	Gamma Activity (pCi/L)		Tritium Activity (pCi/L)
				Cs-137	Co-60	
MW-11*	2/12/2014	< 14.7 (MDA)	< 6.58 (MDA)	< 4.63 (MDA)	< 5.60 (MDA)	< 328 (MDA)
RCW-SFP-1*	2/12/2014	< 2.45 (MDA)	< 1.32 (MDA)	< 4.52 (MDA)	< 3.90 (MDA)	< 341 (MDA)
RCW-SFP-2*	2/12/2014	< 5.07 (MDA)	12.3 ± 3.88	< 4.05 (MDA)	< 4.41 (MDA)	< 328 (MDA)
RCW-SFP-3*	2/12/2014	< 4.78 (MDA)	6.04 ± 2.01	< 6.28 (MDA)	< 4.99 (MDA)	< 342 (MDA)
RCW-SFP-4*	2/12/2014	< 4.54 (MDA)	4.16 ± 1.43	< 6.75 (MDA)	< 6.14 (MDA)	< 336 (MDA)
RCW-SFP-5*	2/12/2014	< 4.04 (MDA)	< 4.90 (MDA)	< 4.58 (MDA)	< 4.40 (MDA)	< 335 (MDA)
RCW-SFP-6*	2/12/2014	< 15.3 (MDA)	< 8.37 (MDA)	< 3.99 (MDA)	< 4.29 (MDA)	< 332 (MDA)
RCW-CS-3*	2/12/2014	< 2.58 (MDA)	1.74 ± 0.96	< 4.87 (MDA)	< 5.78 (MDA)	< 332 (MDA)
RCW-CS-5*	2/12/2014	< 2.27 (MDA)	3.04 ± 1.09	< 4.86 (MDA)	< 2.91 (MDA)	< 333 (MDA)
RCW-CS-6*	2/12/2014	< 71.8 (MDA)	< 71.2 (MDA)	< 3.82 (MDA)	< 3.90 (MDA)	< 334 (MDA)
RCW-CS-7*	2/12/2014	< 95.0 (MDA)	< 82.5 (MDA)	< 4.67 (MDA)	< 4.99 (MDA)	< 342 (MDA)
RCW-CS-8*	2/12/2014	< 93.7 (MDA)	< 93.3 (MDA)	< 5.71 (MDA)	< 7.00 (MDA)	< 344 (MDA)
RCW-CS-9*	2/12/2014	< 23.3 (MDA)	< 19.6 (MDA)	< 4.42 (MDA)	< 3.69 (MDA)	< 346 (MDA)
RCW-CS-10*	2/12/2014	< 15.1 (MDA)	< 12.2 (MDA)	< 3.72 (MDA)	< 4.14 (MDA)	< 339 (MDA)
MW-11*	5/15/2014	< 18.7 (MDA)	< 13.2 (MDA)	< 5.58 (MDA)	< 4.72 (MDA)	< 245 (MDA)
RCW-SFP-1*	5/15/2014	< 3.46 (MDA)	< 3.28 (MDA)	< 4.63 (MDA)	< 4.29 (MDA)	< 243 (MDA)
RCW-SFP-2*	5/15/2014	< 10.8 (MDA)	< 6.99 (MDA)	< 4.17 (MDA)	< 2.57 (MDA)	< 243 (MDA)
RCW-SFP-3*	5/15/2014	< 6.22 (MDA)	< 5.40 (MDA)	< 3.94 (MDA)	< 4.25 (MDA)	< 247 (MDA)
RCW-SFP-4*	5/15/2014	< 4.16 (MDA)	3.75 ± 1.50	< 3.72 (MDA)	< 3.77 (MDA)	< 253 (MDA)
RCW-SFP-5*	5/15/2014	< 6.45 (MDA)	< 3.44 (MDA)	< 4.93 (MDA)	< 6.08 (MDA)	< 242 (MDA)
RCW-SFP-6*	5/15/2014	< 14.2 (MDA)	< 6.47 (MDA)	< 4.38 (MDA)	< 4.83 (MDA)	< 244 (MDA)
RCW-CS-3*	5/15/2014	< 3.23 (MDA)	< 2.80 (MDA)	< 4.38 (MDA)	< 4.21 (MDA)	< 253 (MDA)
RCW-CS-5*	5/15/2014	< 3.08 (MDA)	< 2.25 (MDA)	< 4.04 (MDA)	< 3.48 (MDA)	< 251 (MDA)
RCW-CS-6*	5/15/2014	< 60.3 (MDA)	< 41.7 (MDA)	< 4.34 (MDA)	< 3.94 (MDA)	< 244 (MDA)
RCW-CS-7*	5/15/2014	< 83.5 (MDA)	< 57.5 (MDA)	< 4.41 (MDA)	< 4.69 (MDA)	< 249 (MDA)
RCW-CS-8*	5/15/2014	< 105 (MDA)	< 93.8 (MDA)	< 5.35 (MDA)	< 4.19 (MDA)	< 264 (MDA)
RCW-CS-9*	5/15/2014	< 16.0 (MDA)	< 19.3 (MDA)	< 6.82 (MDA)	< 4.75 (MDA)	< 242 (MDA)
RCW-CS-10*	5/15/2014	< 9.47 (MDA)	< 14.3 (MDA)	< 3.66 (MDA)	< 4.53 (MDA)	< 249 (MDA)
MW-11*	8/13/2014	< 15.2 (MDA)	< 13.6 (MDA)	< 3.82 (MDA)	< 5.39 (MDA)	< 309 (MDA)
RCW-SFP-1*	8/13/2014	< 3.43 (MDA)	< 2.84 (MDA)	< 5.19 (MDA)	< 3.66 (MDA)	< 315 (MDA)
RCW-SFP-2*	8/13/2014	< 21.2 (MDA)	< 10.7 (MDA)	< 3.31 (MDA)	< 4.12 (MDA)	< 324 (MDA)
RCW-SFP-3*	8/13/2014	< 10.3 (MDA)	< 6.51 (MDA)	< 5.38 (MDA)	< 3.14 (MDA)	< 314 (MDA)
RCW-SFP-4*	8/13/2014	< 4.66 (MDA)	4.53 ± 2.07	< 4.41 (MDA)	< 4.58 (MDA)	< 302 (MDA)
RCW-SFP-5*	8/13/2014	< 5.62 (MDA)	< 4.97 (MDA)	< 5.40 (MDA)	< 5.78 (MDA)	< 313 (MDA)
RCW-SFP-6*	8/13/2014	< 16.8 (MDA)	< 12.3 (MDA)	< 5.20 (MDA)	< 4.60 (MDA)	< 321 (MDA)
RCW-CS-3*	8/13/2014	< 3.18 (MDA)	< 3.33 (MDA)	< 5.10 (MDA)	< 5.80 (MDA)	< 318 (MDA)
RCW-CS-5*	8/13/2014	< 2.76 (MDA)	< 2.33 (MDA)	< 4.32 (MDA)	< 4.66 (MDA)	< 323 (MDA)
RCW-CS-6*	8/13/2014	< 96.0 (MDA)	< 58.5 (MDA)	< 3.58 (MDA)	< 3.62 (MDA)	< 316 (MDA)
RCW-CS-7*	8/13/2014	< 129 (MDA)	< 78.1 (MDA)	< 5.39 (MDA)	< 6.68 (MDA)	< 324 (MDA)
RCW-CS-8*	8/13/2014	< 171 (MDA)	< 111 (MDA)	< 4.36 (MDA)	< 2.46 (MDA)	< 288 (MDA)
RCW-CS-9*	8/13/2014	< 32.5 (MDA)	< 25.7 (MDA)	< 5.18 (MDA)	< 3.60 (MDA)	< 318 (MDA)
RCW-CS-10*	8/13/2014	< 37.7 (MDA)	< 23.1 (MDA)	< 5.01 (MDA)	< 5.27 (MDA)	< 318 (MDA)

*Indicates fourteen (14) groundwater monitoring wells.

TABLE C-4 (Continued)
GROUNDWATER MONITORING WELL RESULTS

Monitor Well Number	Sample Date	Alpha Activity (pCi/L)	Beta Activity (pCi/L)	Gamma Activity (pCi/L)		Tritium Activity (pCi/L)
				Cs-137	Co-60	
MW-11*	8/13/2014	< 20.1 (MDA)	< 10.4 (MDA)	< 4.84 (MDA)	< 5.09 (MDA)	< 324 (MDA)
RCW-SFP-1*	8/13/2014	< 2.55 (MDA)	1.89 ± 0.92	< 4.08 (MDA)	< 4.20 (MDA)	< 322 (MDA)
RCW-SFP-2*	8/13/2014	< 15.4 (MDA)	< 13.2 (MDA)	< 4.99 (MDA)	< 5.58 (MDA)	< 319 (MDA)
RCW-SFP-3*	8/13/2014	< 10.9 (MDA)	< 6.60 (MDA)	< 4.93 (MDA)	< 5.52 (MDA)	< 311 (MDA)
RCW-SFP-4*	8/13/2014	< 6.14 (MDA)	4.84 ± 2.08	< 5.88 (MDA)	< 7.85 (MDA)	< 320 (MDA)
RCW-SFP-5*	8/13/2014	< 5.33 (MDA)	< 4.47 (MDA)	< 4.31 (MDA)	< 5.64 (MDA)	< 321 (MDA)
RCW-SFP-6*	8/13/2014	< 17.8 (MDA)	< 11.2 (MDA)	< 5.05 (MDA)	< 6.86 (MDA)	< 315 (MDA)
RCW-CS-3*	8/13/2014	< 2.29 (MDA)	< 1.97 (MDA)	< 8.93 (MDA)	< 7.41 (MDA)	< 310 (MDA)
RCW-CS-5*	8/13/2014	< 2.12 (MDA)	3.19 ± 1.29	< 6.69 (MDA)	< 8.40 (MDA)	< 318 (MDA)
RCW-CS-6*	8/13/2014	< 144 (MDA)	< 98.3 (MDA)	< 7.08 (MDA)	< 9.33 (MDA)	< 313 (MDA)
RCW-CS-7*	8/13/2014	< 140 (MDA)	< 70.3 (MDA)	< 7.65 (MDA)	< 4.89 (MDA)	< 321 (MDA)
RCW-CS-8*	8/13/2014	< 218 (MDA)	< 129 (MDA)	< 6.65 (MDA)	< 8.23 (MDA)	< 320 (MDA)
RCW-CS-9*	8/13/2014	< 34.3 (MDA)	< 26.4 (MDA)	< 6.95 (MDA)	< 4.70 (MDA)	< 324 (MDA)
RCW-CS-10*	8/13/2014	< 25.4 (MDA)	< 18.0 (MDA)	< 7.88 (MDA)	< 6.49 (MDA)	< 319 (MDA)

*Indicates (14) groundwater monitoring wells.

TABLE C-4 (Continued)
GROUNDWATER MONITORING WELL RESULTS

Calculated Parameters (By Monitor Well Number)	Alpha Activity (pCi/L)	Beta Activity (pCi/L)	Gamma Activity (pCi/L)		Tritium Activity (pCi/L)
			Cs-137	Co-60	
Average: MW-11*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-SFP-1*	Note 4	1.89 ± 0.92	Note 4	Note 4	Note 4
Average: RCW-SFP-2*	Note 4	12.3 ± 3.88	Note 4	Note 4	Note 4
Average: RCW-SFP-3*	Note 4	6.04 ± 2.01	Note 4	Note 4	Note 4
Average: RCW-SFP-4*	Note 4	4.32 ± 0.90	Note 4	Note 4	Note 4
Average: RCW-SFP-5*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-SFP-6*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-CS-3*	Note 4	1.74 ± 0.96	Note 4	Note 4	Note 4
Average: RCW-CS-5*	Note 4	3.12 ± 0.84	Note 4	Note 4	Note 4
Average: RCW-CS-6*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-CS-7*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-CS-8*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-CS-9*	Note 4	Note 4	Note 4	Note 4	Note 4
Average: RCW-CS-10*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: MW-11	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-SFP-1*	Note 4	1.89 ± 0.92	Note 4	Note 4	Note 4
Maximum: RCW-SFP-2*	Note 4	12.3 ± 3.88	Note 4	Note 4	Note 4
Maximum: RCW-SFP-3*	Note 4	6.04 ± 2.01	Note 4	Note 4	Note 4
Maximum: RCW-SFP-4*	Note 4	4.84 ± 2.08	Note 4	Note 4	Note 4
Maximum: RCW-SFP-5*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-SFP-6*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-CS-3*	Note 4	1.74 ± 0.96	Note 4	Note 4	Note 4
Maximum: RCW-CS-5*	Note 4	3.19 ± 1.29	Note 4	Note 4	Note 4
Maximum: RCW-CS-6*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-CS-7*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-CS-8*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-CS-9*	Note 4	Note 4	Note 4	Note 4	Note 4
Maximum: RCW-CS-10*	Note 4	Note 4	Note 4	Note 4	Note 4

*Indicates (14) groundwater monitoring wells.

Table C-4 Notes:

1. Reported values are net measurements (above instrument background). The normal minimum detectable activities (MDAs) for the analyses for gross alpha, gross beta and tritium are approximately 4, 4 and 300 pCi/L, respectively. Results that are at or below the normal MDA are reported as "<MDA".

2. Gamma activity measurements are performed on the original sample, with results corrected to the time of sampling. Naturally occurring isotopes are not reported. The maximum lower limits of detection (LLDs) for Co-60 and Cs-137 are 15 and 18 pCi/L, respectively. The actual MDAs for these analyses were at or below the LLD.

3. For purposes of this report, LLD is defined as the a priori (before the fact) lower limit of detection, which represents the capability of the measurement system. MDA is defined as the a posteriori (after the fact) limit of detection capability considering a given instrument, procedure and type of sample.

4. Results identified as "<" are not included in the calculation of average and maximum values.

TABLE C-5
CAISSON SUMP MONITORING RESULTS

Sample Date	Cs-137 Activity (pCi/L)	Co-60 Activity (pCi/L)	Tritium Activity (pCi/L)
1/29/2014	<MDA	42.0 ± 7.1	1030 ± 400
2/25/2014	<MDA	<MDA	650 ± 380
3/19/2014	<MDA	<MDA	< 630 (MDA)
4/14/2014	<MDA	<MDA	690 ± 380
5/23/2014	<MDA	<MDA	< 630 (MDA)
6/20/2014	<MDA	<MDA	< 630 (MDA)
7/18/2014	<MDA	<MDA	< 620 (MDA)
8/15/2014	<MDA	<MDA	< 620 (MDA)
9/12/2014	<MDA	<MDA	< 620 (MDA)
10/24/2014	<MDA	<MDA	< 630 (MDA)
11/13/2014	<MDA	<MDA	< 630 (MDA)
12/10/2014	<MDA	<MDA	< 660 (MDA)

Table C-5 Notes:

1. Gamma measurements are performed on the original sample, with results corrected to the time of sampling. Naturally occurring isotopes are not reported. The maximum lower limits of detection (LLDs) for Co-60 and Cs-137 are 15 and 18 pCi/L, respectively. The MDA for these analyses was at or below the LLD and are reported as "< MDA".

2. For purposes of this report, LLD is defined as the a priori (before the fact) lower limit of detection, which represents the capability of the measurement system. MDA is defined as the a posteriori (after the fact) limit of detection capability considering a given instrument, procedure and type of sample.

3. Tritium analysis is performed on a measured aliquot of distilled sample. The reported values are net measurements above instrument background. The normal MDA for the analyses for tritium was less than 600 pCi/L. Results that are at or below the normal MDA are reported as "< MDA".

TABLE C-6
FRENCH DRAIN MONITORING RESULTS

Sample Date	Cs-137 Activity (pCi/L)	Co-60 Activity (pCi/L)	Tritium Activity (pCi/L)
1/8/2014	217 ± 23	<MDA	< 640 (MDA)
2/5/2014	228 ± 24	<MDA	1050 ± 400
3/19/2014	275 ± 26	<MDA	< 630 (MDA)
4/14/2014	269 ± 26	<MDA	< 630 (MDA)
5/23/2014	285 ± 28	<MDA	< 630 (MDA)
6/20/2014	309 ± 28	<MDA	< 630 (MDA)
7/18/2014	294 ± 29	<MDA	810 ± 380
8/15/2014	326 ± 31	<MDA	< 620 (MDA)
9/12/2014	306 ± 30	<MDA	780 ± 380
10/24/2014	300 ± 29	<MDA	2,500 ± 430
11/7/2014	278 ± 27	<MDA	5,890 ± 440
11/13/2014	272 ± 26	<MDA	5,040 ± 470
11/20/2014	250 ± 24	<MDA	5,810 ± 480
11/25/2014	264 ± 27	<MDA	5,140 ± 490
12/4/2014	247 ± 25	<MDA	6,320 ± 480
12/10/2014	251 ± 26	<MDA	5,700 ± 490
12/18/2014	245 ± 26	<MDA	6,590 ± 490

Table C-6 Notes:

1. Gamma measurements are performed on the original sample, with results corrected to the time of sampling. Naturally occurring isotopes are not reported. The maximum lower limits of detection (LLDs) for Co-60 and Cs-137 are 15 and 18 pCi/L, respectively. The MDA for these analyses was at or below the LLD and are reported as "< MDA".

2. For purposes of this report, LLD is defined as the a priori (before the fact) lower limit of detection, which represents the capability of the measurement system. MDA is defined as the a posteriori (after the fact) limit of detection capability considering a given instrument, procedure and type of sample.

3. Tritium analysis is performed on a measured aliquot of distilled sample. The reported values are net measurements above instrument background. The normal MDA for the analyses for tritium was less than 600 pCi/L. Results that are at or below the normal MDA are reported as "< MDA".

Table C-7
ODCM REQUIRED AIR SAMPLES: EAST FENCE (AM1)

Sample Start Date	Alpha Activity (pCi/m^3)	Beta Activity (pCi/m^3)	Composite Gamma Activity (pCi/m^3)	
			Co-60	Cs-137
1/2/2014	< 3.47E-03 (MDA)	1.26E-02 ± 4.29E-03	< 6.71E-04 (MDA)	< 6.57E-04 (MDA)
1/9/2014	< 3.38E-03 (MDA)	1.23E-02 ± 4.18E-03		
1/16/2014	2.91E-03 ± 2.09E-03	2.21E-02 ± 5.11E-03		
1/23/2014	3.56E-03 ± 2.34E-03	3.35E-02 ± 6.14E-03		
1/30/2014	< 3.43E-03 (MDA)	9.29E-03 ± 3.85E-03		
2/6/2014	< 3.32E-03 (MDA)	5.52E-03 ± 3.25E-03		
2/13/2014	< 3.36E-03 (MDA)	< 6.05E-03 (MDA)		
2/20/2014	< 3.42E-03 (MDA)	1.10E-02 ± 4.05E-03		
2/27/2014	< 3.39E-03 (MDA)	3.52E-03 ± 3.01E-03		
3/6/2014	< 3.32E-03 (MDA)	8.30E-03 ± 3.64E-03		
3/13/2014	< 3.40E-03 (MDA)	6.02E-03 ± 3.39E-03		
3/20/2014	< 3.33E-03 (MDA)	8.33E-03 ± 3.65E-03		
3/27/2014	< 3.41E-03 (MDA)	7.45E-03 ± 3.59E-03		
4/3/2014	2.35E-03 ± 1.88E-03	6.97E-03 ± 3.47E-03	< 7.22E-04 (MDA)	< 6.37E-04 (MDA)
4/10/2014	2.39E-03 ± 1.91E-03	1.38E-02 ± 4.37E-03		
4/17/2014	< 3.32E-03 (MDA)	8.64E-03 ± 3.69E-03		
4/24/2014	< 3.41E-03 (MDA)	8.52E-03 ± 3.74E-03		
5/1/2014	< 3.33E-03 (MDA)	1.07E-02 ± 3.94E-03		
5/8/2014	< 3.44E-03 (MDA)	3.76E-02 ± 6.51E-03		
5/15/2014	< 3.26E-03 (MDA)	1.12E-02 ± 3.95E-03		
5/22/2014	< 3.48E-03 (MDA)	3.26E-02 ± 6.16E-03		
5/29/2014	< 3.35E-03 (MDA)	7.31E-03 ± 3.53E-03		
6/5/2014	< 3.38E-03 (MDA)	3.51E-03 ± 3.00E-03		
6/12/2014	< 3.33E-03 (MDA)	< 5.99E-03 (MDA)		
6/19/2014	< 3.41E-03 (MDA)	2.49E-02 ± 5.44E-03		
6/26/2014	< 3.31E-03 (MDA)	< 5.96E-03 (MDA)		
7/3/2014	< 3.43E-03 (MDA)	< 6.17E-03 (MDA)	< 9.38E-04 (MDA)	< 6.52E-04 (MDA)
7/10/2014	< 3.38E-03 (MDA)	5.27E-03 ± 3.26E-03		
7/17/2014	< 3.37E-03 (MDA)	< 6.07E-03 (MDA)		
7/24/2014	< 3.32E-03 (MDA)	5.52E-03 ± 3.25E-03		
7/31/2014	< 3.37E-03 (MDA)	5.26E-03 ± 3.26E-03		
8/7/2014	< 3.38E-03 (MDA)	7.74E-03 ± 3.61E-03		
8/14/2014	< 3.42E-03 (MDA)	8.18E-03 ± 3.69E-03		
8/21/2014	< 3.33E-03 (MDA)	4.49E-03 ± 3.11E-03		
8/28/2014	< 3.40E-03 (MDA)	1.31E-02 ± 4.28E-03		
9/4/2014	< 3.26E-03 (MDA)	1.43E-02 ± 4.29E-03		
9/11/2014	2.96E-03 ± 2.13E-03	1.48E-02 ± 4.43E-03		
9/18/2014	< 3.34E-03 (MDA)	1.39E-02 ± 4.32E-03		
9/25/2014	< 3.48E-03 (MDA)	1.49E-02 ± 4.54E-03		
10/2/2014	2.98E-03 ± 2.06E-03	2.71E-02 ± 5.57E-03	< 8.55E-04 (MDA)	< 9.13E-04 (MDA)
10/9/2014	3.04E-03 ± 2.19E-03	5.76E-03 ± 3.39E-03		
10/16/2014	< 3.22E-03 (MDA)	5.69E-03 ± 3.21E-03		
10/23/2014	< 3.53E-03 (MDA)	9.55E-03 ± 3.96E-03		
10/30/2014	< 3.37E-03 (MDA)	1.48E-02 ± 4.43E-03		
11/6/2014	< 3.36E-03 (MDA)	1.92E-02 ± 4.88E-03		
11/13/2014	2.89E-03 ± 2.08E-03	1.62E-02 ± 4.53E-03		
11/20/2014	< 4.07E-03 (MDA)	4.65E-03 ± 3.67E-03		
11/26/2014	2.02E-03 ± 1.62E-03	1.29E-02 ± 3.82E-03		
12/4/2014	< 3.42E-03 (MDA)	1.32E-02 ± 4.30E-03		
12/11/2014	< 3.36E-03 (MDA)	< 6.05E-03 (MDA)		
12/18/2014	< 4.01E-03 (MDA)	9.61E-03 ± 4.33E-03		
12/24/2014	< 3.93E-03 (MDA)	7.35E-03 ± 3.97E-03		

Table C-7 (Continued)
ODCM REQUIRED AIR SAMPLES: BUILDING 12 (AM2)

Sample Start Date	Alpha Activity (pCi/m^3)	Beta Activity (pCi/m^3)	Composite Gamma Activity (pCi/m^3)	
			Co-60	Cs-137
1/2/2014	2.43E-03 ± 1.95E-03	2.78E-02 ± 5.77E-03	< 8.90E-04 (MDA)	< 4.43E-04 (MDA)
1/9/2014	< 3.40E-03 (MDA)	1.81E-02 ± 4.81E-03		
1/16/2014	< 3.30E-03 (MDA)	3.51E-02 ± 6.18E-03		
1/23/2014	< 3.14E-03 (MDA)	3.87E-02 ± 6.27E-03		
1/30/2014	3.01E-03 ± 2.17E-03	7.14E-03 ± 3.56E-03		
2/6/2014	< 3.31E-03 (MDA)	< 5.96E-03 (MDA)		
2/13/2014	< 3.36E-03 (MDA)	< 6.05E-03 (MDA)		
2/20/2014	2.40E-03 ± 1.92E-03	1.78E-02 ± 4.79E-03		
2/27/2014	< 3.39E-03 (MDA)	3.88E-03 ± 3.06E-03		
3/6/2014	< 3.32E-03 (MDA)	7.61E-03 ± 3.55E-03		
3/13/2014	2.38E-03 ± 1.91E-03	8.84E-03 ± 3.78E-03		
3/20/2014	< 3.35E-03 (MDA)	1.57E-02 ± 4.52E-03		
3/27/2014	< 3.41E-03 (MDA)	7.10E-03 ± 3.54E-03		
4/3/2014	< 3.34E-03 (MDA)	8.69E-03 ± 3.71E-03	< 7.22E-04 (MDA)	< 7.76E-04 (MDA)
4/10/2014	< 3.41E-03 (MDA)	6.04E-03 ± 3.40E-03		
4/17/2014	< 3.31E-03 (MDA)	1.21E-02 ± 4.10E-03		
4/24/2014	< 3.42E-03 (MDA)	1.10E-02 ± 4.05E-03		
5/1/2014	< 3.32E-03 (MDA)	1.21E-02 ± 4.10E-03		
5/8/2014	< 3.44E-03 (MDA)	1.44E-02 ± 4.46E-03		
5/15/2014	< 3.26E-03 (MDA)	1.22E-02 ± 4.06E-03		
5/22/2014	4.28E-03 ± 2.60E-03	1.02E-02 ± 4.00E-03		
5/29/2014	2.93E-03 ± 2.11E-03	1.25E-02 ± 4.16E-03		
6/5/2014	< 3.39E-03 (MDA)	2.76E-02 ± 5.67E-03		
6/12/2014	< 3.33E-03 (MDA)	5.19E-03 ± 3.21E-03		
6/19/2014	< 3.43E-03 (MDA)	6.77E-03 ± 3.52E-03		
6/26/2014	< 3.30E-03 (MDA)	< 5.94E-03 (MDA)		
7/3/2014	< 3.42E-03 (MDA)	7.84E-03 ± 3.66E-03	< 1.02E-03 (MDA)	< 8.58E-04 (MDA)
7/10/2014	< 3.38E-03 (MDA)	5.63E-03 ± 3.32E-03		
7/17/2014	< 3.37E-03 (MDA)	9.47E-03 ± 3.83E-03		
7/24/2014	< 3.32E-03 (MDA)	5.18E-03 ± 3.20E-03		
7/31/2014	< 3.40E-03 (MDA)	5.65E-03 ± 3.33E-03		
8/7/2014	< 3.36E-03 (MDA)	9.09E-03 ± 3.77E-03		
8/14/2014	< 3.42E-03 (MDA)	3.55E-03 ± 3.04E-03		
8/21/2014	< 3.33E-03 (MDA)	5.88E-03 ± 3.32E-03		
8/28/2014	< 3.39E-03 (MDA)	5.65E-03 ± 3.33E-03		
9/4/2014	< 3.26E-03 (MDA)	1.50E-02 ± 4.36E-03		
9/11/2014	< 3.37E-03 (MDA)	1.72E-02 ± 4.70E-03		
9/18/2014	< 3.34E-03 (MDA)	1.29E-02 ± 4.19E-03		
9/25/2014	3.05E-03 ± 2.19E-03	1.34E-02 ± 4.37E-03		
10/2/2014	2.98E-03 ± 2.07E-03	2.19E-02 ± 5.12E-03	< 8.44E-04 (MDA)	< 7.10E-04 (MDA)
10/9/2014	< 3.46E-03 (MDA)	1.30E-02 ± 4.32E-03		
10/16/2014	< 3.22E-03 (MDA)	4.68E-03 ± 3.05E-03		
10/23/2014	< 3.56E-03 (MDA)	5.55E-03 ± 3.43E-03		
10/30/2014	< 3.35E-03 (MDA)	1.01E-02 ± 3.89E-03		
11/6/2014	2.95E-03 ± 2.12E-03	1.23E-02 ± 4.16E-03		
11/13/2014	2.89E-03 ± 2.08E-03	1.71E-02 ± 4.62E-03		
11/20/2014	< 4.10E-03 (MDA)	7.25E-03 ± 4.09E-03		
11/26/2014	< 2.87E-03 (MDA)	1.23E-02 ± 3.75E-03		
12/4/2014	< 3.44E-03 (MDA)	7.15E-03 ± 3.57E-03		
12/11/2014	< 3.35E-03 (MDA)	5.92E-03 ± 3.34E-03		
12/18/2014	< 4.03E-03 (MDA)	< 7.25E-03 (MDA)		
12/24/2014	< 3.88E-03 (MDA)	1.01E-02 ± 4.31E-03		

Table C-7 (Continued)
ODCM REQUIRED AIR SAMPLES: ANNEX BUILDING (AM3)

Sample Date	Alpha Activity (pCi/m^3)	Beta Activity (pCi/m^3)	Composite Gamma Activity (pCi/m^3)	
			Co-60	Cs-137
1/2/2014	< 3.47E-03 (MDA)	1.95E-02 ± 5.01E-03	< 5.47E-04 (MDA)	< 5.77E-04 (MDA)
1/9/2014	< 3.38E-03 (MDA)	1.23E-02 ± 4.18E-03		
1/16/2014	< 3.30E-03 (MDA)	2.79E-02 ± 5.60E-03		
1/23/2014	4.15E-03 ± 2.52E-03	3.39E-02 ± 6.16E-03		
1/30/2014	< 3.41E-03 (MDA)	7.10E-03 ± 3.54E-03		
2/6/2014	< 3.34E-03 (MDA)	3.47E-03 ± 2.96E-03		
2/13/2014	< 3.36E-03 (MDA)	< 6.05E-03 (MDA)		
2/20/2014	< 3.40E-03 (MDA)	1.38E-02 ± 4.37E-03		
2/27/2014	< 3.40E-03 (MDA)	< 6.12E-03 (MDA)		
3/6/2014	< 3.31E-03 (MDA)	6.20E-03 ± 3.35E-03		
3/13/2014	2.38E-03 ± 1.90E-03	9.54E-03 ± 3.86E-03		
3/20/2014	< 3.34E-03 (MDA)	1.11E-02 ± 4.01E-03		
3/27/2014	< 3.41E-03 (MDA)	6.39E-03 ± 3.45E-03		
4/3/2014	< 3.35E-03 (MDA)	4.52E-03 ± 3.13E-03	< 7.44E-04 (MDA)	< 7.34E-04 (MDA)
4/10/2014	< 3.40E-03 (MDA)	8.86E-03 ± 3.78E-03		
4/17/2014	< 3.33E-03 (MDA)	8.32E-03 ± 3.65E-03		
4/24/2014	< 3.41E-03 (MDA)	9.94E-03 ± 3.91E-03		
5/1/2014	2.93E-03 ± 2.11E-03	1.18E-02 ± 4.07E-03		
5/8/2014	< 3.42E-03 (MDA)	1.18E-02 ± 4.14E-03		
5/15/2014	< 3.27E-03 (MDA)	1.36E-02 ± 4.22E-03		
5/22/2014	< 3.47E-03 (MDA)	6.87E-03 ± 3.57E-03		
5/29/2014	< 3.36E-03 (MDA)	1.15E-02 ± 4.06E-03		
6/5/2014	< 3.39E-03 (MDA)	3.52E-03 ± 3.00E-03		
6/12/2014	< 3.33E-03 (MDA)	7.63E-03 ± 3.56E-03		
6/19/2014	< 3.41E-03 (MDA)	5.67E-03 ± 3.34E-03		
6/26/2014	< 3.32E-03 (MDA)	4.83E-03 ± 3.15E-03		
7/3/2014	< 3.40E-03 (MDA)	< 6.13E-03 (MDA)	< 6.52E-04 (MDA)	< 1.10E-03 (MDA)
7/10/2014	< 3.39E-03 (MDA)	4.59E-03 ± 3.17E-03		
7/17/2014	< 3.37E-03 (MDA)	< 6.06E-03 (MDA)		
7/24/2014	< 3.35E-03 (MDA)	3.83E-03 ± 3.02E-03		
7/31/2014	< 3.33E-03 (MDA)	< 5.99E-03 (MDA)		
8/7/2014	< 3.40E-03 (MDA)	1.42E-02 ± 4.39E-03		
8/14/2014	< 3.41E-03 (MDA)	3.54E-03 ± 3.02E-03		
8/21/2014	2.92E-03 ± 2.10E-03	6.23E-03 ± 3.37E-03		
8/28/2014	< 3.39E-03 (MDA)	1.10E-02 ± 4.02E-03		
9/4/2014	< 3.28E-03 (MDA)	1.26E-02 ± 4.12E-03		
9/11/2014	< 3.37E-03 (MDA)	1.76E-02 ± 4.73E-03		
9/18/2014	< 3.34E-03 (MDA)	1.36E-02 ± 4.29E-03		
9/25/2014	< 3.48E-03 (MDA)	9.06E-03 ± 3.87E-03		
10/2/2014	< 3.26E-03 (MDA)	2.04E-02 ± 4.96E-03	< 9.45E-04 (MDA)	< 9.95E-04 (MDA)
10/9/2014	< 3.34E-03 (MDA)	9.02E-03 ± 3.85E-03		
10/16/2014	< 3.21E-03 (MDA)	7.01E-03 ± 3.38E-03		
10/23/2014	< 3.56E-03 (MDA)	1.15E-02 ± 4.21E-03		
10/30/2014	< 3.35E-03 (MDA)	5.92E-03 ± 3.33E-03		
11/6/2014	< 3.36E-03 (MDA)	1.30E-02 ± 4.23E-03		
11/13/2014	< 3.31E-03 (MDA)	1.17E-02 ± 4.03E-03		
11/20/2014	< 4.08E-03 (MDA)	< 7.34E-03 (MDA)		
11/26/2014	< 2.87E-03 (MDA)	1.01E-02 ± 3.50E-03		
12/4/2014	< 3.43E-03 (MDA)	4.64E-03 ± 3.20E-03		
12/11/2014	< 3.37E-03 (MDA)	< 6.06E-03 (MDA)		
12/18/2014	< 4.00E-03 (MDA)	< 7.20E-03 (MDA)		
12/24/2014	< 3.90E-03 (MDA)	8.52E-03 ± 4.11E-03		

Table C-7 (Continued)
ODCM REQUIRED AIR SAMPLES: RELAY BUILDING (AM4)

Sample Date	Alpha Activity (pCi/m^3)	Beta Activity (pCi/m^3)	Composite Gamma Activity (pCi/m^3)	
			Co-60	Cs-137
1/2/2014	< 3.47E-03 (MDA)	1.84E-02 ± 4.90E-03	< 8.33E-04 (MDA)	< 6.90E-04 (MDA)
1/9/2014	< 3.38E-03 (MDA)	1.16E-02 ± 4.09E-03		
1/16/2014	< 3.30E-03 (MDA)	2.41E-02 ± 5.27E-03		
1/23/2014	< 3.38E-03 (MDA)	3.28E-02 ± 6.09E-03		
1/30/2014	< 3.41E-03 (MDA)	< 6.14E-03 (MDA)		
2/6/2014	< 3.34E-03 (MDA)	< 6.01E-03 (MDA)		
2/13/2014	< 3.36E-03 (MDA)	< 6.05E-03 (MDA)		
2/20/2014	< 3.40E-03 (MDA)	1.17E-02 ± 4.12E-03		
2/27/2014	< 3.40E-03 (MDA)	4.24E-03 ± 3.12E-03		
3/6/2014	< 3.31E-03 (MDA)	7.58E-03 ± 3.54E-03		
3/13/2014	< 3.40E-03 (MDA)	6.36E-03 ± 3.44E-03		
3/20/2014	< 3.34E-03 (MDA)	9.05E-03 ± 3.75E-03		
3/27/2014	< 3.41E-03 (MDA)	< 6.13E-03 (MDA)		
4/3/2014	< 3.35E-03 (MDA)	6.27E-03 ± 3.39E-03	< 6.51E-04 (MDA)	< 6.26E-04 (MDA)
4/10/2014	< 3.40E-03 (MDA)	9.57E-03 ± 3.87E-03		
4/17/2014	< 3.33E-03 (MDA)	9.70E-03 ± 3.82E-03		
4/24/2014	< 3.41E-03 (MDA)	1.46E-02 ± 4.44E-03		
5/1/2014	< 3.34E-03 (MDA)	1.15E-02 ± 4.04E-03		
5/8/2014	2.40E-03 ± 1.92E-03	7.48E-03 ± 3.60E-03		
5/15/2014	< 3.27E-03 (MDA)	8.85E-03 ± 3.67E-03		
5/22/2014	< 3.47E-03 (MDA)	1.26E-02 ± 4.29E-03		
5/29/2014	2.36E-03 ± 1.89E-03	6.99E-03 ± 3.49E-03		
6/5/2014	< 3.39E-03 (MDA)	4.57E-03 ± 3.16E-03		
6/12/2014	< 3.33E-03 (MDA)	< 6.00E-03 (MDA)		
6/19/2014	< 3.41E-03 (MDA)	< 6.14E-03 (MDA)		
6/26/2014	< 3.32E-03 (MDA)	< 5.97E-03 (MDA)		
7/3/2014	< 3.41E-03 (MDA)	6.03E-03 ± 3.40E-03	< 7.88E-04 (MDA)	< 5.75E-04 (MDA)
7/10/2014	< 3.39E-03 (MDA)	< 6.10E-03 (MDA)		
7/17/2014	< 3.37E-03 (MDA)	< 6.06E-03 (MDA)		
7/24/2014	< 3.33E-03 (MDA)	4.50E-03 ± 3.11E-03		
7/31/2014	< 3.36E-03 (MDA)	6.98E-03 ± 3.48E-03		
8/7/2014	< 3.39E-03 (MDA)	4.58E-03 ± 3.17E-03		
8/14/2014	< 3.41E-03 (MDA)	< 6.14E-03 (MDA)		
8/21/2014	< 3.33E-03 (MDA)	7.62E-03 ± 3.56E-03		
8/28/2014	4.76E-03 ± 2.74E-03	9.19E-03 ± 3.81E-03		
9/4/2014	< 3.28E-03 (MDA)	1.13E-02 ± 3.97E-03		
9/11/2014	2.96E-03 ± 2.13E-03	1.90E-02 ± 4.87E-03		
9/18/2014	< 3.34E-03 (MDA)	1.71E-02 ± 4.65E-03		
9/25/2014	< 3.48E-03 (MDA)	1.27E-02 ± 4.30E-03		
10/2/2014	2.40E-03 ± 1.83E-03	2.32E-02 ± 5.22E-03	< 6.60E-04 (MDA)	< 7.38E-04 (MDA)
10/9/2014	< 3.46E-03 (MDA)	1.01E-02 ± 3.97E-03		
10/16/2014	< 3.21E-03 (MDA)	< 5.78E-03 (MDA)		
10/23/2014	< 3.55E-03 (MDA)	1.30E-02 ± 4.39E-03		
10/30/2014	< 3.35E-03 (MDA)	9.06E-03 ± 3.75E-03		
11/6/2014	2.95E-03 ± 2.12E-03	1.23E-02 ± 4.16E-03		
11/13/2014	< 3.31E-03 (MDA)	1.48E-02 ± 4.38E-03		
11/20/2014	< 4.08E-03 (MDA)	1.66E-02 ± 5.23E-03		
11/26/2014	< 2.86E-03 (MDA)	1.16E-02 ± 3.67E-03		
12/4/2014	< 3.43E-03 (MDA)	7.14E-03 ± 3.56E-03		
12/11/2014	< 3.37E-03 (MDA)	< 6.06E-03 (MDA)		
12/18/2014	< 4.00E-03 (MDA)	7.91E-03 ± 4.11E-03		
12/24/2014	< 3.90E-03 (MDA)	1.14E-02 ± 4.47E-03		

Table C-7 (Continued)
ODCM REQUIRED AIR SAMPLES: OIL WATER SEPARATOR (AM5)

Sample Date	Alpha Activity (pCi/m^3)	Beta Activity (pCi/m^3)	Composite Gamma Activity (pCi/m^3)	
			Co-60	Cs-137
1/2/2014	3.04E-03 ± 2.19E-03	2.71E-02 ± 5.70E-03	< 7.58E-04 (MDA)	< 6.86E-04 (MDA)
1/9/2014	2.97E-03 ± 2.14E-03	1.62E-02 ± 4.60E-03		
1/16/2014	2.91E-03 ± 2.09E-03	3.73E-02 ± 6.34E-03		
1/23/2014	< 3.38E-03 (MDA)	3.60E-02 ± 6.33E-03		
1/30/2014	< 3.43E-03 (MDA)	6.07E-03 ± 3.42E-03		
2/6/2014	< 3.34E-03 (MDA)	< 6.00E-03 (MDA)		
2/13/2014	< 3.36E-03 (MDA)	7.70E-03 ± 3.60E-03		
2/20/2014	< 3.40E-03 (MDA)	1.45E-02 ± 4.44E-03		
2/27/2014	< 3.40E-03 (MDA)	< 6.12E-03 (MDA)		
3/6/2014	< 3.31E-03 (MDA)	5.86E-03 ± 3.30E-03		
3/13/2014	< 3.40E-03 (MDA)	5.66E-03 ± 3.33E-03		
3/20/2014	< 3.12E-03 (MDA)	7.79E-03 ± 3.41E-03		
3/27/2014	< 3.39E-03 (MDA)	4.58E-03 ± 3.16E-03		
4/3/2014	< 3.37E-03 (MDA)	7.37E-03 ± 3.55E-03	< 7.17E-04 (MDA)	< 7.33E-04 (MDA)
4/10/2014	< 3.40E-03 (MDA)	1.06E-02 ± 4.00E-03		
4/17/2014	< 3.33E-03 (MDA)	7.27E-03 ± 3.51E-03		
4/24/2014	2.40E-03 ± 1.92E-03	9.61E-03 ± 3.89E-03		
5/1/2014	2.93E-03 ± 2.11E-03	1.78E-02 ± 4.72E-03		
5/8/2014	< 3.42E-03 (MDA)	1.14E-02 ± 4.10E-03		
5/15/2014	< 3.27E-03 (MDA)	1.46E-02 ± 4.33E-03		
5/22/2014	< 3.47E-03 (MDA)	7.94E-03 ± 3.71E-03		
5/29/2014	< 3.36E-03 (MDA)	6.99E-03 ± 3.49E-03		
6/5/2014	< 3.39E-03 (MDA)	5.28E-03 ± 3.27E-03		
6/12/2014	< 3.33E-03 (MDA)	5.89E-03 ± 3.32E-03		
6/19/2014	< 3.41E-03 (MDA)	7.45E-03 ± 3.59E-03		
6/26/2014	< 3.32E-03 (MDA)	4.14E-03 ± 3.05E-03		
7/3/2014	< 3.41E-03 (MDA)	8.52E-03 ± 3.74E-03	< 8.23E-04 (MDA)	< 7.57E-04 (MDA)
7/10/2014	< 3.39E-03 (MDA)	< 6.10E-03 (MDA)		
7/17/2014	< 3.37E-03 (MDA)	6.30E-03 ± 3.41E-03		
7/24/2014	< 3.33E-03 (MDA)	< 5.99E-03 (MDA)		
7/31/2014	2.36E-03 ± 1.89E-03	8.74E-03 ± 3.73E-03		
8/7/2014	< 3.42E-03 (MDA)	7.82E-03 ± 3.65E-03		
8/14/2014	< 3.38E-03 (MDA)	< 6.09E-03 (MDA)		
8/21/2014	< 3.33E-03 (MDA)	4.50E-03 ± 3.11E-03		
8/28/2014	< 3.39E-03 (MDA)	9.18E-03 ± 3.80E-03		
9/4/2014	< 3.28E-03 (MDA)	1.47E-02 ± 4.34E-03		
9/11/2014	< 3.37E-03 (MDA)	1.41E-02 ± 4.36E-03		
9/18/2014	2.34E-03 ± 1.87E-03	1.08E-02 ± 3.95E-03		
9/25/2014	< 3.48E-03 (MDA)	1.09E-02 ± 4.08E-03		
10/2/2014	< 3.34E-03 (MDA)	2.14E-02 ± 5.06E-03	< 8.44E-04 (MDA)	< 1.10E-03 (MDA)
10/9/2014	< 3.46E-03 (MDA)	1.23E-02 ± 4.23E-03		
10/16/2014	< 3.22E-03 (MDA)	1.01E-02 ± 3.78E-03		
10/23/2014	< 3.55E-03 (MDA)	9.60E-03 ± 3.98E-03		
10/30/2014	< 3.35E-03 (MDA)	4.52E-03 ± 3.13E-03		
11/6/2014	< 3.36E-03 (MDA)	1.61E-02 ± 4.58E-03		
11/13/2014	< 3.31E-03 (MDA)	2.00E-02 ± 4.90E-03		
11/20/2014	< 4.08E-03 (MDA)	1.02E-02 ± 4.47E-03		
11/26/2014	< 2.86E-03 (MDA)	9.25E-03 ± 3.39E-03		
12/4/2014	< 3.43E-03 (MDA)	1.21E-02 ± 4.18E-03		
12/11/2014	< 3.37E-03 (MDA)	6.31E-03 ± 3.41E-03		
12/18/2014	< 4.00E-03 (MDA)	6.66E-03 ± 3.92E-03		
12/24/2014	< 3.90E-03 (MDA)	1.18E-02 ± 4.54E-03		

Table C-7 (Continued)
ODCM REQUIRED AIR SAMPLES: HUMBOLDT HILL (STATION 3)

Sample Date	Alpha Activity (pCi/m^3)	Beta Activity (pCi/m^3)	Composite Gamma Activity (pCi/m^3)	
			Co-60	Cs-137
1/2/2014	< 3.35E-03 (MDA)	1.71E-02 ± 4.66E-03	< 5.28E-04 (MDA)	< 7.75E-04 (MDA)
1/9/2014	< 3.36E-03 (MDA)	9.81E-03 ± 3.86E-03		
1/16/2014	< 3.38E-03 (MDA)	1.90E-02 ± 4.89E-03		
1/23/2014	2.36E-03 ± 1.89E-03	2.77E-02 ± 5.65E-03		
1/30/2014	< 3.35E-03 (MDA)	3.47E-03 ± 2.97E-03		
2/6/2014	< 3.42E-03 (MDA)	< 6.15E-03 (MDA)		
2/13/2014	< 3.39E-03 (MDA)	< 6.10E-03 (MDA)		
2/20/2014	< 3.36E-03 (MDA)	1.05E-02 ± 3.95E-03		
2/27/2014	< 3.33E-03 (MDA)	5.19E-03 ± 3.21E-03		
3/6/2014	< 3.41E-03 (MDA)	7.45E-03 ± 3.59E-03		
3/13/2014	< 3.35E-03 (MDA)	< 6.03E-03 (MDA)		
3/20/2014	< 3.18E-03 (MDA)	6.95E-03 ± 3.35E-03		
3/27/2014	< 3.39E-03 (MDA)	< 6.10E-03 (MDA)		
4/3/2014	< 3.34E-03 (MDA)	7.65E-03 ± 3.57E-03	< 6.48E-04 (MDA)	< 6.52E-04 (MDA)
4/10/2014	< 3.40E-03 (MDA)	< 6.12E-03 (MDA)		
4/17/2014	< 3.29E-03 (MDA)	9.94E-03 ± 3.83E-03		
4/24/2014	< 2.38E-02 (MDA)	< 4.28E-02 (MDA)		
5/1/2014	< 3.28E-03 (MDA)	7.84E-03 ± 3.54E-03		
5/8/2014	< 3.49E-03 (MDA)	6.17E-03 ± 3.48E-03		
5/15/2014	< 3.25E-03 (MDA)	8.79E-03 ± 3.64E-03		
5/22/2014	< 3.49E-03 (MDA)	6.54E-03 ± 3.54E-03		
5/29/2014	< 3.31E-03 (MDA)	6.55E-03 ± 3.40E-03		
6/5/2014	< 3.45E-03 (MDA)	< 6.21E-03 (MDA)		
6/12/2014	< 3.23E-03 (MDA)	2.09E-02 ± 4.92E-03		
6/19/2014	< 3.47E-03 (MDA)	5.41E-03 ± 3.35E-03		
6/26/2014	< 3.40E-03 (MDA)	1.59E-02 ± 4.59E-03		
7/3/2014	< 3.40E-03 (MDA)	< 6.11E-03 (MDA)	< 8.23E-04 (MDA)	< 6.13E-04 (MDA)
7/10/2014	< 3.30E-03 (MDA)	< 5.94E-03 (MDA)		
7/17/2014	< 3.43E-03 (MDA)	< 6.17E-03 (MDA)		
7/24/2014	< 3.37E-03 (MDA)	< 6.07E-03 (MDA)		
7/31/2014	< 3.37E-03 (MDA)	4.20E-03 ± 3.09E-03		
8/7/2014	2.36E-03 ± 1.89E-03	8.05E-03 ± 3.63E-03		
8/14/2014	< 3.38E-03 (MDA)	< 6.08E-03 (MDA)		
8/21/2014	< 3.36E-03 (MDA)	< 6.04E-03 (MDA)		
8/28/2014	< 3.40E-03 (MDA)	< 6.12E-03 (MDA)		
9/4/2014	< 3.22E-03 (MDA)	1.51E-02 ± 4.35E-03		
9/11/2014	< 3.38E-03 (MDA)	1.16E-02 ± 4.08E-03		
9/18/2014	< 3.47E-03 (MDA)	6.85E-03 ± 3.56E-03		
9/25/2014	< 3.40E-03 (MDA)	7.08E-03 ± 3.53E-03		
10/2/2014	< 3.39E-03 (MDA)	1.30E-02 ± 4.24E-03	< 9.78E-04 (MDA)	< 9.13E-04 (MDA)
10/9/2014	< 3.38E-03 (MDA)	1.13E-02 ± 4.06E-03		
10/16/2014	< 3.33E-03 (MDA)	6.92E-03 ± 3.45E-03		
10/23/2014	< 3.44E-03 (MDA)	1.22E-02 ± 4.20E-03		
10/30/2014	< 3.34E-03 (MDA)	1.18E-02 ± 4.08E-03		
11/6/2014	< 3.25E-03 (MDA)	1.42E-02 ± 4.28E-03		
11/13/2014	2.43E-03 ± 1.94E-03	1.15E-02 ± 4.15E-03		
11/20/2014	< 4.02E-03 (MDA)	< 7.24E-03 (MDA)		
11/26/2014	< 2.91E-03 (MDA)	9.41E-03 ± 3.45E-03		
12/4/2014	< 3.37E-03 (MDA)	< 6.07E-03 (MDA)		
12/11/2014	< 3.47E-03 (MDA)	< 6.25E-03 (MDA)		
12/18/2014	< 3.96E-03 (MDA)	< 7.12E-03 (MDA)		
12/24/2014	< 3.84E-03 (MDA)	7.59E-03 ± 3.94E-03		

Table C-7 Notes

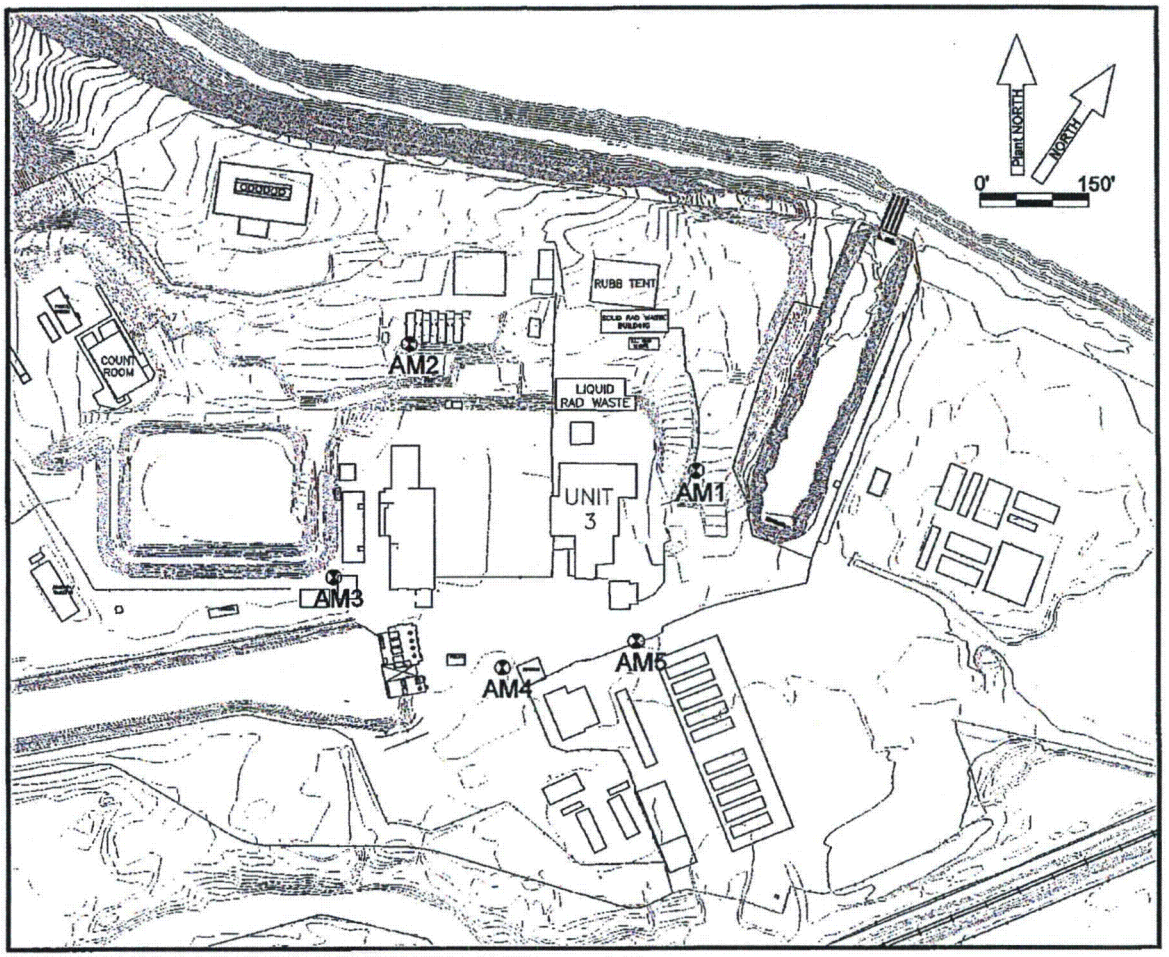
1. Composite samples for first, second, third and fourth quarter ODCM Air Samples were analyzed by gamma spectroscopy. Sample analyses were performed by HBPP count room personnel. All samples met the LLD requirements of 6.0E-02 pCi/m^3 for Cs-137.

2. All LLD's were met for Gross Beta (required LLD 1.0E-02 Ci/m^3) with the exception of the Humboldt Hill air sample collected on 4/25/2014. The air sample pump malfunctioned after running approximately 23 hours and 49 minutes. The beta MDA was determined to be 4.28E-02 pCi/m^3 instead of the required 1.0E-02 pCi/m^3 due to the low sample volume.

3. All samples reported as <MDA represent results that had no identified gamma peaks.

4. Humboldt Hill (Offsite) is also known as Station 3. East Fence is also known as AM1. Building 12 is also known as AM2. Annex Building is also known as AM3. Relay Building is also known as AM4. Oil Water Separator (O.W.S.) is also known as AM5.

FIGURE A-1
HBPP ONSITE AIR SAMPLE LOCATIONS

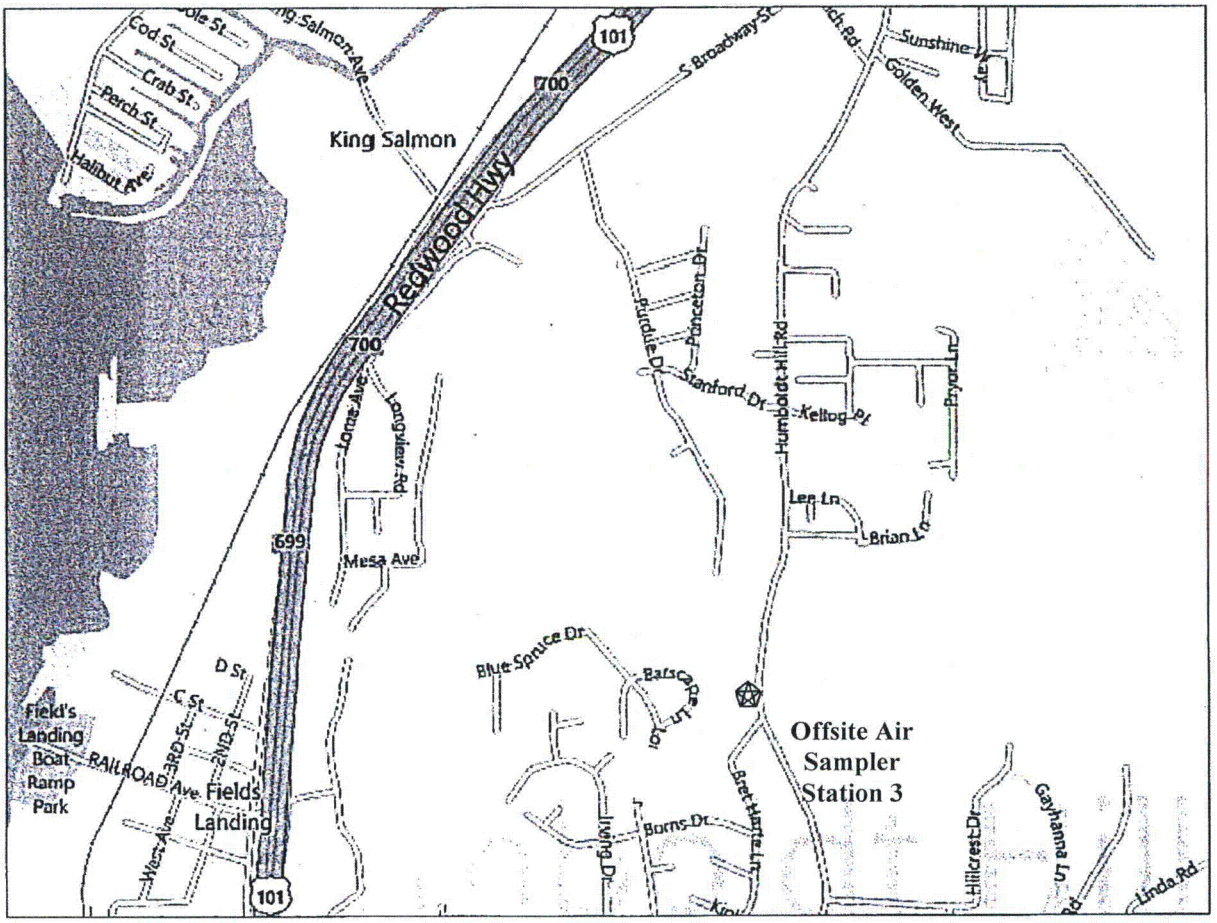


Location Number	GPS Coordinates (NAD83/NAVD88 CA. Zone 1)			HBPP (called north)	
	Easting	Northing	el.	East	North
AM1	5949518.63	2161208.89	20.68	5383.96	9299.72
AM2	5949091.47	2161143.20	33.05	4989.34	9475.92
AM3	5949177.71	2160817.45	11.29	4885.34	9155.45
AM4	5949441.54	2160838.93	11.36	5118.73	9030.56
AM5	5949576.07	2160969.08	11.94	5302.31	9067.06

Figure A-1 Note:

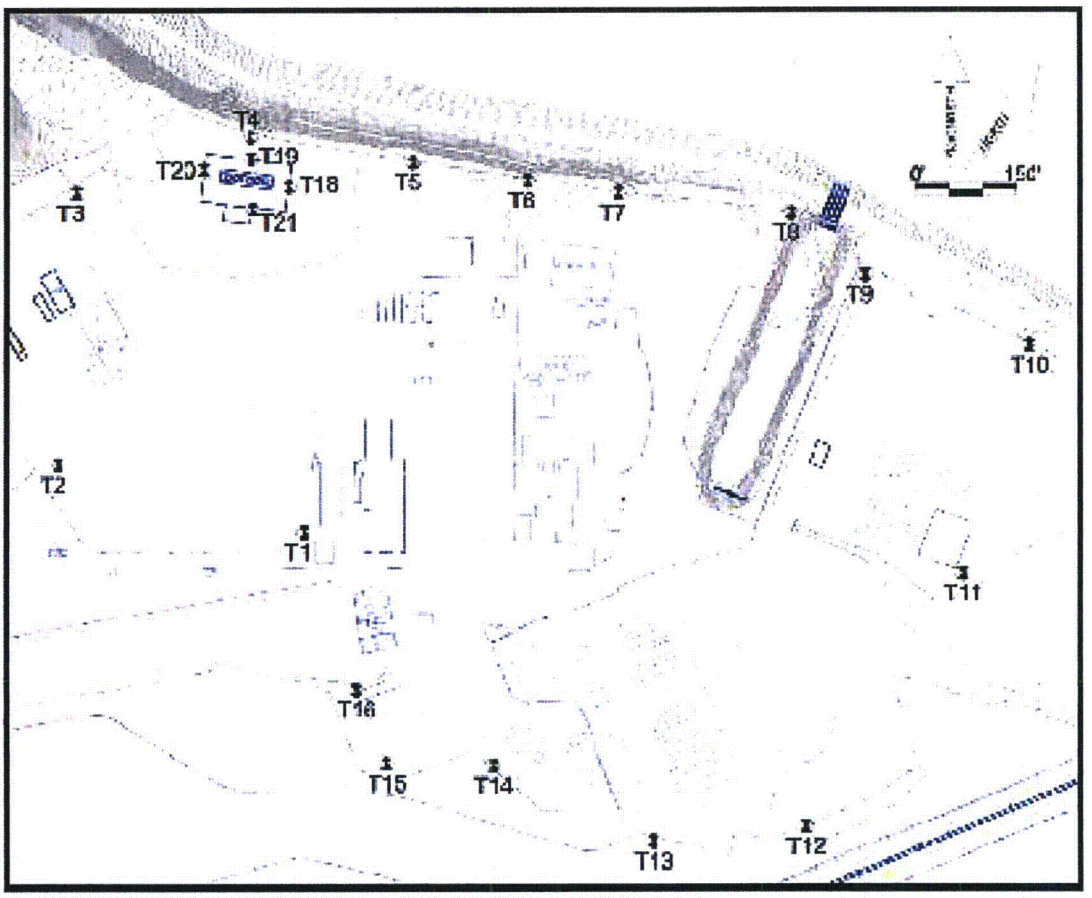
1. Humboldt Hill (Offsite) is also known as Station 3, East Fence is also known as AM1, Building 12 is also known as AM2, Annex is also known as AM3, Relay Building is also known as AM4, O.W.S. is also known as AM5.

FIGURE A-2
HBPP OFFSITE AIR SAMPLE LOCATION
HUMBOLDT HILL (Station 3)



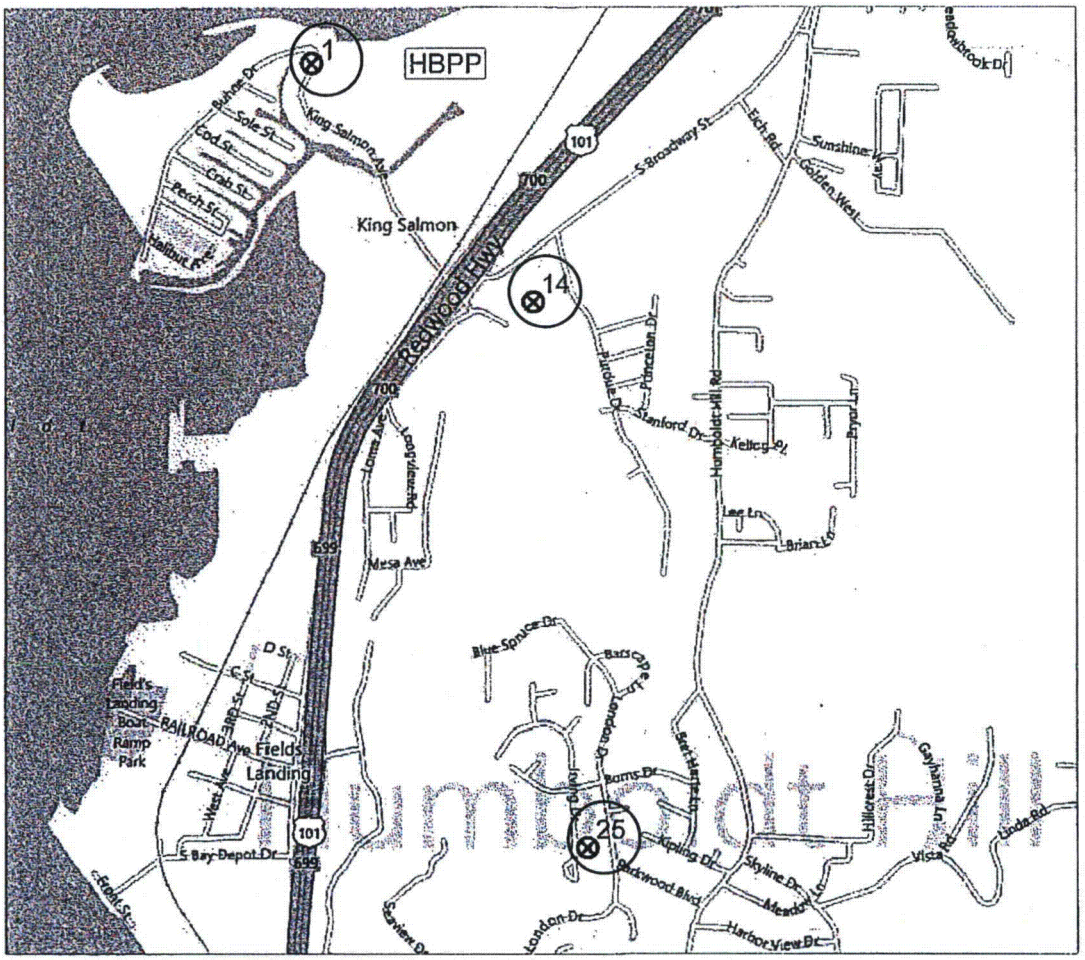
GPS Coordinates (NAD83/NAVD88 CA. Zone 1)			Degree.Decimal	
Easting	Northing	el.	Latitude	Longitude
5951260.28	2155706.11	234.94	40.72676	-124.20274

FIGURE A-3
HBPP ONSITE TLD LOCATIONS
Stations T1 – T21 (excluding T17)



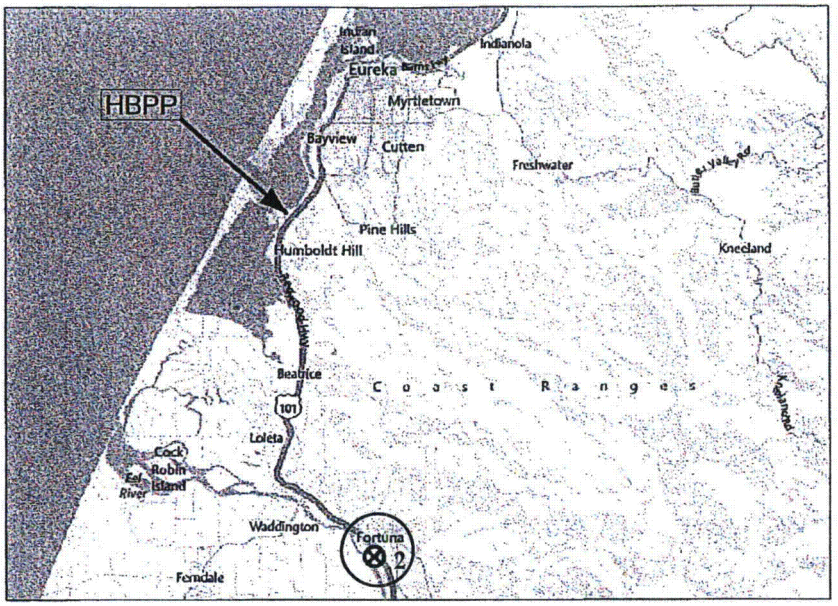
Location Number	GPS Coordinates (NAD83/NAVD88 CA. Zone 1)			HBPP (called north)	
	Easting	Northing	el.	East	North
T1	5949161.06	2160822.11	10.78	4873.87	9168.63
T2	5948804.52	2160710.72	11.56	4513.84	9268.18
T3	5948609.45	2161061.84	41.77	4540.12	9668.91
T4	5948778.72	2161269.91	43.66	4795.13	9752.07
T5	5949002.39	2161368.44	38.19	5036.50	9713.72
T6	5949159.22	2161437.55	36.30	5205.77	9696.84
T7	5949280.02	2161494.61	32.04	5338.22	9689.36
T8	5949511.99	2161608.36	12.96	5594.82	9639.33
T9	5949668.60	2161582.00	11.79	5701.27	9547.04
T10	5949912.89	2161633.96	11.17	5945.65	9443.64
T11	5950011.77	2161297.55	14.18	5946.48	9107.30
T12	5950019.25	2160858.44	11.25	5614.86	8734.19
T13	5949841.53	2160718.03	9.79	5389.40	8712.46
T14	5949583.98	2160684.24	10.46	5154.63	8823.60
T15	5949448.88	2160600.96	10.34	4995.96	8826.81
T16	5949352.82	2160667.18	10.80	4951.10	8934.52
T18	5948867.24	2161239.36	43.47	4852.98	9678.44
T19	5948796.71	2161242.74	42.84	4795.52	9719.50
T20	5948747.14	2161191.68	44.14	4726.20	9703.44
T21	5948834.52	2161182.89	45.71	4799.39	9644.52

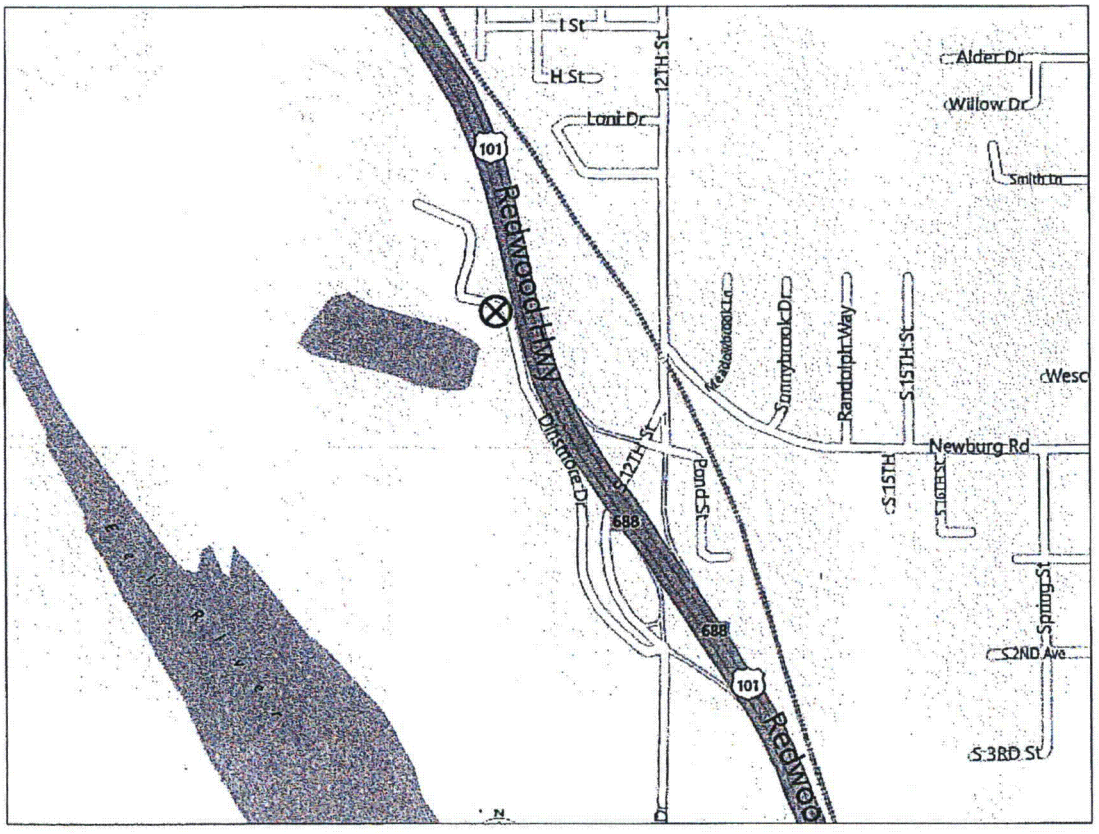
FIGURE A-4
HBPP OFFSITE TLD LOCATIONS
Stations (1, 14 & 25)



⊘	GPS Coordinates (NAD83/NAVD88 CA. Zone 1)			Degree.Decimal	
	Easting	Northing	el.	Latitude	Longitude
1	5948026.52	2161183.79	11.38	40.74156	-124.21903
14	5949876.83	2158864.39	18.65	40.73533	-124.20802
25	5950247.30	2154214.18	229.22	40.72260	-124.20626

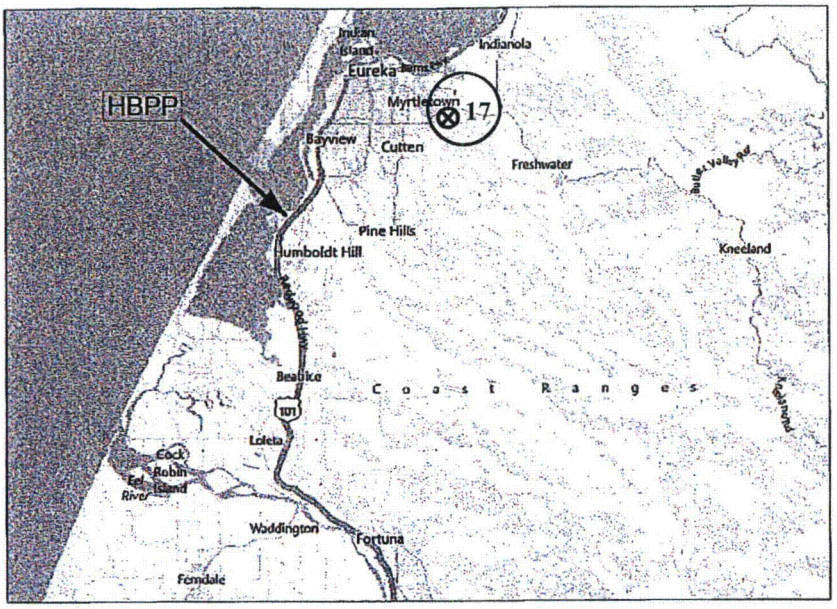
FIGURE A-4 (Continued)
HBPP OFFSITE TLD LOCATION
FORTUNA (Station 2)

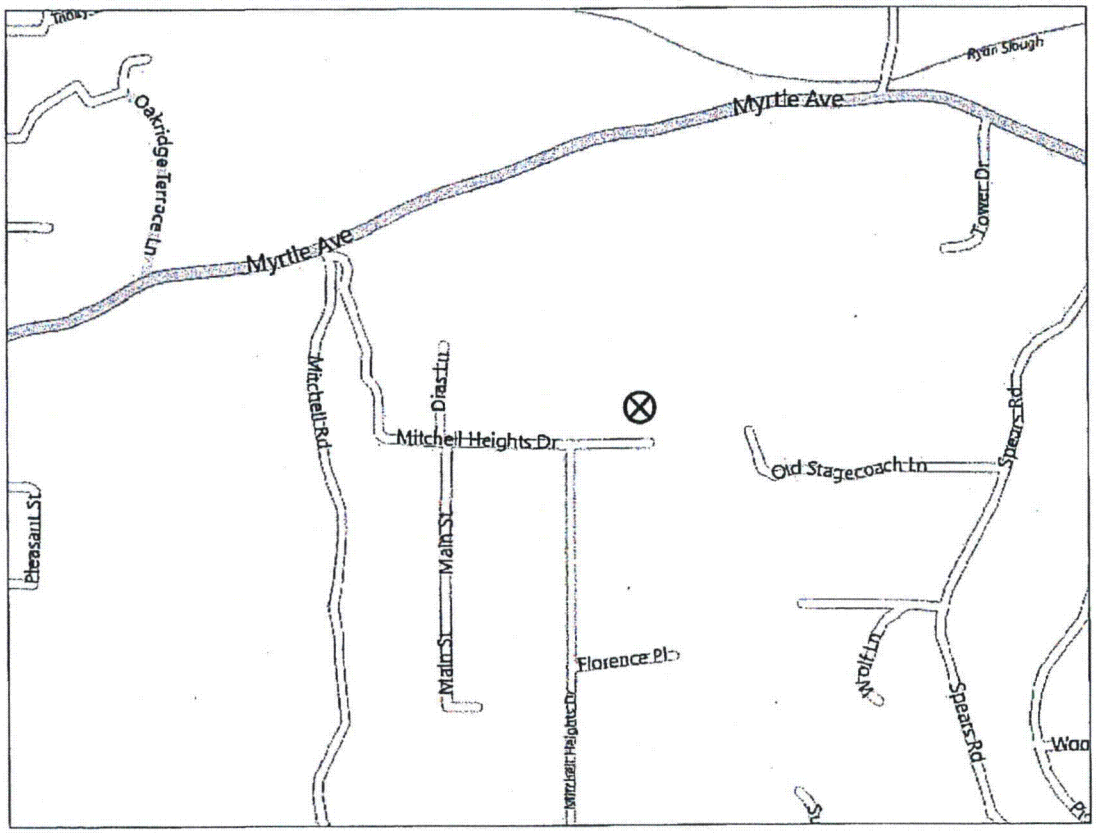




GPS Coordinates (NAD83/NAVD88 CA. Zone 1)			Degree.Decimal	
Easting	Northing	el.	Latitude	Longitude
5962583.86	2105797.82	35.53	40.59057	-124.15746

FIGURE A-4 (Continued)
HBPP OFFSITE TLD LOCATION
EUREKA (Control Location T17)





GPS Coordinates (NAD83/NAVD88 CA. Zone 1)			Degree.Decimal	
Easting	Northing	el.	Latitude	Longitude
5976549.55	2175490.19	164.85	40.78276	-124.11324

FIGURE A-5
HBPP GROUNDWATER SAMPLE POINTS

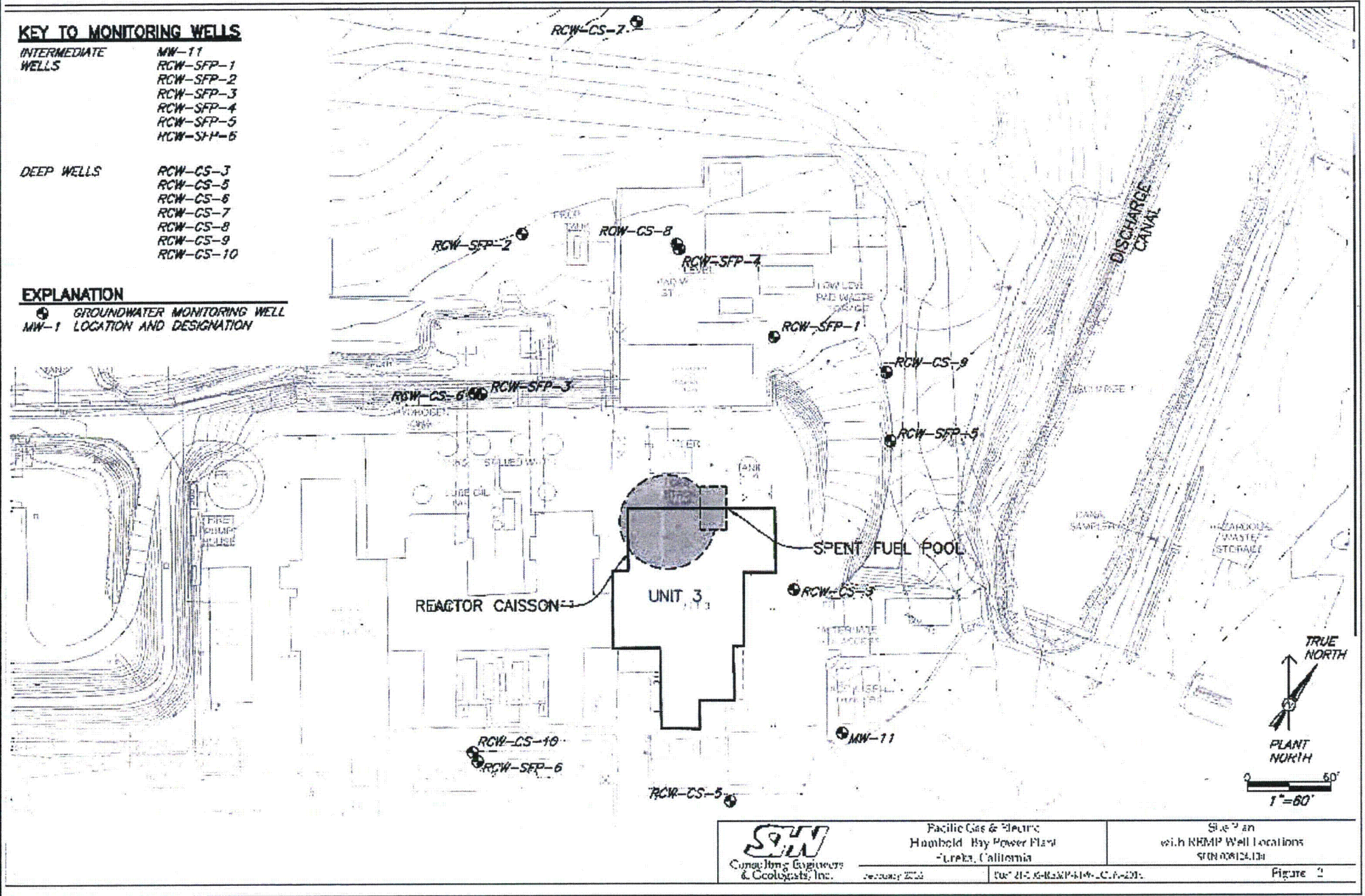
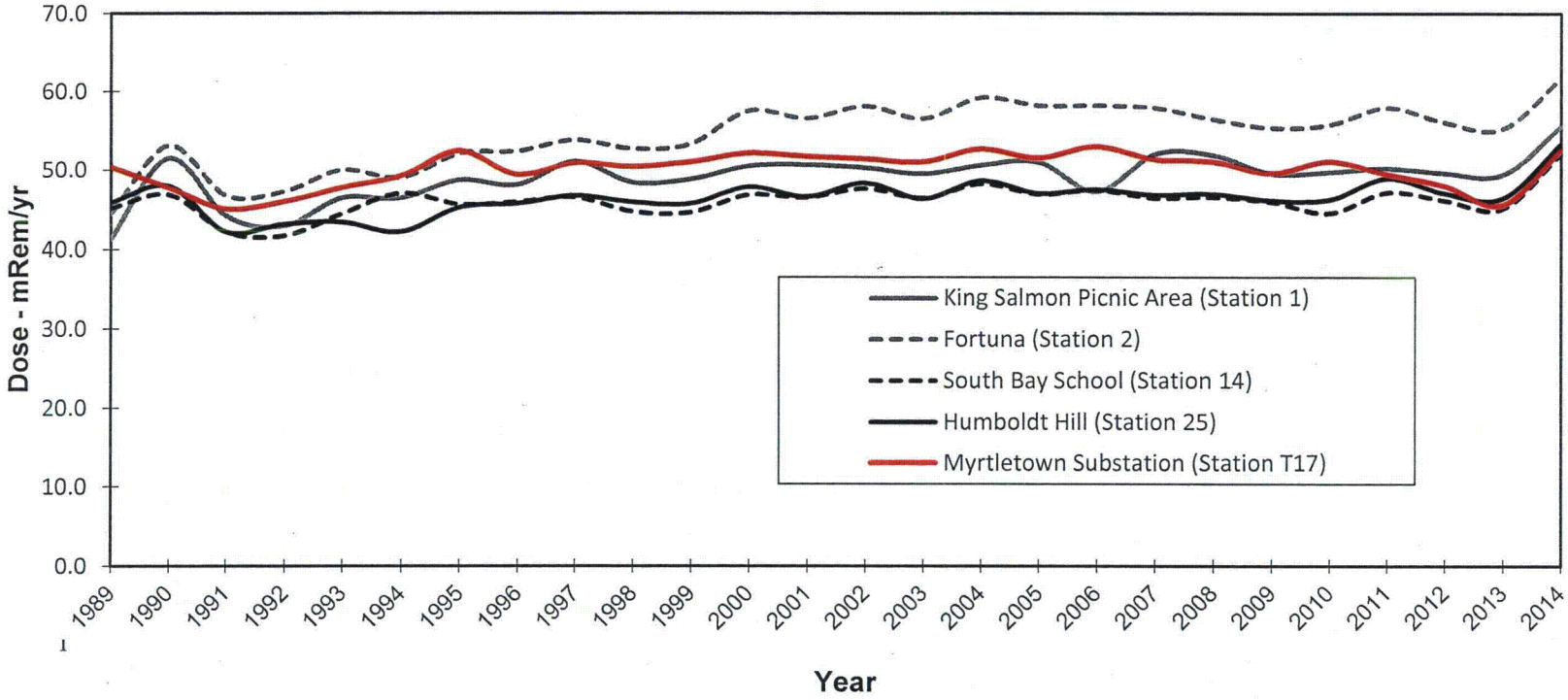
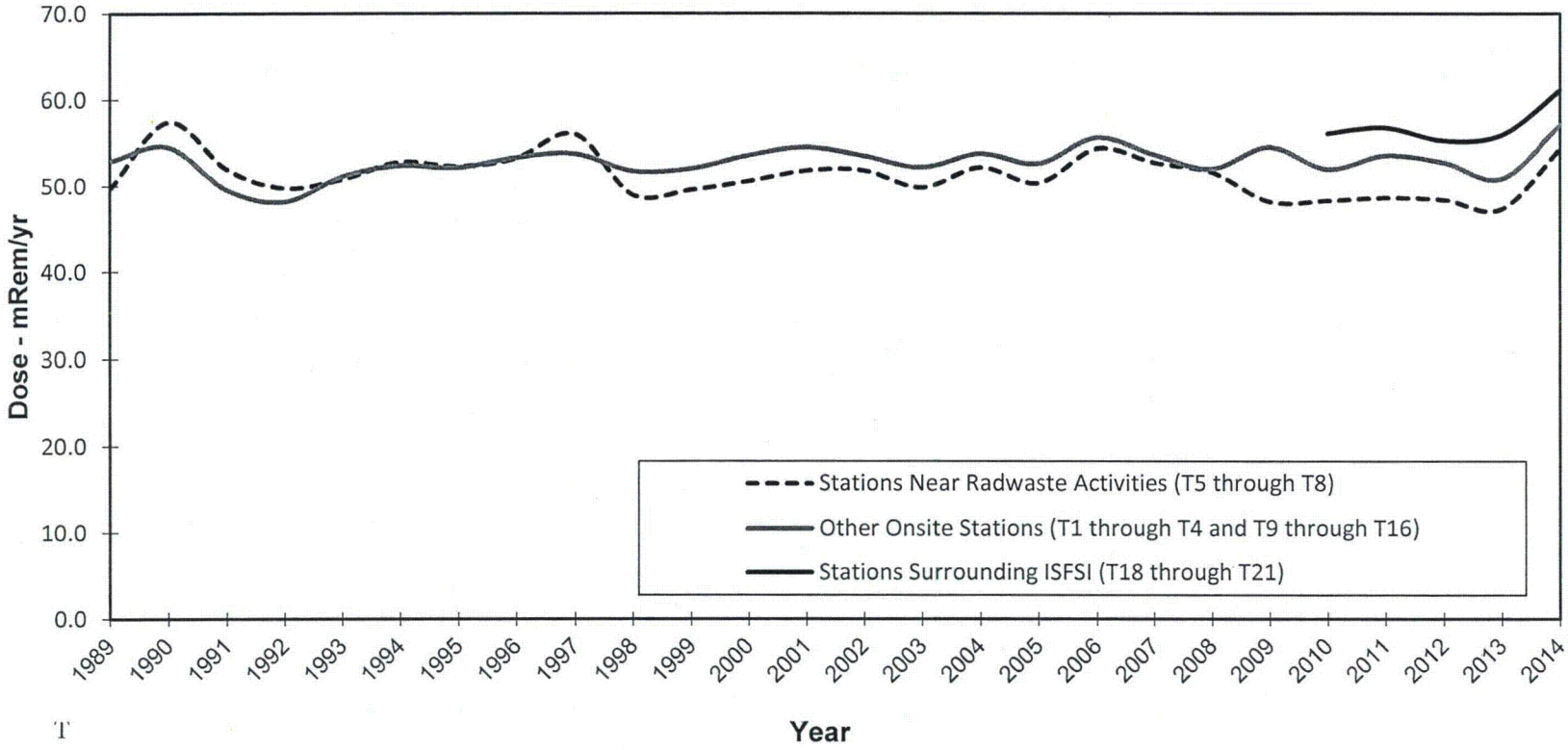


FIGURE B-1
OFFSITE ENVIRONMENTAL RADIATION LEVEL TRENDS



The baseline values s for each location were obtained by averaging the readings at each location from 1977 through 1983. These values, however, were obtained using ion chambers instead of TLDs. The average annual values from 1977 through 1983 were Station 1 – 83.0 mrem, Station 2 – 79.8 mrem, Station 14 – 80.2 mrem, and Station 25 – 73.7 mrem

FIGURE B-2
ONSITE ENVIRONMENTAL RADIATION LEVEL TRENDS



The baseline values for the two areas were obtained by averaging the readings for each area from 1977 through 1983. These values, however, were obtained using ion chambers instead of TLDs. The average annual value from 1977 through 1983 for the stations near the radwaste activities was 78.6 mrem and the average annual value for other onsite stations was 79.4 mrem.