Pacific Gas and Electric Company

James M. Welsch
Vice President, Nuclear Generation

Diablo Canyon Power Plant
P.O. Box 56
Avila Beach, CA 93424

805.545.3242
E-Mail: JMW1@pge.com

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PG&E Letter DCL-16-045

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

10 CFR 50, Appendix I

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
2015 Annual Radiological Environmental Operating Report

Dear Commissioners and Staff:

In accordance with Diablo Canyon Power Plant, Units 1 and 2, Technical Specification 5.6.2, "Annual Radiological Environmental Operating Report," Pacific Gas and Electric Company hereby submits the 2015 Annual Radiological Environmental Operating Report (AREOR). The AREOR contains material consistent with the objectives of the Offsite Dose Calculation Manual, and 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

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

If you have any questions regarding this submittal, please contact Mr. Martin Wright at (805) 545-3821.

Sincerely,

James M. Welsch

IE25
NRR

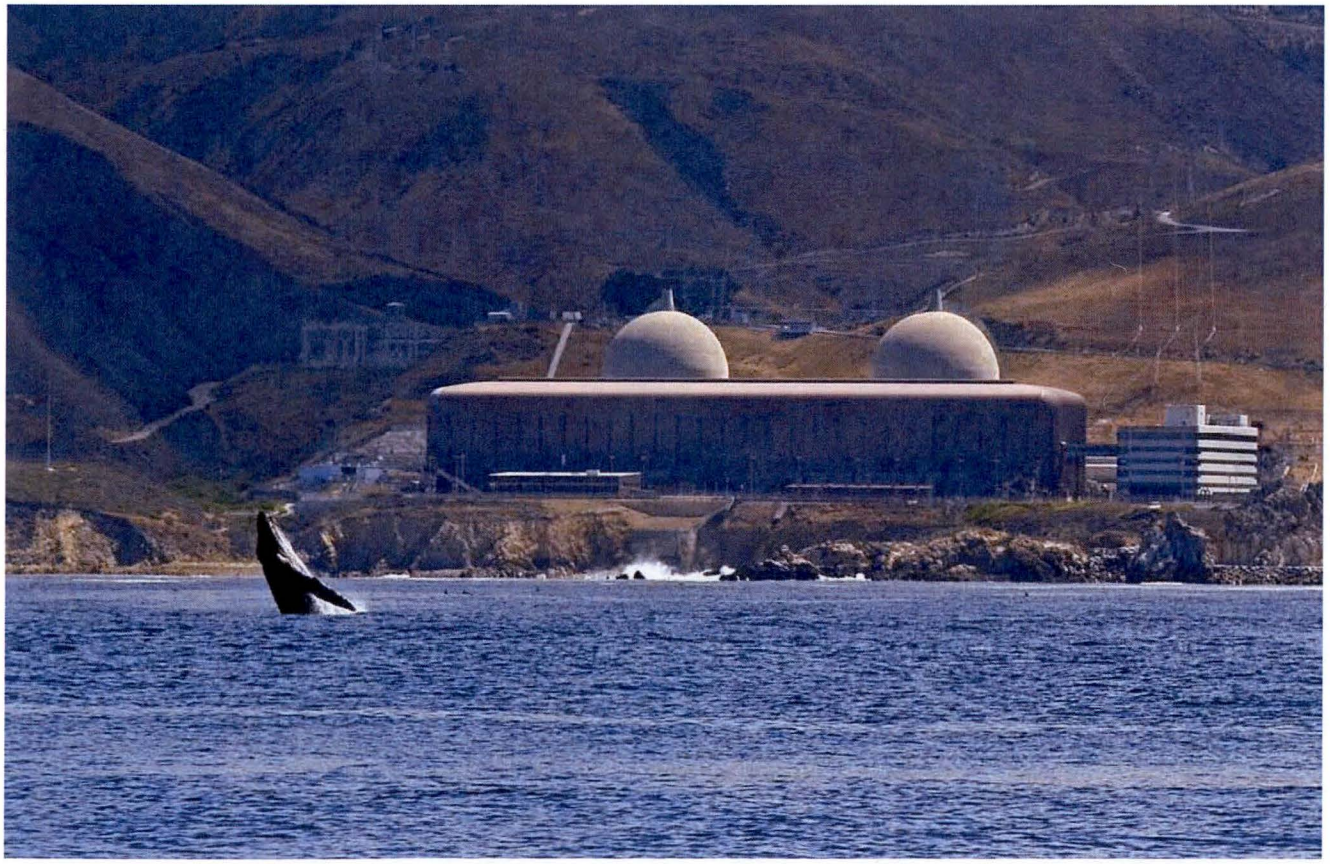
bnsm/4540/64124185
Enclosure
cc: Diablo Distribution
cc/enc: Larry Allen, Air Pollution Control Officer, San Luis Obispo County Air Pollution Control District
Penny Borenstein, San Luis Obispo County Health Officer
Marc L. Dapas, NRC Region IV Administrator
Kenneth A Harris Jr., Executive Officer, CRWQCB
Gonzalo L. Perez, Branch Chief, California Department of Public Health
John Reynoso, DCPP Acting NRC Senior Resident Inspector
Balwant K. Singal, NRC Senior Project Manager
Executive Officer, San Luis Obispo County Air Pollution Control District

Enclosure
PG&E Letter DCL-16-045

2015 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

2015 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant

January 1, 2015 - December 31, 2015



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2015 Diablo Canyon Power Plant

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
(AREOR)
January 1, 2015 - December 31, 2015

Prepared By
Pacific Gas & Electric Company
Diablo Canyon Power Plant

Prepared by: Martin Wright Date: 4/4/2016
Martin Wright, DCPP RP Senior Advising Engineer

Reviewed & Approved by: Tim Irving Date: 4/6/16
Tim Irving, DCPP Radiation Protection Manager

PG&E Submittal Letter DCL-16-045

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EXECUTIVE SUMMARY

This report contains results from the operational Radiological Environmental Monitoring Program (REMP) for Diablo Canyon Power Plant (DCPP) compiled for the period January 1, 2015 through December 31, 2015.

The purpose of the REMP was to assess the levels of radiation or radioactivity in the environment and to verify that DCPP was operating within its design parameters. This data was used to assure that plant effluents did not result in a significant radiological dose to offsite individuals.

Operation of DCPP continued to have no detectable offsite radiological impact. Samples analyzed from the offsite sampling stations continued to show no radiological contribution from plant operations.

The offsite radiological doses received by the general public from plant operations were less than one millirem (mr) annually which is insignificant when compared to the 310 millirem average annual radiation exposure to people in the United States from natural radiation sources (e.g. cosmic, terrestrial, radon, etc).

More than 260 environmental samples, 880 air samples, and 1400 thermo luminescent dosimeter (TLD) phosphors were collected over the course of the 2015 REMP monitoring period. Approximately 1782 radionuclide analyses were performed on the environmental samples.

The REMP was conducted in accordance with DCPP Program Directive CY2, "Radiological Monitoring and Controls Program," and RP1.ID11, "Environmental Radiological Monitoring Procedure." This report was submitted per DCPP License Technical Specification 5.6.2.

The types of samples (matrix ID) collected for this monitoring period were as follows:

Air Particulate (AP)	Air Cartridges (AC) for iodide monitoring		Carbon-14 (AC14)
Direct Radiation (TLD)	Milk (MK)	Meat (MT)	Vegetation (VG)
Drinking Water (DW)	Ground Water (GW)	Monitor Well (GW)	Surface Water (SW)
Aquatic Vegetation (AV)	Fish (FH)	Mussels (IM)	Sediment (SD)

The ambient direct radiation levels in the DCPP offsite environs did not change and were within the pre-operational background range.

The ambient onsite direct radiation levels within the DCPP plant site boundary near the ISFSI were elevated due to dry cask spent fuel storage. The remaining onsite REMP environmental TLD locations were not affected by the ISFSI due to ISFSI topographical elevation and placement within an onsite hillside which provided shielding to the rest of the site.

An evaluation of direct radiation measurements and member of public occupancy times within the site boundary indicated all federal criteria for member of public dose limits (10CFR20.1301) were conservatively met. An evaluation of direct radiation measurements indicated all federal EPA 40CFR190 criteria were conservatively met.

Groundwater isotopic monitoring was conducted in accordance with the nuclear industry NEI 07-07 Groundwater Protection Initiative (GPI). Concentrations of tritium were detected in three shallow monitoring wells (stations OW1, DY1, and GW1) near the power block. This tritium was evaluated and attributed to rain-washout of gaseous tritium exiting the plant vent system (via an approved isotopic-effluents discharge path). No groundwater tritium has been attributed to DCPP system leaks or spills. It should also be noted that studies of the DCPP site groundwater gradient indicated that any groundwater (subsurface) flow beneath the DCPP power block was not used as a source of drinking water. Due to topography and site characteristics, this groundwater gradient flow discharged into the Pacific Ocean which is approximately 100 yards from the power block.

An Old Steam Generator Storage Facility (OSGSF) long term storage mausoleum was constructed within the DCPP site boundary in 2007 for storage of eight retired DCPP steam generators and two retired DCPP reactor heads. This OSGSF did not cause any changes to the ambient direct radiation levels within the DCPP environs during 2015. The OSGSF in-building sumps were inspected quarterly by REMP personnel. These OSGSF sumps have remained empty and dry during 2015.

The results of the 2015 REMP showed no unusual environmental isotopic findings from DCPP site operations. These results were compared to DCPP preoperational isotopic data and showed no unusual trends.

Diablo Canyon site operations had no significant environmental radiological impact on airborne, surface water, drinking water, marine life, aquatic vegetation, terrestrial vegetation, sediment, milk, or meat radioactivity.

TABLE OF CONTENTS

Photograph credits: Tom Hook, John Lindsey, and Martin Wright

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LIST OF TABLES

LIST OF FIGURES

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1.0 INTRODUCTION

Diablo Canyon Power Plant (DCPP) consists of two Westinghouse pressurized water reactors (PWR). Unit 1 began commercial operation in 1985, and Unit 2 began commercial operation in 1986.

The purpose of the Radiological Environmental Monitoring Program (REMP) is to verify that Diablo Canyon Power Plant (DCPP) is operating within its design parameters and to assure that plant effluents do not result in a significant radiological dose to offsite individuals.

Operation of DCPP continues to have no detectable radiological impact offsite. Samples analyzed from the offsite sampling stations continue to show no radiological contribution from plant operations. The annual radiological doses received by the general public from plant operations were less than one millirem (mr) which is insignificant when compared to the 310 millirem average annual radiation exposure to people in the United States from natural radiation sources (e.g. cosmic, terrestrial, radon, etc).

This Annual Radiological Environmental Operating Report (AREOR) summarized the findings of the REMP conducted by DCPP. The remainder of this AREOR was organized as follows:

Section 2: Provided a description of the overall REMP design. Included was a summary of the requirements for REMP sampling and tables listing routine sampling and TLD monitoring locations with distances from the plant. Tables listing Lower Limit of Detection requirements and Reporting Levels (NRC notification if levels exceeded) were also included.

Section 3: Consisted of the summarized data as required by the Radiological Environmental Monitoring Program. The summaries were provided similar to that specified by the NRC Branch Technical Position on Environmental Monitoring.

Section 4: Provided a summary of the results for the samples collected. The performance of the program in meeting the requirements was discussed, and the data acquired during the monitoring period was analyzed. Also included was environmental TLD preoperational data trending.

Section 5: Provided a summary of groundwater monitoring in accordance with the nuclear industry NEI 07-07 Groundwater Protection Initiative.

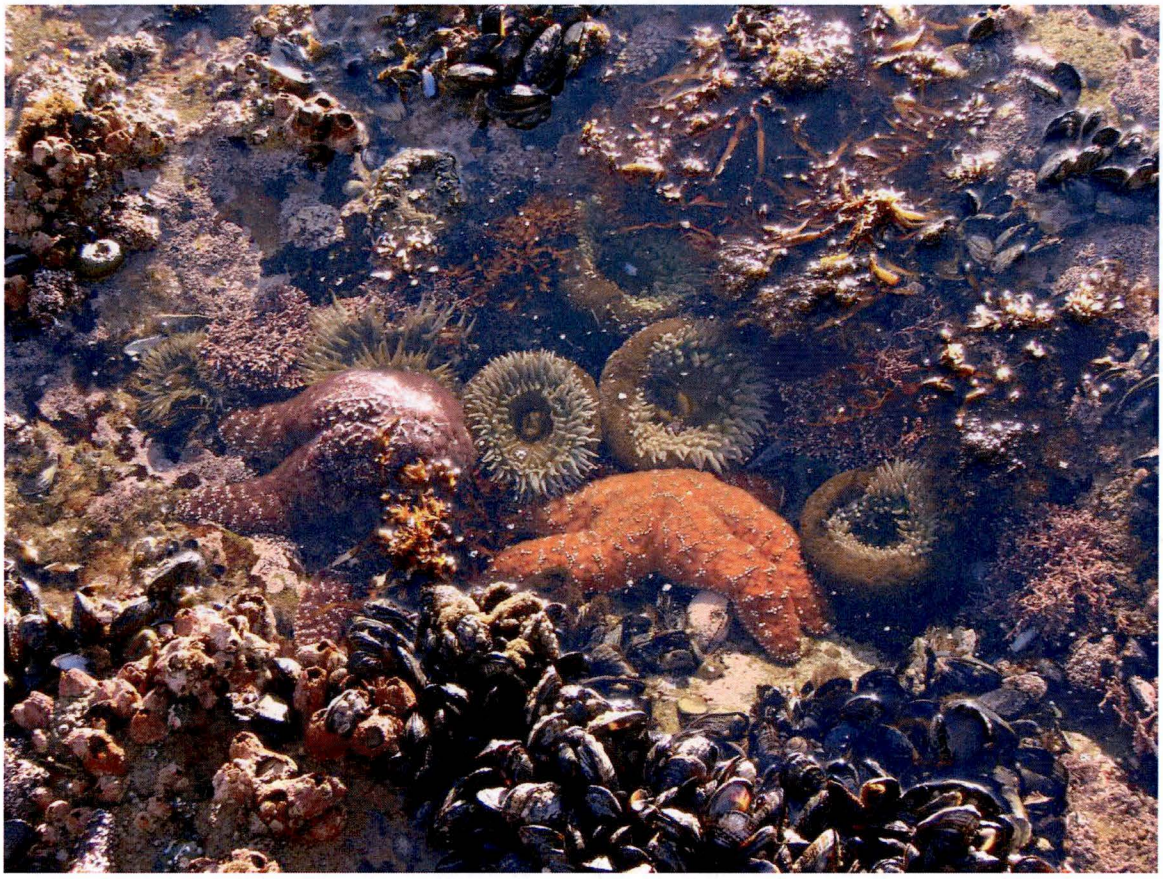
This and previous DCPP AREOR's can be found on the NRC website at:
http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html

DCPP REMP sent replicate split samples of stations 7G1 vegetation (quarterly), 5F2 milk (monthly), 5S2 drinking water (monthly), DW1 drinking water (monthly), OUT seawater (monthly), DCM kelp (quarterly), DCM perch (quarterly), DCM rockfish (quarterly), and DCM ocean sediment (annually) to the California Department of Public Health - Radiologic Health Branch (CDPH-RHB) Laboratory as part of a California State split sampling program.

These split samples were independently analyzed by the CDPH-RHB.

Other pathways independently monitored by the CDPH-RHB were quarterly direct radiation TLD stations (MT1, 1A1, 1C1, 4D1, 5F3, 5S1, 7D1, 7C1, 7F1, and 8S2) and weekly air sampling particulate and I-131 (at stations 5F3 and 7D1).

The general public can access these CDPH-RHB split sampling data results via the internet at:
http://www.cdph.ca.gov/programs/Pages/RHB-RadReport.aspx



2.0 PROGRAM DESIGN

The Radiological Environmental Monitoring Program (REMP) for the Diablo Canyon Power Plant (DCPP) was designed with the following specific objectives in mind. These objectives continue to be in force, to varying degrees, throughout facility operation:

- To provide an early indication of the appearance or accumulation of any radioactive material in the environment caused by facility operation. Preoperational data was also used in this comparison.
- To provide assurance to regulatory agencies and the public that the station's environmental impact was known and within anticipated limits.
- To provide standby monitoring capability for rapid assessment of risk to the general public in the event of unanticipated or accidental releases of radioactive material.

The environmental media selected were based on the critical dose pathways of the radionuclides from the environment to man. They included the following: direct radiation, air, water, fish, ocean sediment, and invertebrates. Supplemental samples such as algae, kelp, local agricultural crops, recreational beach sand,

groundwater, meat, and milk were also collected. The sampling locations were determined by land use, site meteorology, and local demographics. Guidance for this monitoring program was provided by the Radiological Assessment Branch Technical Position on Radiological Environmental Monitoring, Revision 1, November 1979 (NUREG-1301).

Radiological Environmental Monitoring Program (REMP) samples were collected by DCPP REMP personnel and sent to General Engineering Labs (GEL) in Charleston, South Carolina for isotopic analysis.

Fish (except market fish) and ocean sediment samples were collected by contract divers of Tenera Environmental and given to DCPP REMP personnel for shipment to GEL.

Market fish samples were collected by local commercial fishermen and then purchased by DCPP REMP personnel in one of two local fish markets for shipment to GEL.

Environmental direct radiation analyses were conducted by the use of thermo-luminescent dosimeters (TLD). Environmental TLD analysis was conducted by Mirion Technologies in Irvine California.

The detailed sampling requirements of the REMP were given in Table 2.1 of this report.

Data summary tables of REMP sampling for the period were shown in section 3 of this report.

Any deviations from the REMP sampling schedule / requirements were documented in section 4 of this report.

Direct dose (environmental TLD) results were shown in section 4 of this report.

Individual REMP sample isotopic results were shown in Appendix A of this report. Detected concentrations (> MDC) of nuclear power plant related isotopes have been highlighted with yellow background for quick identification by the reader. Naturally occurring isotopes (e.g. NORM) were not highlighted (including gross beta, Be-7, K-40, thorium, radium, radon, lead, etc).

2.1 MONITORING ZONES

The REMP was designed to allow comparison of levels of radioactivity in samples from the areas possibly influenced by DCPP to levels found in areas not influenced by the facility operations. Areas with the potential to be influenced by facility operations were called "indicator" stations. Areas with sufficient distance from the plant that were not likely to be

influenced by facility operations were called "control" stations. The distinction between the two zones was based on distance and relative direction from the plant. Analysis of survey data from the two zones aided in determination of site environmental influence. Analysis from the two zones assisted in differentiation between radioactive releases and seasonal variations in the natural environmental background radioactivity.

2.2 PATHWAYS MONITORED

Direct Radiation
Airborne Radioactivity
Waterborne Pathways
Marine Biological, Beach Sand, and Ocean Sediment
Food Crops
Milk
Meat

2.3 DESCRIPTIONS OF REMP MONITORING

2.3.1 Direct Radiation

Direct ambient radiation was measured at 32 stations in the vicinity of DCPP using Panasonic UD814 TLD badges. The TLD badges had valid element correction factors (ECF), were calibrated using a NIST-traceable caesium-137 source, were annealed prior to placement, and were sealed in watertight packaging. Three TLD badges were placed at each station and each badge contained 3 calcium sulfate phosphors for a total of 9 calcium sulfate phosphors at each station. The 9 phosphors were analyzed and averaged to provide a single station reading. That single reading was converted into an uR/hr doserate dependent on the in-field exposure time period. Then the uR/hr doserate was converted and reported into millirem (mr) per standard (91 day) quarter. These TLD badges were exchanged and processed on a quarterly basis.

Direct ambient radiation was measured at 8 stations in the vicinity of the Independent Spent Fuel Storage Installation (ISFSI) using Panasonic UD814 TLD badges. The ISFSI TLD badges were processed in the same method described in the previous paragraph.

The Env TLD badge packets were distributed and collected from the field stations by DCPP REMP personnel and then shipped to Mirion Technologies for processing. Control badges accompanied the field badges during shipment and deployment to measure any non-station dose received during transit time periods. Control badge exposure was subtracted from field badge exposure. Env TLD exposure was reported over a standard 91 day quarter.

DCPP Environmental TLD standard quarter results were measurements of all environmental gamma radiation sources (cosmic, terrestrial, radon, man-made, etc) at each station during the deployment period.

2.3.2 Airborne Radioactivity

Air particulate and radioiodine sampling were performed weekly at six indicator stations: MT1, 0S2, 1S1, 7D1, 8S1 and 8S2. Air particulate and radioiodine sampling was performed weekly at one control station: 5F1.

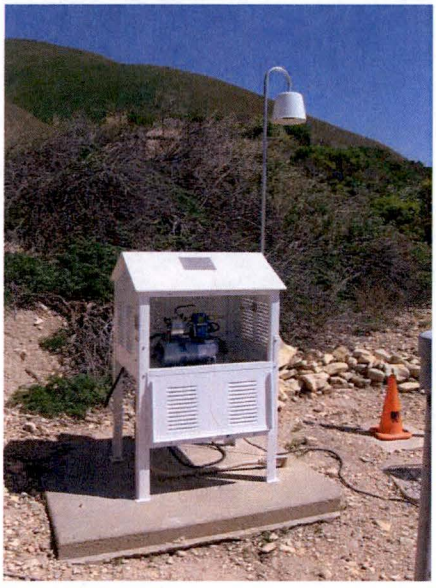
Constant flow air samplers (F&J model DF-1) were used to draw air through paper filters to collect air particulates and through triethylenediamine (TEDA) impregnated charcoal cartridges to collect radioiodine. The air sampling flow rate was conducted at approximately 2.55 cubic meters per hour. The air sampling collection filters were located approximately seven feet above the ground. The sample volumes were determined by F&J Corporation model DF-1 flow meters (corrected to standard temperature and pressure, STP) which were installed downstream of the sample filters. At the end of the weekly sampling period, the particulate filter and TEDA charcoal cartridge were collected. All necessary data regarding the air volume readings, flow rate, sampler time on / off, date of collection, and sampler station location were recorded and submitted to GEL along with the filter samples for isotopic analysis.

Approximately 72 hours after sampling (to allow for radon and thoron daughter decay), the particulate filter papers collected from the field were placed on individual planchets and counted for gross beta activity in a low background, thin window gas proportional counter.

Quarterly gamma spectroscopy isotopic analysis was performed on composites of

the filters (by station) to determine the activity concentration of gamma emitting isotopes. The quarterly composite sample time is reported at the midpoint of the quarter monitored.

Due to the short half-life of Iodine-131, each station weekly TEDA impregnated charcoal cartridge was counted for gamma spectroscopy isotopic analysis to determine the radioiodine concentration.



2.3.3 Airborne Carbon-14

Air Carbon-14 (C-14) supplemental sampling was performed weekly at stations 0S2 (northwest sector), 8S1 (southeast sector), and 5F1 (control station in San Luis Obispo) throughout 2015.

General Engineering Labs (GEL) and DCPP REMP worked together to develop a method for sampling environmental airborne inorganic C-14. Inorganic C-14 (as CO_2) is the primary exposure pathway to man via photosynthesis in plants. A constant flow air sampler was used to draw air through a solid phase carbon sensitive sorbent cartridge. The air sampler was set at a flow rate of 1.0 standard liter per minute. The air sample filter cartridge head was located approximately seven feet above the ground. At the end of the weekly sampling period, the filter cartridge was collected. All necessary data regarding the air volume, flow rate, sampler time on / off, date of collection, and sampler station location were

recorded and submitted to GEL along with the sample filter for C-14 analysis. At GEL, a suitable portion of the solid sorbent material was processed through a method utilizing wet oxidation to remove volatile CO_2 from the media in a closed distillation system. Once removed from the media, C-14 as carbon dioxide was sparged through a dilute acid solution for trapping any tritiated water present in the sample. After sparging through dilute acid, the CO_2 was trapped in a sorbing solution which was added to liquid scintillation cocktail and finally counted in a liquid scintillation counter. It should be noted that C-14 results in Appendix C are reported in uCi/cubic meter. This method met the following specifications:

- Validated to retain 99.9% of inorganic C-14 in air
- Validated at collection rates of approximately 1.0 liter per minute
- Validated for total collection capacity over a 1 week sampling interval
- Accurate analysis of C-14 over a wide range of concentrations
- Methodology free from interference by other radionuclides
- Detection capability of approximately 0.8 pCi (8E-7 uCi) per cubic meter

2.3.4 Waterborne

Water samples (drinking water, surface water, monitor wells, and groundwater) were collected at the frequencies shown in Table 2.1

Ocean surface water samples were collected at Diablo Cove (station DCM), Rattlesnake Canyon (station 7C2), and at the plant Outfall (station OUT).

Drinking water samples were collected from Diablo Creek Weir (station 5S2), Diablo Creek Outlet (station WN2), Blanchard Spring (station 1A2), and from the DCPP drinking water system (station DW1). San Luis Obispo (SLO) city drinking water was also collected from a control station located at 4325 South Higuera Street, Offsite Emergency Lab (station OEL) in SLO.

Supplemental groundwater samples were collected from Water Well 02 (WW2) and DCSF96-1 (8S3).

Supplemental on-site monitoring well samples were collected from french drain systems labeled Observation Well 01 (OW1), Observation Well 02 (OW2), and

Drywell 115 (DY1). These shallow French drain well systems were located in close proximity to the facility power block structures and within the protected area.

Two new on-site monitoring wells were installed in December 2011 as part of the industry Groundwater Protection Initiative (GPI). Isotopic sampling of these wells was initiated in 2012. These two new onsite wells were downgradient of the power block and located along the west side of the power block. These two new monitoring wells were labeled Groundwater 1 (GW1) and Groundwater 2 (GW2).

After collection, the samples were securely sealed and labeled with sample type, station ID, date, time of collection, person performing the collection and sent to GEL for analysis.

2.3.5 Marine Biological, Beach Sand, and Ocean Sediment

The REMP required sampling of rockfish (genus Sebastes), perch (family Embiotocidae), mussels (genus Mytilus), and ocean sediment from indicator station DCM and control station 7C2.

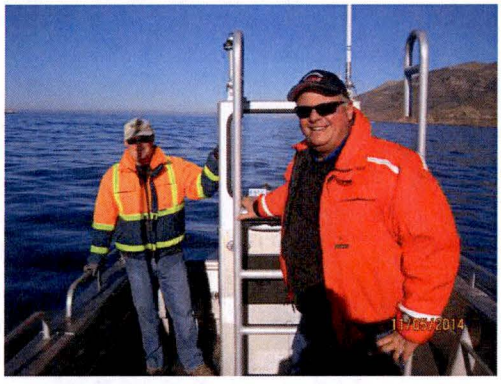
All other marine samples collected were considered supplemental. These supplemental marine samples included the following: intertidal algae, intertidal mussels, kelp, rockfish, perch, beach sand, and market fish. The intertidal samples were collected by DCPP personnel during low tidal conditions. Kelp was collected quarterly by DCPP personnel from the offshore kelp bed in the vicinity of the site.

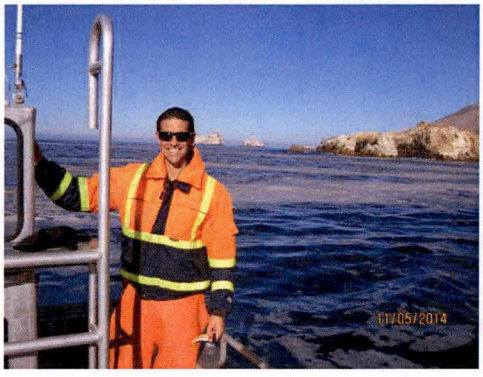
Quarterly samples of fish and annual samples of ocean sediments were collected from the plant environs by contracted divers (TENERA Environmental). The Tenera divers fillet the fish and leave a small portion of skin for identification. Only edible portions of the fish were analyzed (fish fillets).

Beach sand was collected by DCPP personnel between the high and low tide boundaries at nearby recreational beaches.

Market Fish caught locally by commercial fishermen were purchased from two local fish markets (Avila Beach Pier-7D3 and Morro Bay-2F1).

All samples were subject to unavailability due to seasonal fluctuations or unfavorable sampling conditions. The above samples were sealed in plastic bags immediately upon collection. In-shell mussels were sent to GEL where GEL personnel removed the meat & internal organs for analysis. The samples were labeled with sample type, station ID, date, time of collection, and the individual who performed collection. The samples were then frozen (to prevent spoilage odor) before they were shipped to GEL for analysis.





2.3.6 Food Crops

The REMP required broadleaf food vegetation collected in the nearest off-site locations of the highest calculated annual average ground level D/Q (dispersion parameter) within 5 miles. There was no broadleaf food vegetation available that satisfied this requirement. Because these food products were unavailable, the DCPP REMP conducted additional weekly air sampling in the SE (station 8S2) and NNW (station 1S1) sectors.

Additional representative samples of food crops (in season) were collected monthly from supplemental stations: Cal Poly Farm (5F2), Kawaoka Farm in Arroyo Grande (7G1), Mello Farm (7C1) along the DCPP site access road, and quarterly from local gardens (3C1, 6C1, and 7E1).

The vegetation samples at 5F2, 7G1, 7C1, 3C1, and 7E1 were collected by DCPP personnel and sealed immediately in plastic bags. The quarterly garden vegetation sample at 6C1 was provided to DCPP personnel by the land occupant (due to difficulty of property access and occupant requested privacy).

The samples were labeled with sample type, station ID, collection date, collection time, and the individual who performed collection. The samples were normally frozen before they were shipped to GEL for analysis (to prevent spoilage odor).

2.3.7 Milk

There were no animals within the 5 mile vicinity of the plant utilized for milk consumption by humans. However, supplemental samples of cow milk were collected monthly from Cal Poly Farm (5F2) which was approximately 13 miles from DCPP.

Two 1-gallon plastic containers of milk were collected each sampling period by DCPP personnel. Forty grams of sodium bisulfite preservative were added to each gallon of milk sample. The containers were sealed and shaken thoroughly to distribute the preservative. The containers were labeled with sample type, station ID, collection date, collection time, and the individual who performed collection. The samples were then express-shipped (due to the short half-life of I-131) to GEL for analysis.

2.3.8 Meat

A rancher routinely grazed (free range, grass fed) cattle within three miles of the site boundary between the northwest to east sectors (clockwise). This livestock meat would then be offered at local farmer's markets and private distribution. Because it was possible for this vendor to provide an individual's sole-source of annual meat consumption, this meat sampling was included in the REMP. REMP personnel obtained commercially packaged meat samples directly from the land owner. Gamma spec and total strontium 89/90 analyses were performed on the meat.

Control station free range, grass fed meat sampling was conducted of ranches outside the influence of DCPP. This meat was purchased by REMP personnel from the Whole Foods Market in SLO. The control station meat consisted of Hearst Ranch meat which is located approximately 37 miles north of the DCPP site. This REMP station code was CCM (Control Cow Meat) and provided a control meat sample location far from the site.

Property owners could hunt deer and wild pig (in season) within 5 miles of the site boundary. The REMP could not obtain deer meat samples from these property owners (voluntary participation) in 2015. Gamma spec and strontium analyses were performed on the deer meat if provided.

The meat was initially packaged by the livestock owners or commercial processes. The meat was purchased at local grocery stores or turned over to REMP personnel by the land owners. The unopened packages were then separated by species and placed into large over-pack zip-lock bags. Each bag was labeled with sample type, station ID, collection date, collection time, and the individual who performed the collection. The samples were then frozen and shipped to GEL for isotopic analysis.

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TABLE 2.1:
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
1. Direct Radiation[2]	Thirty-two routine monitoring stations containing thermo luminescent dosimeters (TLDs) such that at least two (2) phosphors are present at each station, placed as follows:				
	An inner ring of stations, one in each terrestrial meteorological sector in the general area of the SITE BOUNDARY;	0S1, 0S2, WN1, 1S1, 2S1, 3S1, 4S1, 5S1, 6S1, 7S1, 8S1, 9S1, 8S2, 5S3, and MT1	Quarterly	Gamma Dose	Required
	An outer ring of stations, one in each terrestrial meteorological sector in the 2.5 to 14 km range from the site; and	0B1, 1A1, 1C1, 2D1, 3D1, 4C1, 5C1, 6D1, and 7C1	Quarterly	Gamma Dose	Required
	One or two areas to serve as control stations; and	2F2, 4D1, 5F1	Quarterly	Gamma Dose	Required
	The balance of the stations to be placed in special interest areas such as population centers, nearby residences, or schools.	5F3, 7D1, 7D2, 7F1, and 7G2	Quarterly	Gamma Dose	Required
	A minimum of four stations around the ISFSI	IS1, IS2, IS3, IS4, IS5, IS6, IS7, IS8	Quarterly	Gamma Dose	Required
2. Airborne Radioiodine	Samples from $\geq$ 4 stations:				
	Three samples from close to the three SITE BOUNDARY locations (0S2, 8S1, & MT1) in different sectors.	0S2, 8S1, and MT1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required
	One sample from the vicinity of a community having the highest calculated annual average ground level D/Q.	7D1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required
	If food products are unavailable, additional air sampling will be done in the NNW (station 1S1) and SE (Station 8S2) sectors.	1S1 & 8S2	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required
	One sample from a control location.	5F1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
3. Airborne Particulate	Samples from ≥ 4 stations:				
	Three samples from close to the three SITE BOUNDARY locations (0S2, 8S1, & MT1) in different sectors.	0S2, 8S1, and MT1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx. 12 filters (by location).	Required
	One sample from the vicinity of a community having the highest calculated annual average ground level D/Q.	7D1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx. 12 filters (by location).	Required
	If food products are unavailable, additional air sampling will be done in the NNW (station 1S1) and SE (Station 8S2) sectors.	1S1 & 8S2	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx. 12 filters (by location).	Required
	One sample from a control location.	5F1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx. 12 filters (by location).	Required
4. Airborne Carbon-14					
	Samples from 3 stations: One sample from each of the NW and SE sectors close to the site (0S2 and 8S1). One sample used as a control station (5F1).	0S2,8S1 5F1 (control)	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	C-14 analysis	Supplemental

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
5. Waterborne					
a. Surface Ocean Water	One sample from the plant Outfall, Diablo Cove, and an area not influenced by plant discharge.	OUT, DCM, and 7C2	Monthly (grab sample)	Gamma isotopic[4] and tritium analysis.	Required
	One sample from the plant Outfall, Diablo Cove, and an area not influenced by plant discharge.	OUT, DCM, and 7C2	Quarterly (grab sample)	Gross Beta, Total Sr 89/90, Fe-55, and Ni-63	Supplemental
b. Drinking Water	One sample from the plant drinking water, one sample from Diablo Creek (upstream of plant), and one control sample.	DW1 and 5S2 OEL (control)	Monthly (grab sample)	Gamma isotopic[4], I-131, and tritium analysis.	Required
	One sample from the plant drinking water, one sample from Diablo Creek (upstream of plant), and one control sample.	DW1 and 5S2 OEL (control)	Quarterly (grab sample)	Gross Beta, Total Sr 89/90, Fe-55, and Ni-63	Supplemental
	One sample from Diablo Creek (downstream of plant) and one sample from Blanchard Spring.	WN2 and 1A2	Quarterly (grab sample)	Gamma isotopic[4], tritium, I-131, gross beta, Total Sr 89/90, Fe-55, and Ni-63	Supplemental
c. Groundwater	One sample from wells located under or downgradient from the plant power block.	OW1, OW2, DY1, GW1, and GW2	Quarterly (grab sample, when available)	Gamma isotopic[4], tritium, gross beta, Total Sr 89/90, Fe-55, and Ni-63	Supplemental
	One sample from a well located outside the plant power block (control sample).	WW2, 8S3	Quarterly (grab sample, when available)	Gamma isotopic[4], tritium, gross beta, Total Sr 89/90, Fe-55, and Ni-63	Supplemental
d. Sediment	One sample of offshore ocean sediment from Diablo Cove and Rattlesnake Canyon.	DCM and 7C2	Annual (grab sample)	Gamma isotopic[4]	Required
	One sample of offshore ocean sediment from Diablo Cove and Rattlesnake Canyon.	DCM and 7C2	Annual (grab sample)	Total Sr 89/90, Fe-55, and Ni-63	Supplemental
	One sample from each of five local recreational beaches.	AVA, MDO, PMO, CYA, and CBA	Semi- Annual (grab sample)	Gamma isotopic[4], Total Sr 89/90, Fe-55, and Ni-63	Supplemental
e. Marine Flora	One sample of kelp	DCM, PON, POS, and 7C2	Quarterly (when available)	Gamma isotopic[4]	Supplemental
	One sample of intertidal algae	DCM and 7C2	Quarterly (when available)	Gamma isotopic[4]	Supplemental

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
6. Ingestion					
a. Milk	Samples from milking animals in three locations within 5 km distance having the highest dose potential. If there are none, then one sample from milking animals in each of three areas between 5 to 8 km distance where doses are calculated to be greater than 1 mrem per year. One sample from milking animals at a control location 15 to 30 km distant and in the least prevalent wind direction. **NOTE:** The sample (5F2) should be taken monthly even if there are no indicator samples available.	5F2	Semimonthly when animals are on pasture; monthly at other times.	Gamma isotopic[4] and I-131 analysis.	Supplemental
b. Fish and Invertebrates	One sample of rock fish (family Sebastes) and one sample of perch (family Embiotocidae)	DCM and 7C2	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Required
	One sample of rock fish (family Sebastes) and one sample of perch (family Embiotocidae)	PON and POS	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental
	One sample of mussel (family Mytilus)	DCM and 7C2	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Required
	One sample of mussel (family Mytilus)	PON	Annual (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental
	One sample of mussel (family Mytilus)	POS	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental
	One sample of locally harvested market fish.	7D3 OR 2F1 (should alternate between locations)	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
c. Broadleaf Vegetation[5]	Three samples of broadleaf vegetation grown nearest off-site locations of highest calculated annual average ground level D/Q IF milk sampling is not performed.		Monthly (when available)	Gamma isotopic[4] analysis (that includes I-131) on edible portion.	Required (see notation #5)
	One sample of each of the similar broadleaf vegetation grown 15 to 30 km distant in the least prevalent wind direction IF milk sampling is not performed.		Monthly (when available)	Gamma isotopic[4] analysis (that includes I-131) on edible portion.	Required (see notation #5)
d. Vegetative Crops	One sample of broadleaf vegetation or vegetables or fruit	5F2, 7C1, and 7G1	Monthly (when available)	Gamma isotopic[4] analysis on edible portion.	Supplemental
	One sample of broadleaf vegetation or vegetables or fruit.	3C1, 6C1, 7E1	Quarterly (as provided by land owner)	Gamma isotopic[4] analysis on edible portion.	Supplemental
e. Meat sample	One sample of each species (cow, goat, sheep, deer, or pig) of edible meat portion slaughtered for personal consumption (not mass market).	BCM, BGM, BSM, JDM, JPM, ACM, ADM, APM, CCM	Quarterly (as available and provided by land owners within 8 km of plant site)	Gamma isotopic[4] analysis, and Total Sr 89/90 on edible portion.	Supplemental

Table Notations

1. Deviations are permitted from the required sampling schedule if specimens are unobtainable due to circumstances such as hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment and other legitimate reasons. If specimens are unobtainable due to sampling equipment malfunction, effort shall be made to complete corrective action prior to the end of the next sampling period. All deviations from the sampling schedule shall be documented in the Annual Radiological Environmental Operating Report. It is recognized that, at times, it may not be possible or practicable to continue to obtain samples of the media of choice at the most desired location or time. In these instances, suitable specific alternative media and locations may be chosen for the particular pathway in question and appropriate substitutions made within 30 days in the Radiological Environmental Monitoring Program, and submitted in the next Annual Radioactive Effluent Release Report, including a revised figure(s) and table for the ERMP reflecting the new location(s) with supporting information identifying the cause of the unavailability of samples for that pathway and justifying the section of the new location(s) for obtaining samples.

2. For the purposes of this table, a thermoluminescent dosimeter (TLD) is considered to be one phosphor. There are normally three calcium sulfate phosphors in an environmental TLD BADGE. Film badges shall not be used as dosimeters for measuring direct radiation.

3. Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than 10 times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

4. Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

5. If broadleaf vegetation food products are unavailable, additional air sampling as specified in Table 2.1, Parts 2 & 3 will be done in the NNW (station 1S1) and SE (Station 8S2) sectors.

6. The Branch Technical Position (Nov 79) states, "Any location from which milk can no longer be obtained may be dropped from the surveillance program after notifying the NRC in writing that they are no longer obtainable at that location". Although milk sampling performed at 5F2 is outside the 5-mile radius and is supplemental to the REMP, this notification should take place if 5F2 milk sampling ceases.

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TABLE 2.2

Distances and Directions to Environmental Monitoring Stations

Station Code[a]	Station Name	Radial Direction** (True Heading) Degrees	Radial Distance** From Plant	
			km	Miles
0S1	Exclusion Fence-Northwest Corner	320	0.16	0.1
0S2	North Gate	320	0.8	0.5
1S1	Wastewater Pond	330	0.64	0.4
2S1	Back Road-300 m North of Plant	0	0.32	0.2
3S1	Road NW of 230 kV Switchyard	23	0.64	0.4
4S1	Back Road Between Switchyards	43	0.8	0.5
5S1	500 kV Switchyard	58	0.64	0.4
5S2	Diablo Creek Weir	65	0.96	0.6
5S3	Microwave Tower Road	70	1.02	0.7
6S1	Microwave Tower	94	0.8	0.5
7S1	Overlook Road	112	0.48	0.3
8S1	Target Range	125	0.8	0.5
8S2	Southwest Site Boundary	128	1.76	1.1
8S3	DCSF 96-1 (monitor well)	145	0.52	0.33
9S1	South Cove	167	0.64	0.4
MT1	Meteorological Tower	185	0.32	0.2
DCM	Diablo Cove Marine	270	0.32	0.2
WN1	Northwest Guard Shack	290	0.32	0.2
WN2	Diablo Creek Outlet	283	0.25	0.15
1A1	Crowbar Canyon	327	2.56	1.6
1A2	Blanchard Spring	331	2.4	1.5
0B1	Point Buchon	325	5.76	3.6
1C1	Montana de Oro Campground	336	7.52	4.7
3C1	Ranch Vegetation	20	7.16	4.5
4C1	Clark Valley Gravel Pit	45	9.28	5.8
5C1	Junction Prefumo/See Canyon Roads	64	7.52	4.7
6C1	Household Garden	98	7.24	4.5
7C1	Pecho Creek Ruins (Mello Farm)	120	6.56	4.1
7C2	Rattlesnake Canyon	124	7.52	4.7
2D1	Sunnyside School	10	11.04	6.9
3D1	Clark Valley	24	9.92	6.2
4D1	Los Osos Valley Road	36	12.16	7.6
6D1	Junction See/Davis Canyon Roads	89	13.4	8.3
7D1	Avila Gate	118	10.56	6.6
7D2	Avila Beach	110	12.16	7.6
7D3	Avila Pier	120	11.0	6.9
7E1	Avila Valley Barn	103	13.94	8.7
2F1	Morro Bay (Commercial Landing)	0	17.44	10.9
2F2	Morro Bay Power Plant	358	17.9	11.2
5F1	SLO OEL	79	16.41	10.2
5F2	Cal Poly Farm	60	20.16	12.6
5F3	SLO County Health Department	70	20.32	12.7

Table 2.2 (continued)

Station Code[a]	Station Name	Radial Direction** (True Heading) Degrees	Radial Distance** From Plant km	Miles
7F1	Shell Beach	110	17.28	10.8
7G1	Arroyo Grande (Kawaoka Farm)	115	26.88	16.8
7G2	Oceano Substation	118	27.68	17.3
AVA	Avila Beach (near pier)	109	11.75	7.3
CBA	Cambria Moonstone Beach	330	45.86	28.5
CYA	Cayucos Beach (near pier)	350	26.87	16.7
DY1	Drywell 115'	77	0.041	0.026
DW1	Drinking Water (Plant Potable Water Sys)	161	0.59	0.37
GW1	Groundwater Monitoring Well 1	271	0.15	0.09
GW2	Groundwater Monitoring Well 2	204	0.21	0.13
IS1-IS8	ISFSI	65	0.48	0.3
MDO	Montana de Oro (Spooners Cove)	336	7.56	4.7
OW1	Observation Well 01	336	0.07	0.046
OW2	Observation Well 02	157	0.07	0.045
OEL	Offsite Emergency Lab	79	16.41	10.2
OUT	Plant Outfall	270	0.32	0.2
PMO	Pismo Beach (near pier)	113	20.76	12.9
PON	Pacific Ocean North of Diablo Cove	305	2.4	1.5
POS	Pacific Ocean South of Diablo Cove	180	0.64	0.4
WW2	Water Well 02	70	1.02	0.63
BCM	Blanchard (Farm) Cow Meat	320	1.94	1.2
BGM	Blanchard (Farm) Goat Meat	320	1.94	1.2
BSM	Blanchard (Farm) Sheep Meat	320	1.94	1.2
CCM	Control Cow Meat	328	59.5	37
JDM	Johe (Property) Deer Meat	21	5.24	3.26

*The reference point used is the dome of Unit 1 containment.

*Station Code (XYZ):

X - First number (0-9) represents the radial sector in which the station is located:

0	- Northwest	5	- East-northeast
1	- North-northwest	6	- East
2	- North	7	- East-southeast
3	- North-northeast	8	- Southeast
4	- Northeast	9	- South-southeast

Y - Letter (S, A-H) represents the distance from the plant:

S	- On-site
A	- 0-2 miles from plant (but off-site)
B	- 2-4 miles from plant
C	- 4-6 miles from plant
D	- 6-8 miles from plant
E	- 8-10 miles from plant
F	- 10-15 miles from plant
G	- 15-20 miles from plant
H	- Greater than 20 miles from plant

Z - Second number represents the station number within the zone.

Table 2.2 (continued)

*Station Codes exceptions:

The following stations do not follow the coding system:

- Diablo Cove Marine (DCM)
- Meteorological Tower (MT1)
- Northwest guard shack (WN1)
- Diablo Creek outlet (WN2)
- Pacific Ocean North (PON)
- Pacific Ocean South (POS)
- Offsite Emergency Lab (OEL)
- Plant outfall (OUT)
- Drinking water (DW1)
- Water Well 02 (WW2)
- Observation Well 01 (OW1)
- Observation Well 02 (OW2)
- Drywell 115 (DY1)
- Avila Beach (AVA)
- Groundwater Monitoring Well 1 (GW1)
- Groundwater Monitoring Well 2 (GW2)
- Montana de Oro (MDO)
- Pismo Beach (PMO)
- Cayucos Beach (CYA)
- Cambria Moonstone Beach (CBA)
- Blanchard Cow Meat (BCM)
- Blanchard Goat Meat (BGM)
- Blanchard Sheep Meat (BSM)
- Control Cow Meat (CCM)
- Johe Deer Meat (JDM)
- Johe Pig Meat (JPM)
- Andre Cow Meat (ACM)
- Andre Deer Meat (ADM)
- Andre Pig Meat (APM)
- ISFSI TLDs (IS1 – IS8)

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TABLE 2.3:

Detection Capabilities for Environmental Sample Analysis [a]

Lower Limits of Detection (LLD) [b]

Analysis	Water (pCi/L)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/L)	Food Products (pCi/kg, wet)	Soil/Sediment (pCi/kg, dry)[e]
Gross beta	4	0.01				
H-3	400[c]					
Mn-54	15		130			150
Fe-59	30		260			300
Co-58	15		130			150
Co-60	15		130			150
Zn-65	30		260			300
Zr-95	30					300
Nb-95	15					150
I-131	1[d]	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-140	60			60		600
La-140	15			15		150

Table Notations

a) The gamma emitters and corresponding LLD values listed are derived from standard ODCM guidance for environmental samples as found in Table 4.12-1 in NUREG-1301. This list does not mean that only these nuclides are to be considered. Other peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Annual Radiological Environmental Operating Report.

b) The LLD is defined, for purposes of these specifications, as the a-priori 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.

c) If no drinking water pathway exists, a value of 3,000 pCi/L may be used for tritium. All groundwater wells should use the 400 pCi/L tritium value regardless of drinking water use.

d) The LLD value of 1 pCi/L for I-131 is applicable only to sources used as drinking water. If no drinking water pathway exists, a value of 15 pCi/L may be used for I-131.

e) The gamma emitters LLD values listed for soil/sediment are derived from the Cs-134/137 10:1 ratio established in the environmental LLDs in NUREG-1301, Table 4.12-1.

TABLE 2.3 (Continued)

Table Notations

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66 s_b}{E \times V \times 2.22 \times Y \times \exp(-\lambda t)}$$

Where:

- LLD = the "a priori" the lower limit of detection as defined above (as pCi per unit mass or volume)
- S_b = the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)
- E = the counting efficiency (as counts per transformation)
- V = the sample size (in units of mass or volume)
- 2.22 = the number of transformations per minute per pico-curie
- Y = the fractional radiochemical yield (when applicable)
- λ = the radioactive decay constant for the particular radionuclide
- t = the elapsed time between sample collection (or end of the sample collection period) and time of counting

The value of S_b used in the calculation of the LLD for a detection system will be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background will include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples).

Analyses will be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors will be identified and described in the Annual Environmental Radiological Operating Report.

Typical values of E, V, Y and t should be used in the calculation. It should be recognized that the LLD is defined as a-priori (before the fact) limit representing the capability of a measurement system and not as a-posteriori (after the fact) limit for a particular measurement.

TABLE 2.4: Reporting Levels for Radioactivity Concentrations in Environmental Samples

Analysis	Water (pCi/L)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/L)	Food Products (pCi/kg, wet)
H-3	* 20,000				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-Nb-95	400				
I-131	** 2	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	

* For drinking water samples. This is the 40 CFR 141 value. If no drinking water pathway exists, a value of 30,000 pCi/L may be used.

** If no drinking water pathway exists, a value of 20 pCi/L may be used

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Figure 2.1- Diablo Canyon Off-site Stations

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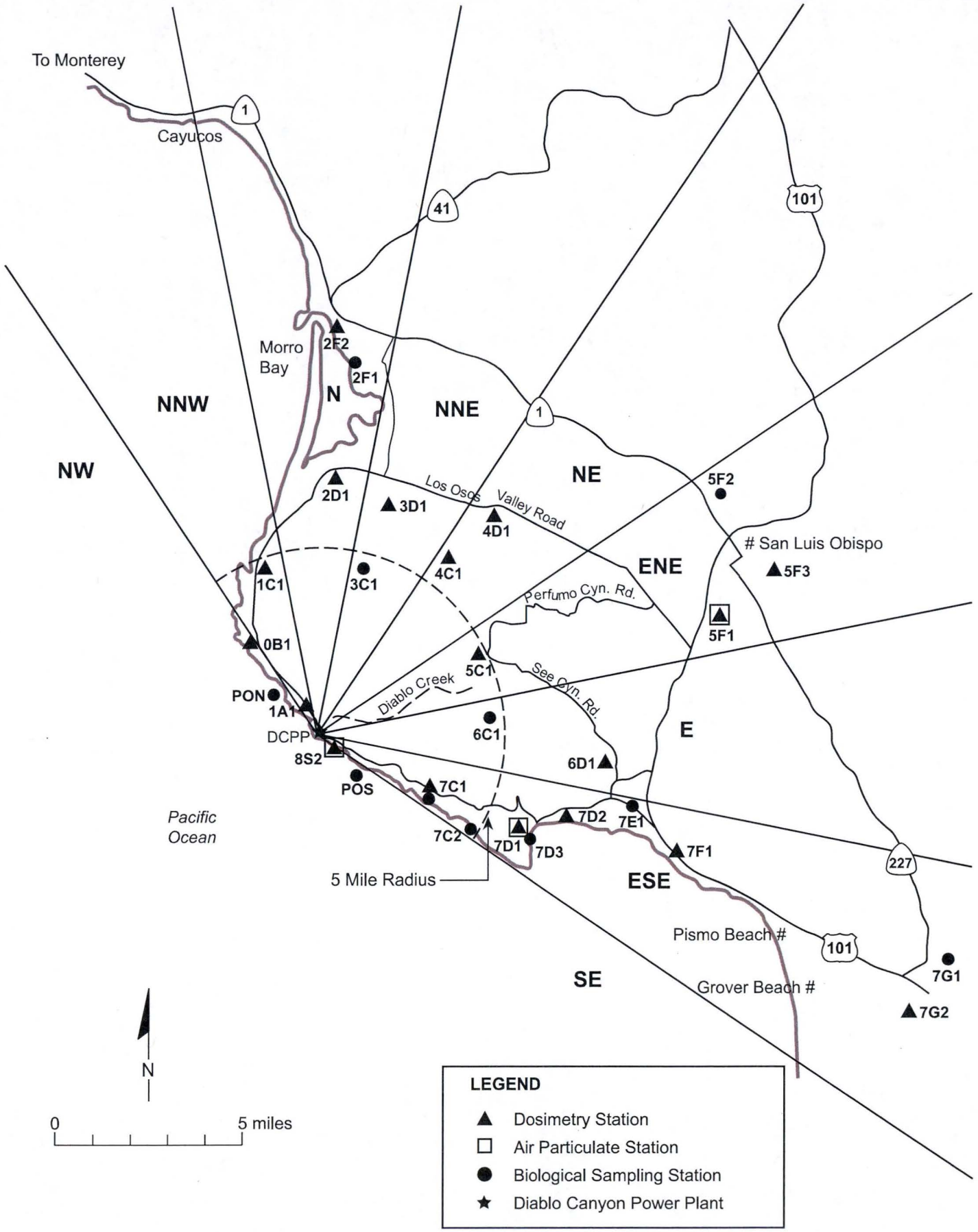

Units 1 and 2 Diablo Canyon off-site stations.

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Figure 2.2- Diablo Canyon On-site Stations

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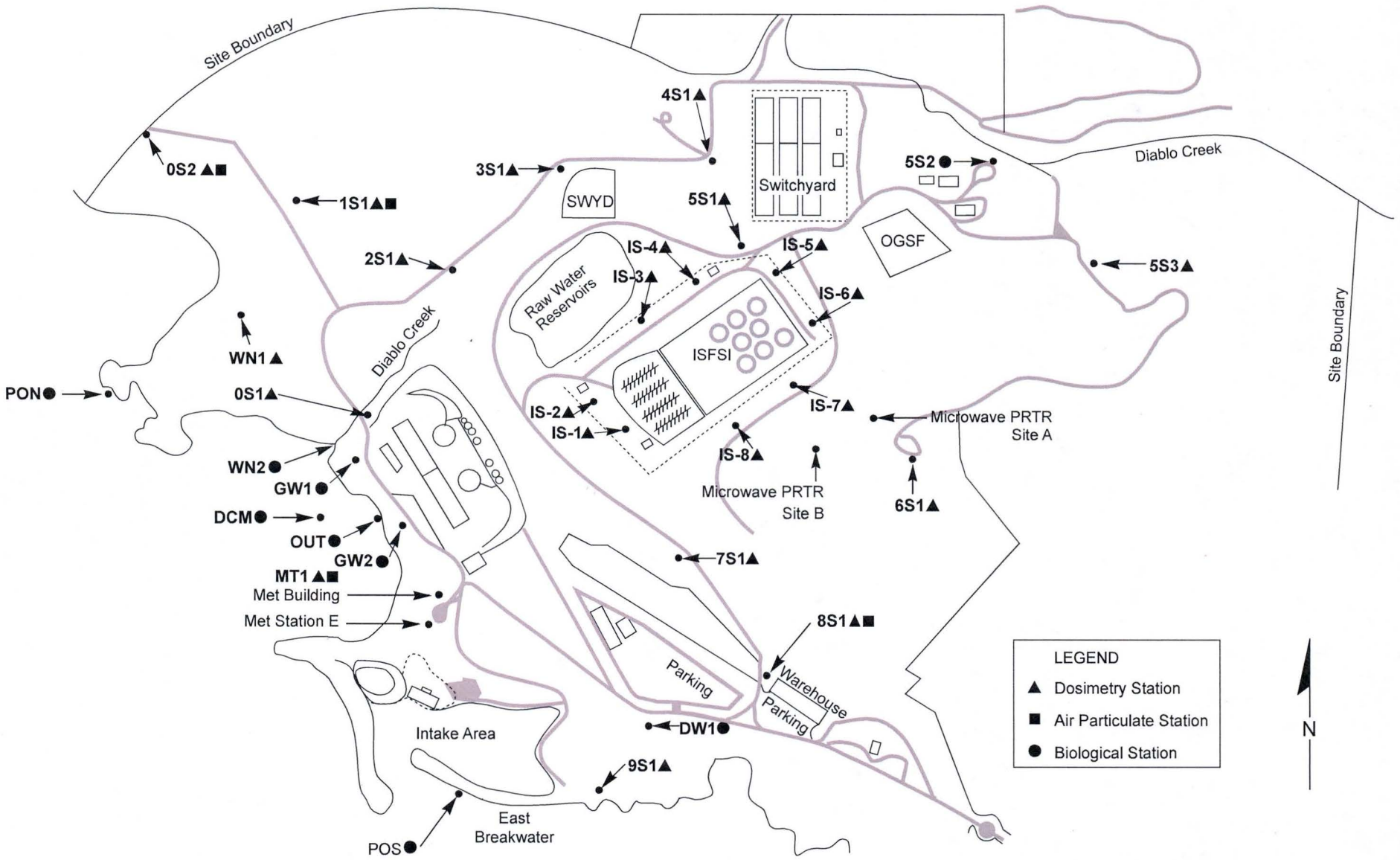

DCPP Onsite ERMP Stations

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Figure 2.3- Diablo Canyon Station Locations

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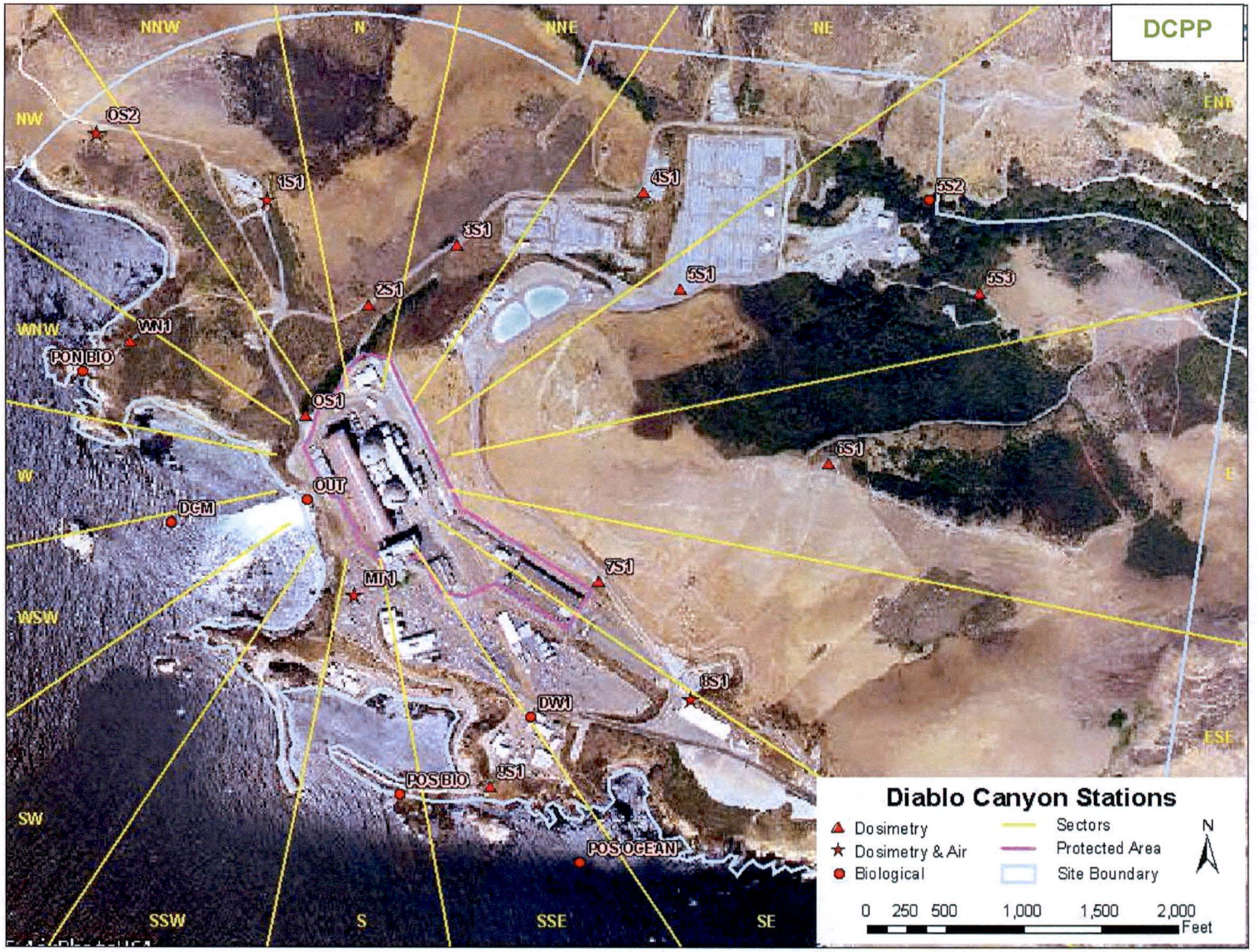
DCPP
NNW
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ENE
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OS2
1S1
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5S2
3S1
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5S3
2S1
WNW
WNI
PON BIO
OS1
6S1
W
E
OUT
DCM
7S1
MTI
WSW
8S1
DWI
ESE
POS BIO
9S1
SW
POS OCEAN
SSW
S
SSE
SE
Diablo Canyon Stations
Dosimetry
Dosimetry & Air
Biological
Sectors
Protected Area
Site Boundary
N
0 250 500 1,000 1,500 2,000
Feet

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3.0 RADIOLOGICAL DATA-SUMMARY OF TABLES

This section summarized the analytical results of the environmental samples collected during the monitoring period. The results were presented in a format similar to that prescribed in the NRC's Radiological Assessment Branch Technical Position on Environmental Monitoring, Revision 1, November 1979 (NUREG-1301).

Each table was nuclide specific and the total numbers of analyses for that radionuclide were provided. Additionally, the number of measurements which exceeded the Reporting Levels (NRC Notification Level) found in Table 2.4 of this report were provided. The first column listed the matrix or pathway sampled during the period. The second column listed the nuclides analyzed and number of samples performed. The third column provided the required a-priori Lower Limit of Detection (LLD) for radionuclides that have detection capability requirements as specified in Table 2.3 of this report. The fourth, fifth, and sixth columns contained the mean and range of results for locations. The seventh column contained the number of reportable occurrences for the location pathway. Occasionally, the required LLD may not be met. An example of this

occurrence might be due to hold times between sampling and analysis. Such cases, if any, were addressed in Section 4.2 of this report.

The a-posteriori Minimum Detectable Concentration (MDC) listed for each analysis in Appendix C was used as the detection evaluation point for each sample collected. The MDC was calculated by the laboratory with each analysis (a-posteriori) and incorporated conditions observed at the laboratory during the analysis. This MDC value mathematically represents the lowest concentration of activity that could be detected by the laboratory with a 95% confidence level. The MDC was also understood as the concentration where there was only a 5% probability of falsely reporting a positive detection in a true blank sample. Note that the a-posteriori MDC equation used by the environmental lab was the same as the a-priori Lower Limit of Detection (LLD) equation specified in NUREG-1301.

For this report, a sample was considered to yield a "detectable measurement" when the "result" concentration exceeded the associated a-posteriori MDC value for that analysis.

Additionally, the tables provided the mean of all sample results analyzed for the specified radionuclide/ media type, the range, and the number of samples that were considered to have detectable activity of all the samples counted:

- The mean value consisted of the average of detectable concentrations
- The lowest and highest detected concentration values were listed as the range
- The number of detectable measurements and the total number of measurements were listed. For example, (4/20) would indicate that 4 of the 20 samples collected (for that sample type and that radionuclide) contained detectable radioactivity (> MDC).

The radionuclides reported in this section represented those that:

- had an LLD requirement in Table 2.3, or a Reporting Level listed in Table 2.4
- were of specific interest for any other reason

The radionuclides routinely analyzed and reported within a gamma spectroscopy analysis were: Ac-228, Ag-108m, Ag-110m, Ba-140, Be-7, Bi-212, Bi-214, Ce-141, Ce-144, Co-57, Co-58, Co-60, Cr-51, Cs-134, Cs-137, Fe-59, I-131, K-40, La-140, Mn-54, Nb-95, Pb-210, Pb-212, Pb-214, Ra-224, Ra-226, Ru-103, Ru-106, Sb-124, Sb-125, Th-234, Tl-208, Zn-65, and Zr-95.

Table 3.1
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant

Location of Facility: San Luis Obispo, CA
(County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B]	Indicator with Highest Annual Mean Name, Distance, and Direction Range[B]	All Indicator Locations Mean[B]	All Indicator Locations Range[B]	All Control Locations Mean[B]	All Control Locations Range[B]	Number of Reportable Occurrences
Direct Radiation (mR/std quarter)			5S1, 0.4 mi, 58°		See Table 2.2		2F2, 4D1, 5F1		
	Env TLD Badges[C] (384	5 mR/qtr	21.8	20.0 - 24.0 (12/12)	16.0	7.2 - 24.0 (348/348)	13.8	10.0 - 17.9 (36/36)	0
			IS4, 0.3 mi, 65°		IS1 - IS8				
	ISFSI TLDs[D] (96)	5 mR/qtr	102.2	90.8 - 113.7 (12/12)	44.1	22.0 - 113.7 (96/96)			0

Table Notation:

(A) Sensitivity of TLD system

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

(C) 96 TLD badges are distributed quarterly at 32 locations (29 indicator stations and 3 control stations). Each quarter there are 3 badges per station.

(D) 24 ISFSI TLD badges are distributed quarterly at 8 locations surrounding the ISFSI protected area within the site boundary. Each quarter there are 3 badges per station.

Table 3.2
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B]	Indicator with Highest Annual Mean Name, Distance, and Direction Range[B]	All Indicator Locations Mean[B]	All Indicator Locations Range[B]	All Control Locations Mean[B]	All Control Locations Range[B]	Number of Reportable Occurrences
Airborne (pCi/meter^3)	Iodine (364)		7D1, 6.6 mi, 118°		0S2, 1S1, 7D1, 8S1, 8S2, MT1		5F1, 10.2 mi, 79°		
	I-131	0.07		None Detected (0 / 52)		None Detected (0 / 312)	1.14E-2	1.14E-2 (1 / 52)	0
Airborne (pCi/meter^3)	Air Particulates (364)		7D1, 6.6 mi, 118°		0S2, 1S1, 7D1, 8S1, 8S2, MT1		5F1, 10.2 mi, 79°		
	Gross Beta	0.01	3.19E-2	8.21E-3 to 9.55E-2 (52/52)	2.85E-2	3.74E-3 to 9.55E-2 (311/312)	4.10E-2	4.72E-3 to 9.78E-2 (51/52)	0
	Gamma Isotopic[C] (28)		7D1, 6.6 mi, 118°		0S2, 1S1, 7D1, 8S1, 8S2, MT1		5F1, 10.2 mi, 79°		
	Cs-134	0.05		None Detected (0 / 4)		None Detected (0 / 24)		None Detected (0 / 4)	0
	Cs-137	0.06		None Detected (0 / 4)		None Detected (0 / 24)		None Detected (0 / 4)	0
Airborne (uCi/meter^3)	Air Carbon-14 (156)		8S1, 0.5 mi, 125°		0S2, 8S1		5F1, 10.2 mi, 79°		
	Carbon-14	1.00E-06		None Detected (0 / 52)		None Detected (0 / 104)		None Detected (0 / 52)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

(C) These gamma isotopic samples are quarterly composite samples of all weekly particulate air sample filters. Approximately 13 particulate filters for each REMP location. Plant related radionuclides, not naturally occurring isotopes.

Table 3.3

Environmental Radiological Monitoring Program Summary

Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant

Location of Facility: San Luis Obispo, CA (County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Surface Water (pCi/Liter)	Gamma Isotopic (36)		DCM, 0.2 mi, 270°	DCM, OUT	7C2, 4.7 mi, 124°	
	Mn-54	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Fe-59	30	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Co-58	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Co-60	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Zn-65	30	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Zr-95	30	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Nb-95	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	I-131	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Cs-134	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Cs-137	18	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Ba-140	60	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	La 140	15	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Additional Analysis					
	Gross Beta (36)	4	375 215-575 (12/12)	345 215-575 (24/24)	322 130-517 (9/12)	0
	Fe-55 (36)		none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Ni-63 (36)		none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Tritium H-3 (36)	400	none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0
	Total Sr 89/90 (36)		none detected (0 / 12)	none detected (0 / 24)	none detected (0 / 12)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.4
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Drinking Water (pCi/Liter)	Gamma Isotopic (45)		5S2, 0.6 mi, 65°	DW1, 5S2, WN2, 1A2	OEL, 10.2 mi, 79°	
	Mn-54	15	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Fe-59	30	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Co-58	15	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Co-60	15	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Zn-65	30	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Zr-95	30	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Nb-95	15	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	I-131	1	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Cs-134	15	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Cs-137	18	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Ba-140	60	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	La 140	15	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Additional Analysis					
	Gross Beta (45)	4	7.34 2.64 - 13.7 (4/12)	6.06 2.64 - 13.7 (8/33)	5.3 1.99 - 8.62 (2/12)	0
	Fe-55 (45)		none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Ni-63 (45)		none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Tritium H-3 (45)	400	none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0
	Total Sr 89/90 (45)		none detected (0 / 12)	none detected (0 / 33)	none detected (0 / 12)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.5
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA
(County, State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Mussels (pCi/kg)	Gamma Isotopic (13)		DCM, 0.2 mi, 270°	DCM, PON, POS	7C2, 4.7 mi, 124°	
	Mn-54		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Fe-59		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Co-58		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Co-60		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Zn-65		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Zr-95		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Nb-95		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	I-131	60	none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Cs-134	60	none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Cs-137	80	none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	Ba-140		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0
	La-140		none detected (0 / 4)	none detected (0 / 9)	none detected (0 / 4)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.6
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County, State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Fish (pCi/kg)	Gamma Isotopic (37)		POS, 0.4 mi, 180°	DCM, PON, POS, 2F1, 7D3	7C2, 4.7 mi, 124°	
	Mn-54	130	none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Fe-59	260	none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Co-58	130	none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Co-60	130	none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Zn-65	260	none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Zr-95		none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Nb-95		none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	I-131		none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Cs-134	130	none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	Cs-137	150	6.36 6.36 (1/8)	6.36 6.36 (1/29)	4.78 4.78 (1/8)	0
	Ba-140		none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0
	La-140		none detected (0 / 8)	none detected (0 / 29)	none detected (0 / 8)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.7
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County, State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Algae* (pCi/kg)	Gamma Isotopic (4)		DCM, 0.2 miles, 270°	DCM, 0.2 miles, 270°	7C2, 4.7 miles, 124°	
	Mn-54		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Fe-59		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Co-58		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Co-60		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Zn-65		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Zr-95		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Nb-95		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	I-131	60	DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Cs-134	60	DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Cs-137	80	DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	Ba-140		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0
	La-140		DCM algae unavailable in 2015	DCM algae unavailable in 2015	none detected (0 / 4)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

* These samples are supplemental samples.

Table 3.8
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant

Location of Facility: San Luis Obispo, CA
(County, State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Kelp* (pCi/kg)	Gamma Isotopic (16)		DCM, 0.2 mi, 270°	DCM, PON, POS	7C2, 4.7 mi, 124°	
	Mn-54		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Fe-59		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Co-58		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Co-60		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Zn-65		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Zr-95		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Nb-95		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	I-131	60	none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Cs-134	60	none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Cs-137	80	none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	Ba-140		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0
	La-140		none detected (0 / 4)	none detected (0 / 12)	none detected (0 / 4)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

* These samples are supplemental samples.

Table 3.9
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Vegetative Crops (pCi/kg)			6C1, 4.5 mi, 98°	3C1, 5F2, 6C1, 7C1, 7E1	7G1, 16.8 mi, 115°	
	Gamma Isotopic (55)					
	Mn-54		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Fe-59		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Co-58		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Co-60		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Zn-65		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Zr-95		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Nb-95		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	I-131	60	None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Cs-134	60	None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	Cs-137	80	31.0 (1 / 4)	31.0 (1 / 42)	None Detected (0 / 13)	0
	Ba-140		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0
	La-140		None Detected (0 / 4)	None Detected (0 / 42)	None Detected (0 / 13)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.10
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA
(County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Milk (pCi/Liter)					5F2, 12.6 mi, 60°	
	Iodine extraction (12)					
	I-131	1	Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Gamma Isotopic (12)					
	Mn-54		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Fe-59		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Co-58		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Co-60		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Zn-65		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Zr-95		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Nb-95		Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Cs-134	15	Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Cs-137	18	Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Ba-140	60	Not Applicable	Not Applicable	None Detected (0 / 12)	0
	La-140	15	Not Applicable	Not Applicable	None Detected (0 / 12)	0
	Total Sr 89/90 (12)		Not Applicable	Not Applicable	None Detected (0 / 12)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.11
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA
(County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Meat (pCi/kg)			BCM, 1.5 mi, 331°	BCM, 1.5 mi, 331°	CCM, 37 mi, 328°	
	Gamma Isotopic (8)					
	Mn-54		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Fe-59		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Co-58		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Co-60		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Zn-65		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Zr-95		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Nb-95		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	I-131	60	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Cs-134	60	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Cs-137	80	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Ba-140		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	La-140		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Total Sr 89/90 (8)		none detected (0/4)	none detected (0 / 4)	none detected (0 / 4)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis, e.g. (10/12) means 10 samples out of 12 collected showed activity.

Table 3.12
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA
(County, State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	Indicator Locations Mean[B] Range[B]	Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Ocean Sediment (pCi/kg dry)			DCM, 0.2 mi, 270°	DCM, 0.2 mi, 270°	7C2, 4.7 mi, 124°	
	Gamma Isotopic (4)					
	Mn-54	150	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Fe-59	300	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Co-58	150	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Co-60	150	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Zn-65	300	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Zr-95	300	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Nb-95	150	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	I-131		none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Cs-134	150	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Cs-137	180	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Ba-140	600	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	La-140	150	none detected (0 / 2)	none detected (0 / 2)	none detected (0 / 2)	0
	Fe-55 (2)		none detected (0 / 1)	none detected (0 / 1)	none detected (0 / 1)	0
	Ni-63 (2)		none detected (0 / 1)	none detected (0 / 1)	none detected (0 / 1)	0
	Total Sr 89/90 (2)		none detected (0 / 1)	none detected (0 / 1)	none detected (0 / 1)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.13
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA
(County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Beach Sand (pCi/kg dry)			AVA, 7.3 mi, 109°	AVA, MDO, PMO, CYA	CBA, 28.5 mi, 330°	
	Gamma Isotopic (10)					
	Mn-54	150	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Fe-59	300	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Co-58	150	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Co-60	150	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Zn-65	300	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Zr-95	300	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Nb-95	150	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	I-131		none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Cs-134	150	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Cs-137	180	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Ba-140	600	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	La-140	150	none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Fe-55 (10)		none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Ni-63 (10)		none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0
	Total Sr 89/90 (10)		none detected (0 / 2)	none detected (0 / 8)	none detected (0 / 2)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.14
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B] Range[B]	All Indicator Locations Mean[B] Range[B]	All Control Locations Mean[B] Range[B]	Number of Reportable Occurrences
Groundwater (pCi/Liter)			8S3, 0.3 mi, 145°	8S3, 0.3 mi, 145°	WW2, 0.6 mi, 70°	
	Gamma Isotopic (8)					
	Mn-54	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Fe-59	30	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Co-58	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Co-60	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Zn-65	30	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Zr-95	30	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Nb-95	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	I-131	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Cs-134	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Cs-137	18	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Ba-140	60	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	La-140	15	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Gross Beta (8)	4	7.79 1.75-21.2 (4/4)	7.79 1.75-21.2 (4/4)	11.8 4.16-39.7 (2/4)	0
	Fe-55 (8)		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Ni-63 (8)		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Total Sr 89/90 (8)		none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0
	Tritium H-3 (8)	400	none detected (0 / 4)	none detected (0 / 4)	none detected (0 / 4)	0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Table 3.15
Environmental Radiological Monitoring Program Summary
Report Period: 1/1/15 - 12/31/15

Name of Facility: Diablo Canyon Power Plant Location of Facility: San Luis Obispo, CA (County , State)

Medium or Pathway Sampled (Unit of Measure)	Type and Total Number of Analyses Performed	Lower Limit of Detection[A] (LLD)	Indicator with Highest Annual Mean Name, Distance, and Direction Mean[B]	Range[B]	All Indicator Locations Mean[B]	Range[B]	All Control Locations Mean[B]	Range[B]	Number of Reportable Occurrences
Monitoring Wells (pCi/Liter)			DY1, 0.03 mi, 77°		DY1, GW1, GW2, OW1, OW2		WW2, 0.6 mi, 70°		
	Gamma Isotopic (18)								
	Mn-54	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Fe-59	30	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Co-58	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Co-60	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Zn-65	30	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Zr-95	30	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Nb-95	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	I-131	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Cs-134	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Cs-137	18	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Ba-140	60	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	La-140	15	none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Gross Beta (18)	4	23.4	21.3 to 25.5 (2/2)	19.6	6.0 to 44.5 (12/14)	11.8	4.16 to 39.7 (2/4)	0
	Fe-55 (18)		none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Ni-63 (18)		none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Total Sr 89/90 (18)		none detected (0 / 2)		none detected (0 / 14)		none detected (0 / 4)		0
	Tritium H-3 (19)	400	7,280	4580 to 11,600 (3/3)	2,790	252 to 11,600 (10/15)	none detected (0 / 4)		0

Table Notation:

(A) Unless specified, all required LLDs were met in accordance with Table 2.3

(B) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis e.g. , (10/12) means 10 samples out of 12 collected showed activity.

Note : Monitoring well tritium concentrations due to rain washout of an approved airborne discharge pathway from plant vents.

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4.0 ANALYSIS OF ENVIRONMENTAL RESULTS

4.1 REMP SAMPLING VARIANCE / DEVIATIONS

The DCPP Radiological Environmental Monitoring Program (REMP) allowed for deviations in the REMP sampling schedule "if samples were unobtainable due to hazardous conditions, seasonal unavailability, or malfunction of sampling equipment." Such deviations did not compromise the program's effectiveness and were normally anticipated for any radiological environmental monitoring program.

The DCPP REMP included both required and supplemental samples. This section described the variances/deviations with sampling and described some of the supplemental sampling conducted during the year.

4.1.1 DIRECT RADIATION

The ISFSI projects team loaded an additional 8 spent fuel dry casks onto the DCPP ISFSI pad from May 1st to July 3rd, 2015.

4.1.2 AIRBORNE RADIOACTIVITY

The 2015 mean percent availability for on-site and off-site particulate and iodine (P&I) air samplers was 99.5 percent. In other words, all P&I air samplers were up and running 99.5 percent of the time. Less than 0.4 percent of run time could be attributed to equipment problems, filter exchange, or calibration processes. Specific 2015 air sampling run time deviations were as follows:

- 2 hours of lost run time occurred at station MT1 on 3/4/15 due to site maintenance
- 6.25 hours of lost run time occurred at stations 1S1 and 8S2 on 3/14/15 due to site maintenance
- 60.3 hours of lost run time occurred at station 8S2 during the week of 3/4/15 due to air sample pump failure
- 149.8 hours of lost run time occurred at station 5F1 during the week of 4/8/15 due to air sample pump failure

Actual 2015 percent availabilities for each station were as follows:

0S2 = 99.9 %
1S1 = 99.8 %
5F1 = 98.2 %
7D1 = 100 %
8S1 = 99.7 %
8S2 = 99.1 %
MT1 = 99.9 %

Airborne C-14 supplemental sampling was performed weekly at stations 8S1 (SE Sector), 0S2 (NW Sector), and 5F1 (control station in San Luis Obispo) in 2015.
General Engineering Labs (GEL) and DCPP REMP worked together to develop a method for sampling inorganic environmental airborne C-14 (as CO_2). It should be noted that C-14 lab data was reported in units of uCi/m^3 (not pCi/m^3) within Appendix A.
GEL has monitored C-14 samples from various locations around the US. In some instances a very slight negative bias has been observed in annual data sets. The bias was not enough to mask any true positive detection of C-14. GEL believes this bias may be the result of the sorbent picking up other chemical species in the field during the week long collection. These chemical species (possibly SO_2 or NO_2) could cause some quenching effects in the liquid scintillation analysis and

varies by site location. This chemical interference created a net effect where some field cartridges were slightly lower in activity than laboratory blanks. The bias was less than the average two sigma method uncertainty and significantly less than the method average detection limit.

4.1.3 MARINE SAMPLES

DCM supplemental quarterly intertidal algae samples were unavailable during 2015.

All remaining 2015 marine samples were collected as scheduled (including allowable variation).

The California Department of Fish and Game issued regulations prohibiting the collection of abalone along the central and southern coast of California. PG&E considers it unlikely that future collection of abalone will be allowed within the DCPP environs. The REMP has therefore ceased routine abalone sampling. Note that the sampling of abalone was previously performed and was supplemental to the REMP.

4.1.4 TERRESTRIAL SAMPLES

All 2015 terrestrial samples were collected as scheduled (including allowable variation) with the following exceptions:

- Supplemental Blanchard Sheep Meat (BSM) and Blanchard Goat Meat (BGM) were not available and were not provided by the rancher during all of 2015. Blanchard sheep and goats were not within 5 miles of the DCPP site in 2015. The changes in Blanchard ranch operations were due to the ongoing severe drought conditions along the central coast of California.

4.1.5 OCEAN SURFACE WATER, DRINKING WATER, AND GROUNDWATER

All 2015 water samples were collected as scheduled (including allowable variation) with the following exceptions:

- Observation Well 02 (OW2) was dry during all four quarters of 2015. No OW2 monitoring well water samples were obtained in 2015.
- Drywell 115 (DY1) was dry during the fourth quarter of 2015.

4.1.6 REPLICATE SAMPLES

Replicate sampling was conducted within the REMP for program strength and quality. A replicate sample is an additional sample (same matrix type and station) taken independently from the original scheduled REMP sample. The replicate sample collection is performed by a different person and shipped to GEL to ensure independent analysis result correlation and method consistency.

Replicate samples were taken from:

- 7C2 – Ocean Sediment (2/5/15)
- DCM - Ocean Sediment (2/19/15)
- 5F2 - Vegetation (6/23/15)
- 7G1 - Vegetation (9/17/15)

The results of the replicate analyses were within expected correlation of routine sampling.

4.2 COMPARISON OF ACHIEVED LLDS WITH REQUIREMENTS

For each analysis having an LLD requirement, criteria and process procedures were in place to achieve the calculated "*a-priori*" (before the fact) LLD. Meeting these process criteria satisfies the "a-priori" LLD requirements. The "*a-posteriori*" (after the fact) Minimum Detectable Concentration (MDC) for that analysis was also compared with the required "*a-priori*" (before the fact) LLD.

Table 2.3 of this report list the required "a-priori" Lower Limits of Detection (LLDs) for environmental sample analyses required by the DCPP Radiological Environmental Monitoring Program. Occasionally an LLD may have been unachievable due to sampling process situations, such as hold times between sampling and analysis.

Air sampling a-priori LLDs were not met for REMP P&I samples from 2/25/15 through 3/4/15 due to shipping weather (snow) delays.

All remaining analyzed REMP samples met the specified "a-priori" LLD requirements in 2015.

4.3 COMPARISON OF RESULTS AGAINST REMP REPORTING LEVELS

NRC notification was required whenever a Reporting Level listed in Table 2.4 of this document was exceeded. Reporting Levels were the environmental concentrations that relate to the ALARA design dose objectives of 10 CFR 50, Appendix I.

It should be noted that environmental isotopic concentrations were averaged over the calendar quarter for the purposes of this comparison, and that Reporting Levels applied only to DCPP plant related effluent radioactivity.

No REMP Reporting Levels were exceeded during this 2015 monitoring period.

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4.4 DATA ANALYSIS BY MEDIA TYPE

The REMP data for each media type is discussed below. A sample was considered to yield a "detectable measurement" when the resultant concentration exceeded the MDC for that analysis.

4.4.1 Direct Radiation (Environmental TLDs)

Direct radiation was continuously measured at 32 locations surrounding DCPP using Panasonic UD-814 thermo-luminescent dosimeters (TLDs). These 32 locations were made up of 29 indicator stations & 3 control stations. These station TLD dosimeters were distributed and collected every calendar quarter for processing. Methodology from ANSI/HPS N13.37-2014 "Environmental Dosimetry - Criteria for System Design and Implementation" was used to evaluate and report the Env TLD data. Historical background baseline values for each station were established from 1987 to 2008 Env TLD data.

DCPP environmental TLD results were measurements of all environmental gamma radiation sources (cosmic, terrestrial, radon, and man-made) at each station during the deployment period. Transient and lab storage background dose contributions were subtracted prior to reporting. Technically, these TLDs read out in units of milliroentgen. Because gamma radiation has a

quality factor of approximately 1 for conversion from milliroentgen to millirem, the environmental TLD unit of reporting was converted to millirem (mr) for consistency of unit reporting and ease of exposure communications.

An evaluation of direct radiation measurements and member of public occupancy times within the site boundary indicated all federal criteria for member of public dose limits (10CFR20.1301) were conservatively met. An evaluation of direct radiation measurements indicated all federal EPA 40CFR190 criteria were conservatively met. Comparing data from the 2015 DCPP Annual Radiological Effluent Release Report (ARERR), dose to a member of the public resulting from gaseous effluent releases at DCPP was an extremely small fraction of measured Env TLD dose. Therefore, it was concluded that gaseous effluents from DCPP had negligible impact on measured Env TLD values.

The following chart reports the 2015 quarterly Env TLD individual station results. These individual station results were compared to a Historical Quarterly Baseline value that was calculated using individual station data from 1987 to 2008.

Chart column reporting methodology was as follows:

- **ND** = not detected
- **Quarterly Investigation Level Dose** = Standard Quarter TLD result - Historical Quarterly Baseline; If ≤ 5, report "ND". If > 5, report value (mrem).
- **Historical Annual Baseline** = Historical Quarterly Baseline X 4
- **Annual TLD Result** = Qtr 1 + Qtr 2 + Qtr 3 + Qtr 4 Standard Quarter TLD Results
- **Annual Investigation Level Dose** = Annual TLD Result - Historical Annual Baseline; If ≤ 10, report "ND". If > 10, report value (mrem).

If "Investigation Level Dose" was detected, an evaluation of DCPP contribution was conducted and explained within this report.

2015 Quarterly REMP Env TLD Analysis

2015 Annual REMP Env TLD Analysis

DCPP Station ID	Distance in miles	Historical Quarterly Baseline (mrem)	2015 Standard Quarter TLD Results (mrem)				2015 Quarterly Investigation Level Dose (mrem)				Historical Annual Baseline (mrem)	2015 Annual TLD Result (mrem)	2015 Annual Investigation Level Dose (mrem)
			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4			
MT1	0.2	20.9	22.1	20.3	16.7	18.6	ND	ND	ND	ND	83.6	77.7	ND
WN1	0.2	12.7	13.9	12.0	8.5	11.0	ND	ND	ND	ND	50.8	45.4	ND
0S1	0.1	20.3	21.8	20.3	16.6	18.4	ND	ND	ND	ND	81.2	77.1	ND
5S1	0.4	23.0	24.0	22.2	20.8	20.0	ND	ND	ND	ND	92.0	87.0	ND
6S1	0.5	14.0	14.6	13.3	12.8	12.4	ND	ND	ND	ND	56.0	53.1	ND
8S1	0.5	16.3	18.0	16.5	16.3	15.4	ND	ND	ND	ND	65.2	66.2	ND
8S2	1.1	20.4	21.8	19.8	19.1	18.9	ND	ND	ND	ND	81.6	79.6	ND
5S3	0.7	18.6	19.3	17.8	18.2	17.1	ND	ND	ND	ND	74.4	72.4	ND
2F2	11.2	13.8	15.0	14.6	13.0	12.4	ND	ND	ND	ND	55.2	55.0	ND
2D1	6.9	12.2	14.4	13.2	12.2	10.9	ND	ND	ND	ND	48.8	50.7	ND
4D1	7.6	12.3	13.2	10.4	10.0	10.4	ND	ND	ND	ND	49.2	44.0	ND
5F1	10.2	17.7	17.9	17.0	15.7	15.4	ND	ND	ND	ND	70.8	66.0	ND
1A1	1.6	12.1	13.0	12.5	10.8	10.5	ND	ND	ND	ND	48.4	46.8	ND
7D2	7.6	16.7	17.7	16.1	15.1	14.9	ND	ND	ND	ND	66.8	63.8	ND
7G2	17.3	17.3	19.8	19.1	17.9	17.1	ND	ND	ND	ND	69.2	73.9	ND
7C1	4.1	18.0	18.6	17.3	16.6	15.5	ND	ND	ND	ND	72.0	68.0	ND
7F1	10.8	16.7	17.9	16.6	16.6	15.8	ND	ND	ND	ND	66.8	66.9	ND
0B1	3.6	10.3	11.8	9.8	7.2	9.3	ND	ND	ND	ND	41.2	38.1	ND
7D1	6.6	11.9	12.4	10.7	10.7	9.9	ND	ND	ND	ND	47.6	43.7	ND
4C1	5.8	11.0	11.8	10.1	9.9	9.4	ND	ND	ND	ND	44.0	41.2	ND
0S2	0.5	17.1	18.0	17.0	13.9	15.3	ND	ND	ND	ND	68.4	64.2	ND
1S1	0.4	16.8	18.7	18.0	16.3	15.6	ND	ND	ND	ND	67.2	68.6	ND
2S1	0.2	16.9	17.5	17.2	16.0	14.7	ND	ND	ND	ND	67.6	65.4	ND
3S1	0.4	20.4	21.6	20.0	19.4	18.7	ND	ND	ND	ND	81.6	79.7	ND
4S1	0.5	18.9	20.4	18.7	17.5	17.1	ND	ND	ND	ND	75.6	73.7	ND
7S1	0.3	18.3	21.1	20.0	19.0	17.5	ND	ND	ND	ND	73.2	77.6	ND
9S1	0.4	21.7	23.6	22.3	21.1	20.2	ND	ND	ND	ND	86.8	87.2	ND
1C1	4.7	13.4	14.6	14.1	12.1	11.8	ND	ND	ND	ND	53.6	52.6	ND
5C1	4.7	16.6	16.4	15.1	16.2	14.5	ND	ND	ND	ND	66.4	62.2	ND
3D1	6.2	12.9	14.0	13.8	12.5	11.3	ND	ND	ND	ND	51.6	51.6	ND
6D1	8.3	15.5	15.3	13.7	13.2	12.9	ND	ND	ND	ND	62.0	55.1	ND
5F3	12.7	19.8	17.5	16.3	16.0	14.7	ND	ND	ND	ND	79.2	64.5	ND

ND = not detected

The 2015 AREOR historical background has been determined using Env TLD results from 1987 to 2008 (before ISFSI operation). DCPP became operational in 1986.

Quarterly Investigation Level Dose = Standard Quarter TLD result - Historical Quarterly Baseline. If ≤ 5, report "ND". If > 5, report value (mrem).

Historical Annual Baseline = Historical Quarterly Baseline X 4

Annual TLD Result = Qtr 1 + Qtr 2 + Qtr 3 + Qtr 4 TLD Results

Annual Investigation Level Dose = Annual TLD Result - Historical Annual Baseline. If ≤ 10, report "ND". If > 10, report value (mrem).

See DCPP Station ID Maps in Figure 2.1 and Figure 2.2

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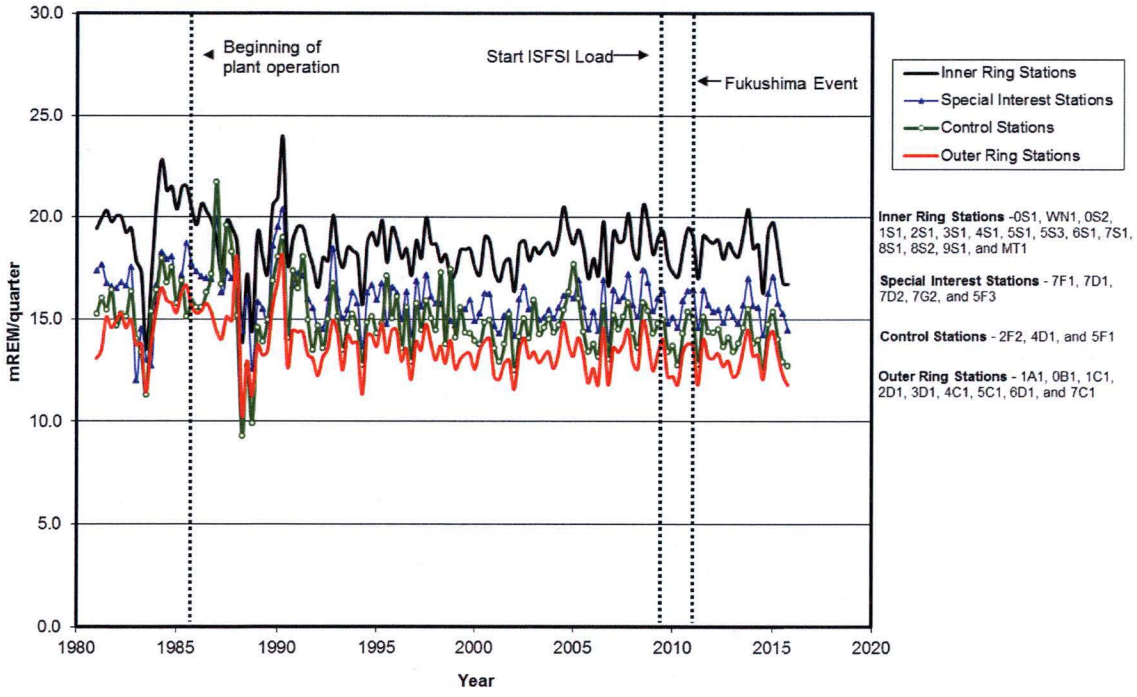
The following graph illustrated overall trending of Env TLDs with regard to distance from the DCPP plant site.

Inner ring, outer ring, special interest, and control stations were combined and averaged to obtain a single standard quarter value for each represented plot line.

Inner and outer ring TLD averages remained within and trended with pre-operational Env TLD ranges. DCPP operations did not affect Env TLD results.

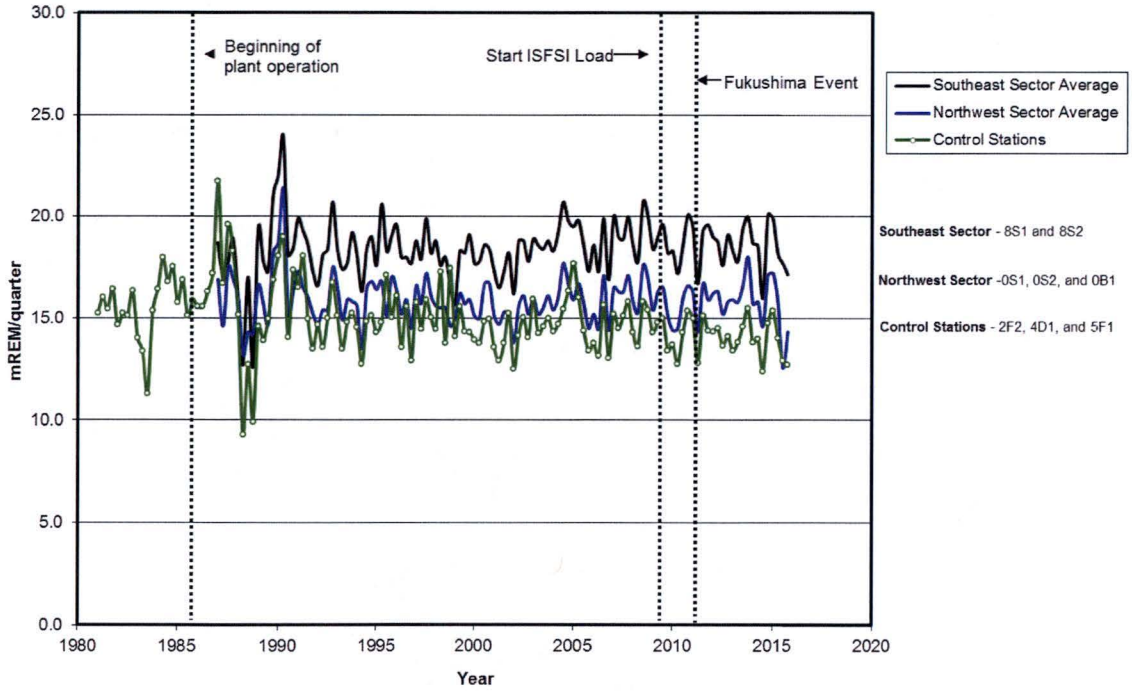


The following graph illustrated averaged Env TLD results from the southeast sector (stations 8S1, 8S2) and northwest sector (stations 0S1, 0S2, 0B1).

These sectors were chosen for graphical trending due to their historically high averaged wind directions and would therefore indicate the most gaseous effluent impact on environmental TLD results.

The southeast and northwest sectors Env TLD averages trended with pre-operational Env TLD ranges. DCPP operations did not affect Env TLD results within these sectors.

Averaged control stations (2F2, 4D1, 5F1) were provided for reference.



Direct Radiation (ISFSI Env TLDs)

DCPP was licensed with an exclusion area boundary (i.e. site boundary) as an approximate 880 yard radius from U-1 Containment center. No permanent public access was permitted within the exclusion area. The unrestricted area (outside the site boundary) surrounding DCPP was sparsely inhabited out to five miles from the site (ref 2015 Land Use Census within Section 8).

The direct radiation levels within a very small area surrounding the onsite ISFSI were elevated due to dry cask spent fuel storage. ISFSI pad TLD stations IS-1 through IS-8 were located adjacent to the ISFSI pad fencing (see map in Figure 2.2 of this report). The remaining onsite areas were not affected due to the ISFSI topographical elevation and placement within an onsite hillside which provided radiation shielding to the rest of the site.

- The first spent fuel dry cask canister was loaded onto the ISFSI pad in June 2009. The small increase in radiation levels at the ISFSI pad prior to the first spent fuel canister load was due to storage of Radioactive Material (RAM) equipment in seatrains at the ISFSI pad prior to an outage. These seatrains of RAM were removed prior to the first load of spent fuel dry cask canisters.
- Dry cask loading Campaign # 2 occurred in May 2010.
- Dry cask loading Campaign # 3 occurred during the first quarter of 2012 and ended on 3/17/2012.
- Dry cask loading Campaign # 4 occurred from August to October of 2013.
- Dry cask loading Campaign #5 occurred from 5/1/15 to 7/3/15 with the addition of 8 dry casks onto the onsite ISFSI.

The following chart reports the 2015 quarterly ISFSI Env TLD individual station results. These individual ISFSI station results were compared to the 1987 to 2008 Historical Quarterly Baseline value at station 5S1. Station 5S1 was used for historical baseline purposes due to 5S1 close proximity to the ISFSI pad and 5S1 pre-ISFSI historical data.

Chart column reporting methodology was as follows:

- **ND** = not detected
- **Quarterly Investigation Level Dose** = Standard Quarter TLD result - Historical Quarterly Baseline; If ≤ 5, report "ND". If > 5, report value (mrem).
- **Historical Annual Baseline** = Historical Quarterly Baseline X 4
- **Annual TLD Result** = Qtr 1 + Qtr 2 + Qtr 3 + Qtr 4 Standard Quarter TLD Results
- **Annual Investigation Level Dose** = Annual TLD Result - Historical Annual Baseline; If ≤ 10, report "ND". If > 10, report value (mrem).

"Investigation Level Dose" was detected at ISFSI Env TLD stations IS-3 through IS-7 due to DCPP spent fuel dry casks stored on the ISFSI pad.

An evaluation of direct radiation measurements outside the site boundary indicated all federal EPA 40CFR190 criteria for public dose limits were conservatively met.

An evaluation of direct radiation measurements and member of public occupancy times within the site boundary indicated all federal criteria for member of public dose limits (10CFR20.1301) were conservatively met.

The following pages also contain a picture of the ISFSI pad and a trend graph of onsite ISFSI pad averaged TLD results (IS-1 through IS-8).

2015 Quarterly ISFSI Env TLD Analysis

2015 Annual ISFSI Env TLD Analysis

DCPP Station ID	Distance in miles	Historical Quarterly Baseline (mrem)	2015 Standard Quarter TLD Results (mrem)				2015 Quarterly Investigation Level Dose (mrem)				Historical Annual Baseline (mrem)	2015 Annual TLD Result (mrem)	2015 Annual Investigation Level Dose (mrem)
			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4			
IS-1	0.3	23.0	23.6	22.6	23.3	24.1	ND	ND	ND	ND	92.0	93.6	ND
IS-2	0.3	23.0	23.9	24.2	25.5	24.4	ND	ND	ND	ND	92.0	98.0	ND
IS-3	0.3	23.0	33.1	36.9	49.6	48.6	10.1	13.9	26.6	25.6	92.0	168.2	76.2
IS-4	0.3	23.0	90.8	92.6	111.5	113.7	67.8	69.6	88.5	90.7	92.0	408.6	316.6
IS-5	0.3	23.0	53.3	52.1	51.8	50.3	30.3	29.1	28.8	27.3	92.0	207.5	115.5
IS-6	0.3	23.0	49.6	48.8	48.4	43.5	26.6	25.8	25.4	20.5	92.0	190.3	98.3
IS-7	0.3	23.0	37.0	35.6	41.5	40.4	14.0	12.6	18.5	17.4	92.0	154.5	62.5
IS-8	0.3	23.0	22.8	23.3	23.6	22.0	ND	ND	ND	ND	92.0	91.7	ND

ND = not detected
Historical Baseline from REMP Station 5S1 was used due to proximity to ISFSI and 5S1 historical pre-ISFSI monitoring time frame from 1987 to 2008
Quarterly Investigation Level Dose = Standard Quarter TLD result - Historical Quarterly Baseline. If $\leq$ 5, report "ND". If > 5, report value (mrem).
Historical Annual Baseline = Historical Quarterly Baseline X 4
Annual TLD Result = Qtr 1 + Qtr 2 + Qtr 3 + Qtr 4 TLD Results
Annual Investigation Level Dose = Annual TLD Result - Historical Annual Baseline. If $\leq$ 10, report "ND". If > 10, report value (mrem).

See DCPP Station ID Map in Figure 2.2

The Investigation Level quarterly and annual doses were due to spent fuel dry casks stored on the ISFSI pad.

The DCPP ISFSI Pad is located conservatively within the DCPP site boundary (unrestricted area).
The DCPP ISFSI Pad is topographically elevated above most of the site and is built into a hillside. These characteristics shield the rest of the site from ISFSI related radiation.
No permanent public access is permitted within the DCPP site boundary (within the unrestricted area).
Access occupancy surrounding the ISFSI is isolated and controlled by DCPP Security.
10CFR20.1301 member of public exposure and 40CFR190 unrestricted area exposure were evaluated. Dose limits were not exceeded and were conservatively met.

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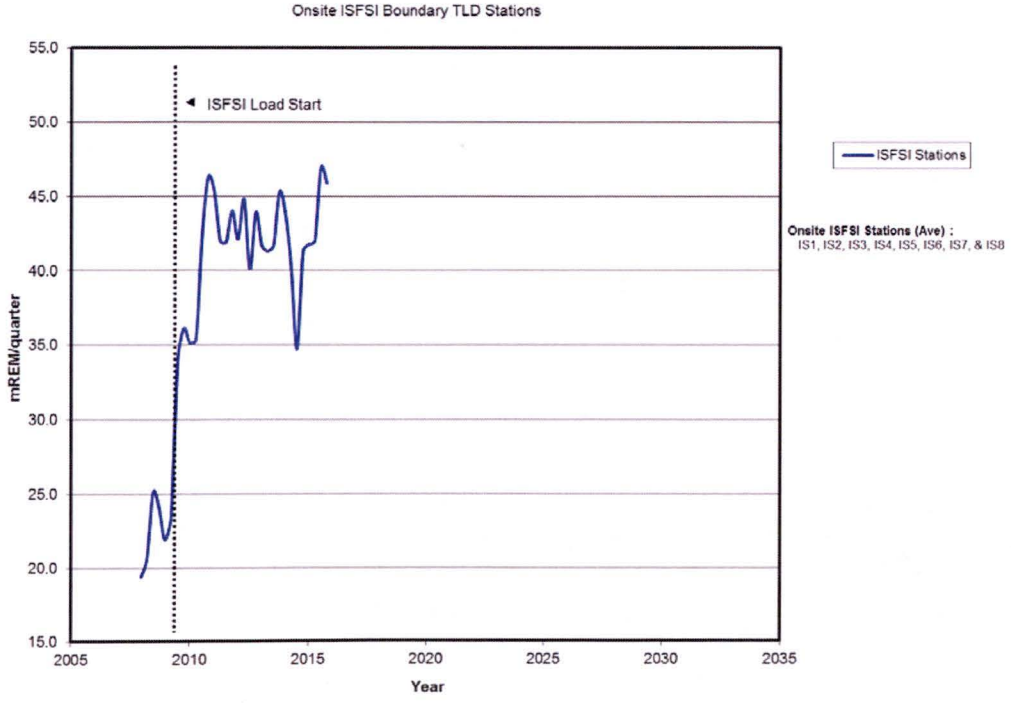
03/05/2015


Onsite ISFSI Boundary TLD Stations
ISFSI Load Start
ISFSI Stations
Onsite ISFSI Stations (Ave) :
IS1, IS2, IS3, IS4, IS5, IS6, IS7, & IS8
mREM/quarter
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
2005
2010
2015
2020
2025
2030
2035
Year

4.4.2 Airborne

Air particulate and radioiodine samples were collected weekly from six indicator stations (MT1, 0S2, 1S1, 7D1, 8S1, and 8S2) in the DCPP environs and at one control station (5F1). A total of 364 air particulate filters and 364 iodine cartridges were collected and analyzed as part of the normal REMP.

Natural occurring gross beta activity was detected in every weekly air particulate sample collected from all indicator and control stations. Comparison of the data showed that the mean values of gross beta activities for the indicator stations were consistent with those obtained for the control station and historical trending. Normal background gross beta values ranged from 3.7E-3 to 9.5E-2 pCi/m^3.

Gamma isotopic analyses were performed on quarterly composites of the air particulate filters from each of the REMP air stations. The midpoint date of the quarter was used to label the composite.

A total of 364 REMP weekly charcoal cartridges were analyzed for I-131. I-131 was detected one time at station 5F1 during the week of December 9-16, 2015. This is the control station located in San Luis Obispo (SLO). No other air stations closer to the site detected I-131 during this time period. One possible explanation for I-131 at this location was it's proximity to the SLO sewage treatment facility (about 0.9 miles). Medical isotopes from the sewage treatment facility or from a person treated with I-131 (thyroid ablation) in close proximity to the air sampler were the most likely sources of I-131 detection at this location. This I-131 detection in SLO was not due to DCPP operations.

Appendix A contains individual air sampling station data results.

4.4.3 Drinking Water and Ocean Surface Water

Drinking Water

Drinking water samples were collected from indicator stations DW1, 5S2, WN2, 1A2, and control station OEL. The samples were analyzed for gamma emitters, gross beta, tritium, total strontium 89/90, Iron-55, and Nickle-63. No plant related radionuclides were detected in any of the 2015 drinking water samples.

The results of the drinking water samples collected from both the indicator and control stations were individually listed in Appendix A.

Ocean Surface Water

Ocean surface water samples were collected monthly from indicator stations OUT, DCM, and control station 7C2. The samples were analyzed for gamma emitters, gross beta, tritium, total strontium 89/90, Iron-55, and Nickle-63. No DCPP related radionuclides were detected in any of the 2015 ocean surface water samples.

The results of the surface water samples collected from both the indicator and control stations were individually listed in Appendix A.

4.4.4 Ingestion

Marine Biological Samples

Mussels were collected quarterly from stations DCM, 7C2, and POS. Mussels were collected annually from station PON (due to small mussel bed/availability at station PON).

Fish samples were collected quarterly from stations DCM, PON, POS, 7C2 (control), and a local fish market (7D3 or 2F1). Market fish samples were locally caught fish.

Cs-137 was detected in fish at the following stations, dates, and concentrations:

- 7C2 Rockfish 2/5/15 4.78 pCi/kg
- POS Perch 5/22/15 6.36 pCi/kg

Pre-operational (pre-1985) DCPP REMP sampling observed measurable Cs-137 in fish and sediment due to atmospheric nuclear weapons testing fallout from the 1960's and 1970's. Finding Cs-137 in fish or sediment has been historically common in SLO County and the DCPP environs

due to atomic weapons testing fallout. The historical fish Cs-137 concentrations have ranged from 3 to 14 pCi/kg. These 2015 concentrations of Cs-137 detected in fish were within this range.

This Cs-137 activity was also in agreement with the 1981 California Dept of Health Services Radiological Health Branch report and was considered part of SLO County background radioactivity. The preoperational 1981 ranges of Cs-137 observed in the Diablo cove (DCM) fish were 0 to 26 pCi/kg (decay corrected 0 to 12 pCi/kg in 2015). The 1981 ranges of Cs-137 observed in market fish were 0 to 38 pCi/kg (decay corrected 0 to 17 pCi/kg in 2015). The 1981 ranges of Cs-137 observed in ocean sediment were 0 to 93 pCi/kg (decay corrected 0 to 42 pCi/kg in 2015). The 1981 ranges of Cs-137 observed in soil were 0 to 298 pCi/kg (decay corrected 0 to 135 pCi/kg in 2015).

Another recent background source of Cs-137 into California environs was due to the March 2011 Fukushima Event and subsequent jet stream isotopic dispersion to the United States.

Because Cs-137 has an isotopic half-life of approximately 30 years, this contaminant should be detected in the DCPP environs for the next 10 to 40 years depending on initial concentration and the detection sensitivity of the REMP analyses. Cs-137 has a longer environmental half-life in coastal seawaters than in open oceans due to input sources like rain watershed runoff and storm condition sediment re-suspension.

No Cs-134 was found in these fish samples. Cs-134 has a shorter isotopic half-life (approximately 2 years), would be indicative of nuclear reactor fission products, and would not be attributed to atomic weapons testing. Because Cs-134 was absent in the REMP fish analyses; fish Cs-137 concentrations were attributed to either pre-1980's nuclear weapons testing or Fukushima related fallout.

All other marine fish and mussel samples did not detect any DCPP related radionuclides in 2015.

The results of the marine biological samples collected from both the indicator and control stations were individually listed in Appendix A.

Marine Aquatic Vegetation

Supplemental marine aquatic kelp sampling was performed quarterly at REMP sample indicator stations DCM, PON, POS, and 7C2 (control). Supplemental intertidal algae sampling was performed quarterly at REMP sample station 7C2.

Each sample was analyzed for gamma emitting radionuclides. No DCPP related isotopes were detected in 2015.

The results of the marine aquatic vegetation samples collected from both the indicator and control stations were individually listed in Appendix A.

Ocean Sediment and Recreational Beach Sampling

Ocean sediment samples were collected annually from stations DCM and 7C2. Supplemental recreational beach sand samples were collected semi-annually from stations Avila Beach (AVA), Montana de Oro Spooner's Cove (MDO), Pismo Beach near pier (PMO), Cayucos Morro Strand State Beach (CYA), and Cambria Moonstone Beach (CBA). Each sample was analyzed for gamma emitting radionuclides, total strontium 89/90, Iron-55, and Nickle-63.

Only natural occurring isotopes where detected in the ocean sediment and recreational beach sand samples collected for 2015. The results were individually listed in Appendix A.

4.4.5 Vegetation (Food Crops)

Samples of broad leaf vegetation were collected monthly (when available) from two indicator stations (7C1 and 7G1), and one control location (5F2). Supplemental samples were also collected quarterly from residence or commercial gardens at stations 3C1, 6C1, and 7E1. The samples were analyzed for gamma emitting radionuclides and for Iodine-131 on edible portions.

No DCPP related isotopes were detected in 2015 vegetation.

The results of the vegetation samples collected from both the indicator and control stations were individually listed in Appendix A.

4.4.6 Milk

There are no milking animals (for human consumption) within 5 miles of the plant site. In substitution, the DCPP REMP required additional air sampling at stations 8S2 and 1S1.

Supplemental samples of milk were collected monthly from Cal Poly Farm (station 5F2) due to Cal Poly dairy being the closest milk producer relative to the DCPP site and regardless of the availability of milk stations within 5 miles of the plant.

The milk samples were analyzed for gamma emitting radionuclides, Iodine-131, and total strontium 89/90. No DCPP related radionuclides were detected in station 5F2 milk samples during 2015.

The results of the milk samples were individually listed in Appendix A.

4.4.7 Meat Products

Meat products were collected quarterly when available or provided from landowners.

Blanchard cattle were allowed to graze on the northern lands around DCPP during 2015. Blanchard Cow Meat (BCM) was sampled quarterly for gamma emitting radionuclides and total strontium 89/90.

Supplemental Blanchard Sheep Meat (BSM) and Blanchard Goat Meat (BGM) were not available and were not provided by the rancher during all of 2015. Blanchard sheep and goats were not within 5 miles of the DCPP site in 2015. The changes in Blanchard ranch operations were due to the ongoing severe drought conditions along the central coast of California.

Control station free range, grass fed beef sampling was conducted of ranches outside the influence of DCPP. This meat was purchased by REMP personnel from the Whole Foods Market in SLO. The control station meat consisted of Hearst Ranch beef which is located approximately 37 miles north of the DCPP site. This REMP station code was CCM (Control Cow Meat).

No DCPP related isotopes were detected in 2015 meats.

The results of the meat samples were individually listed in Appendix A.

5.0 GROUND WATER MONITORING

Diablo Canyon is committed to improving management of situations involving inadvertent radiological releases that get into onsite groundwater. This commitment reflects the nuclear industry's high standard of public radiation safety and protection of the environment. Trust and confidence on the part of local communities, California State, the NRC, and the general public is paramount to this commitment.

Groundwater gradient studies of the DCPP ISFSI site and a general assessment of sub-regional hydro-geologic conditions indicates that groundwater (subsurface) flow beneath the Diablo Canyon power block is west to northwest toward the Pacific Ocean. Any groundwater present beneath the DCPP power block was not used as a source of drinking water.

5.1 NEI 07-07 GROUNDWATER PROTECTION INITIATIVE - REPORTING

5.1.1 NEI 07-07 Objective 2.4 (b), Annual Reporting:

"Document in the AREOR all on-site ground water sample results that are included in the REMP as described in the DCPP Offsite Dose Calculation Manual (ODCM)".

Onsite groundwater monitoring points are described in the REMP and reported in this 2015 Annual Radiological Environmental Operating Report (AREOR) as follows:

Observation Well 01 (OW1), Observation Well 02 (OW2), Drywell 115 (DY1), DCSF96-1 (8S3), Water Well 02 (WW2), Groundwater Well 1 (GW1), Groundwater Well 2 (GW2), and Diablo Creek Outlet (WN2) were used for Groundwater Protection Initiative (GPI) data reporting and were described in 2015 DCPP AREOR Table 2.1.

5.2 GROUNDWATER SAMPLING OVERVIEW:

As part of the nuclear industry NEI 07-07 Groundwater Protection Initiative (GPI), DCPP began sampling various ground water sources in 2006. These sources included onsite monitoring wells (OW1, OW2, DY1, & 8S3), an aquifer well (WW2), Diablo Canyon creek (5S2 & WN2), and a groundwater spring (1A2). Two additional groundwater monitoring wells (stations GW1 and GW2) were installed along the western side of the DCPP site on December 14, 2011. REMP began sampling these two new wells during the first quarter of 2012.

One groundwater aquifer well (WW2) was available within the plant site boundary. This well was located about 250 feet above and to the east of the power block. WW2 was sampled quarterly for gamma emitters, gross beta, tritium, total strontium 89/90, Iron-55, and Nickle-63. No plant related radionuclides were detected in 2015.

One shallow (approximately 70 feet deep) subsurface monitoring well (8S3) was located southeast at approximately 0.3 miles from the power block. 8S3 was sampled quarterly for gamma emitters, gross beta, tritium, total strontium 89/90, Iron-55, and Nickle-63. No plant related radionuclides were detected in 2015.

Three shallow (approximately 37 to 73 feet deep) French drain system monitoring wells were located within the plant protected area and in close proximity to the containment structures, spent fuel pools, and radiologically controlled area auxiliary building. These French drain systems were labeled Observation Well 01 (OW1), Observation Well 02 (OW2), and Drywell 115 (DY1).

OW2 was not sampled in 2015 due to no water present in the well during the entire 2015 timeframe. There has been an ongoing severe drought in San Luis Obispo County which contributed to this dry well.

French drain monitoring wells OW1 and DY1 contained low levels of tritium throughout 2015 due to rainwater washout of gaseous tritium exiting the plant vent system (via an approved effluents discharge path). These tritium concentrations were evaluated and were not due to a plant system leak or spill. This tritium was evaluated and attributed to the rain-washout of gaseous tritium exiting the plant vent system via an approved effluent discharge path. DCPP conducted rain-washout studies to document this phenomenon. These monitoring wells consisted of French drain systems that discharge into the associated monitoring well (OW1, OW2, or DY1). Rain communicated with these French drain systems via building structure to ground interfaces. Once rain water entered the monitoring wells, the water remained stagnant until another rain event caused transport. Subsequent quarterly sampling routinely indicated consistent tritium values due to monitoring well stagnation.

OW1 was connected to subsurface groundwater flow fissures and routinely trends with rain fall. DY1 routinely experienced the highest rain-washout tritium concentrations due to its close proximity to the plant-vent gaseous discharge points.

The specific ranges of tritium detected in these power block monitoring wells for 2015 were as follows:

- OW1 - Observation Well 01 (1,130 to 1,590 pCi/L) 4 of 4 samples collected for tritium analysis.
- OW2 - Observation Well 02 ; no samples collected (well dry)
- DY1 - Drywell 115 (4,580 to 11,600 pCi/L) 3 of 4 samples collected for tritium analysis.

No other DCPP related isotopes were detected in OW1, OW2, or DY1.

As mentioned previously, two down-gradient monitoring wells were added to the REMP in 2012.

Groundwater Well 1 (GW1) was located between the DCPP protected area and the cliff boundary of the Pacific Ocean. This well opening was located at approximately 85' above sea level on the same plane as the power block and was approximately 85' deep.

Groundwater Well 2 (GW2) was located between the DCPP protected area and the cliff boundary

of the Pacific Ocean. This well opening was located at approximately 85' above sea level on the same plane as the power block and was approximately 85' deep.

The specific ranges of tritium detected in GW1 monitoring well for 2015 were as follows:

- GW1 - Groundwater Well 1 (252 to 306 pCi/L) 3 of 4 samples collected for tritium analysis.

This tritium was evaluated and attributed to the rain-washout of gaseous tritium exiting the plant vent system via an approved effluent discharge path.

No other DCPP related isotopes were detected in GW1 or GW2 in 2015.

All other samples of groundwater at 5S2, 1A2, and WN2 did not indicate the presence of tritium or any other DCPP related isotopes (only NORM isotopes were observed) in 2015.

The results of groundwater sampling were individually listed in Appendix A.

Rain washout of tritium is discussed within NRC Regulatory Issue Summary (RIS) 2008-003, "Return/Re-use of Previously Discharged Radioactive Effluents".

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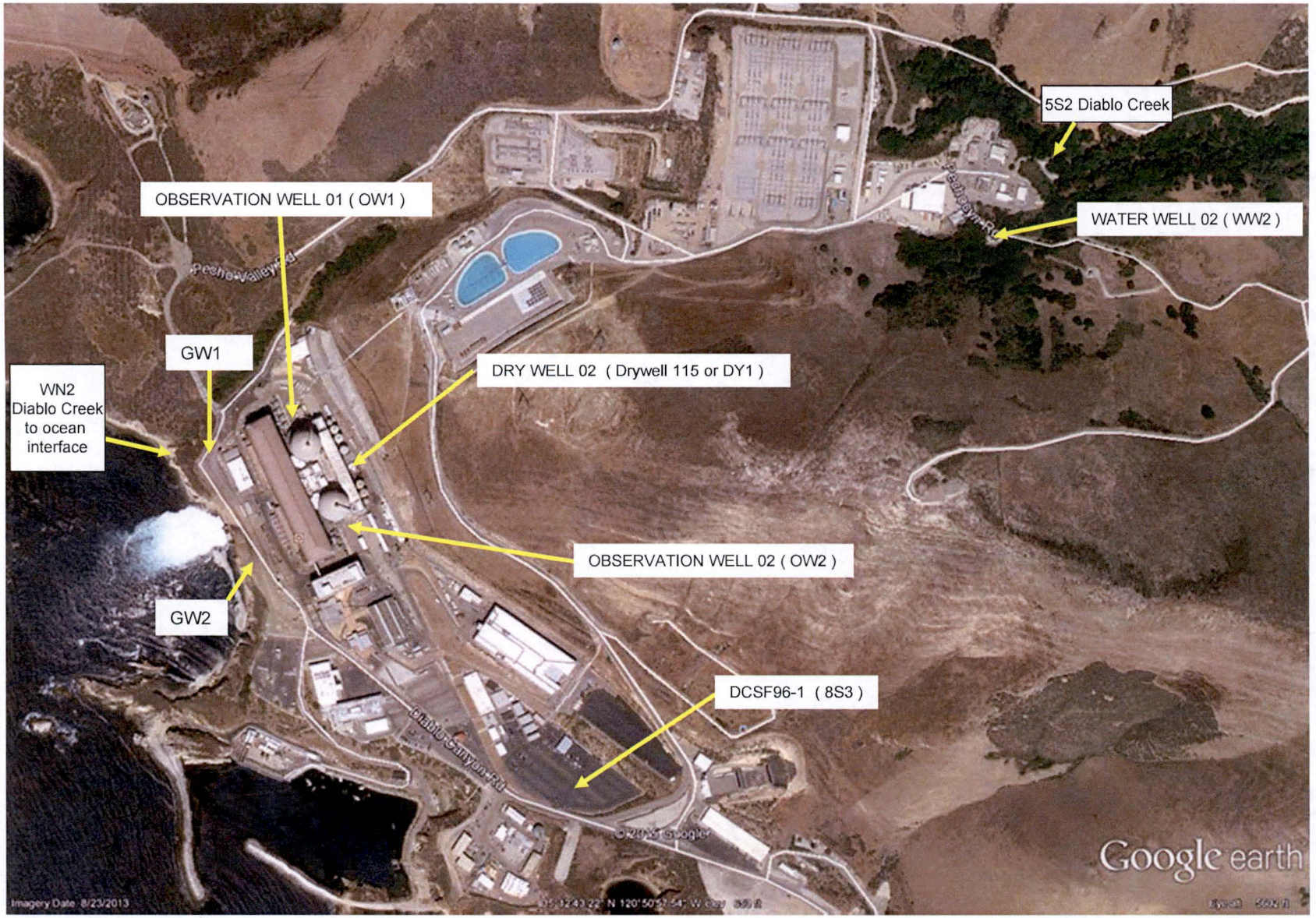
5S2 Diablo Creek
OBSERVATION WELL 01 (OW1)
WATER WELL 02 (WW2)
GW1
DRY WELL 02 (Drywell 115 or DY1)
WN2
Diablo Creek
to ocean
interface
OBSERVATION WELL 02 (OW2)
GW2
DCSF96-1 (8S3)
Google earth
Imagery Date: 8/23/2013

WELL ID
WATER SURFACE ELEVATION

LINE OF ESTIMATED POTENTIOMETRIC SURFACE

Cardno ENTRIX

GROUNDWATER GRADIENT MAP
PACIFIC GAS AND ELECTRIC
DIABLO CANYON NUCLEAR POWER PLANT
SAN LUIS OBISPO COUNTY, CALIFORNIA

FIGURE
SITE LOCATION

6.0 OLD STEAM GENERATOR STORAGE FACILITY MONITORING

In accordance with the DCPP Offsite Dose Calculation Manual (ODCM), the Old Steam Generator Storage Facility (OSGSF) in-building sumps were inspected quarterly. If water was found in the sump of a vault containing plant equipment, the expectation was to sample that sump water and dispose of the water per plant protocols via an approved discharge pathway.

For reference, the following equipment was placed into this OSGSF on the following dates:

- 3/2/08 (outage 2R14), four DCPP Unit Two (U-2) Steam Generators
- 2/14/09 (outage 1R15), four DCPP Unit One (U-1) Steam Generators
- 11/6/09 (outage 2R15), one DCPP Unit Two (U-2) Reactor (Rx) Head
- 10/23/10 (outage 1R16), one DCPP Unit One (U-1) Rx Head

As of 10/23/10, the OSGSF contains eight old Steam Generators and two old Rx Heads.

No water was found in any OSGSF sumps during 2015 inspections.

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7.0 CROSS CHECK PROGRAM

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8.0 DCPP LAND USE CENSUS

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2015 DCPP Land Use Census

Diablo Canyon Power Plant (DCPP) was owned and operated by Pacific Gas & Electric (PG&E) Company. PG&E owned and provided environmental stewardship to approximately 14 miles of Pacific Ocean coastline and approximately 13,000 acres surrounding the 1,000 acre DCPP site boundary. The PG&E property extended roughly from Avila Beach to Montana de Oro State Park. DCPP was located approximately seven miles WNW of Avila Beach and approximately four miles SSE of Montana de Oro State Park.

DCPP Radiological Environmental Monitoring Program (REMP) personnel conducted a Land Use Census (LUC) in the vicinity of DCPP for 2015. The LUC was based on Nuclear Regulatory Commission (NRC) Regulatory Guide 4.8, "Environmental Technical Specifications for Nuclear Power Plants". The LUC also provided compliance with 10 CFR 50 Appendix I Section IV (B)(3); "Identify changes in the use of unrestricted areas (e.g., for agricultural purposes) to permit modifications in monitoring programs for evaluating doses to individuals from principal pathways of exposure".

DCPP Program Directive CY2, "Radiological Monitoring and Controls Program" required performance of a LUC. DCPP procedure RP1.ID11, "Environmental Radiological Monitoring Procedure", required identification of the nearest milk animal, nearest residence, and the nearest broadleaf producing garden greater than 50 square meters (500 square feet) in each of the landward meteorological sectors within a radial distance of 8 kilometers (5 miles) of the Unit One Containment (CTMT) structure. A LUC was conducted at least once per year during the growing season (between Feb 15 and Dec 1) for the Diablo Canyon environs.

The 2015 LUC was conducted via a helicopter over-flight and landowner telephone interviews. The helicopter over-flight was conducted on March 5th, 2015. Telephone interviews were conducted March 10th through November 25th, 2015. Ten individual landowners or tenants were contacted.

Milk:

No milk animals were identified within the first 8 kilometers (5 miles) of any sector.

Residences:

The nearest residence, relative to all sectors, was a small trailer located in the NNW sector about 2.42 kilometers (1.5 miles) from the plant. One ranch worker occupied this BLANCHARD trailer approximately 1 day per week (midweek) during the year.

A total of eighteen structures were identified within the 8-kilometer (5-mile) radius of the plant, which were confirmed or appear to have been occupied in 2015. A new structure (trailer) was identified in the ESE sector at 5.42 km (3.37 miles). Six abandoned structures were identified during the LUC.

The nearest residence in each sector was summarized in Table 8.

Gardens:

The LUC identified two household gardens greater than 50 square meters (500 square feet) that produced broadleaf vegetation. The READ garden (REMP station 3C1) was approximately ¼ acre and located in the NNE sector at 7.13 kilometers (4.43 miles). The KOONZE garden (REMP station 6C1) was approximately 500 square feet and located in the E sector at 7.43 kilometers (4.62 miles).

MELLO managed a farm in the ESE sector along the southern site access road coastal plateau. The farm started at approximately 4.8 km (3 mi) and extended to 7.8 km (4.8 mi) from the site. This commercial farm produced no broadleaf vegetation. The farm area was about 100 acres of land with rotational planting. Commercial crops consisted of about 100% cereal grass (oat hay) and straw grass. Less than 10 farm workers periodically occupied this area during the growing season.

Additional Land Use:

It should be noted that the term "site-boundary" referred to the area within a radius of approximately 1.2 km (0.74 mi) from the Unit One CTMT structure. The area outside the "site-boundary" was also referred to as the "unrestricted area". Much of the area outside the site-boundary was routinely used for rotational cattle grazing by five separate cattle operations. For purposes of this land use census, the five cattle ranches were called BLANCHARD, SINSHEIMER, READ, ANDRE, and MELLO.

BLANCHARD solely allowed cattle to graze within DCPP environs in 2015. BLANCHARD did not graze any goats or sheep within 8 km (5 miles) of DCPP in 2015 due to extreme drought conditions in San Luis Obispo County.

BLANCHARD's livestock were sold under the "Old Creek Ranch" label at local farmer's markets in 2015. "Old Creek Ranch" labeled meats were sampled quarterly by REMP personnel in 2015. The REMP station codes were BCM, BGM, and BSM (if available).

SINSHEIMER had about 100 cattle outside the site-boundary in the NNE sector. These cattle were allowed to breed and about 90 calves were sold to mass market in 2015.

READ had about 72 adult cattle and 68 calves outside the site-boundary in the NNE sector. About 68 yearling cattle were sold to mass market in 2015.

ANDRE had about 80 cattle outside the site-boundary in the ENE sector. About 80 calves were sold to mass market in 2015. ANDRE did not slaughter any cattle in 2015 for personal consumption.

MELLO managed about 800 cattle outside the site-boundary in the E, ESE, and SE sectors. Harris Ranch Beef Corporation owned these cattle and sold all of them to mass market in 2015. MELLO did not slaughter any cattle in 2015 for personal consumption.

Two landowners (JOHE and ANDRE) harvested wild game for personal consumption outside the site-boundary in the NNE, NE, and ENE sectors. This wild game consisted of approximately two deer per landowner.

There was a California State Park Ranger Office in the NNW sector at 7.48 kilometers (4.65 miles) from the site. Approximately three State Parks staff personnel occupied this office from 1000 to 1500 each day (365 days per year).

There was a public campground (Islay Creek Campground) located in the NNW sector at Montana de Oro State Park at 7.36 kilometers (4.57 miles). This campground was near Spooner's Cove.

Approximately 713,000 people visited Montana de Oro State Park via day-use permit.

Approximately 22,000 people spent the night at Islay Creek Campground.

There was public access to hiking trails at the north and south ends of the PG&E property in 2015.

The Point Buchon Trail was located at the north end of PG&E property and had about 18,000 visitors in 2015. The trail traversed about 3.5 miles of coastline from Coon Creek to Crowbar Canyon. The trail was open to the public for day hikes Thursday thru Monday from approximately 0800-1700. Two to three people from California Land Management occupied the trail head booth near Coon Creek during operational days from 0700 to 1730. This trail was originally opened to the public on July 13, 2007.

The Pecho Coast Trail was located at the south end of PG&E property and had about 3,000 visitors in 2015. The trail was approximately 3.7 miles long and led from the Avila Beach DCPP entrance gate to the Point San Luis Lighthouse property and up the coastline to Rattlesnake Canyon. Access was controlled (via web-site reservation permission only) and conducted by docents. This trail was just slightly outside the 5 mile radius of the site. Pecho Coast Trail hikes were only available on Wednesdays (about 20 people) and Saturdays (about 40 people).

Thirty to forty Port San Luis Lighthouse keepers occupied the lighthouse grounds on Tuesdays, Thursdays, and Saturdays from 0800-1600. Special events were also held at the lighthouse throughout the year (e.g. weddings, fundraisers, reunions, etc). The lighthouse property was owned by the Port San Luis Harbor District.

Groundwater Protection Initiative (GPI) Review:

There were no site construction activities or spills that warranted changes to GPI monitoring frequencies, monitoring locations, contract lab analytical capabilities, or analytical detection thresholds in 2015.

There were no changes in on-site or near site groundwater usage. Groundwater beneath the site power block was not used as a source of drinking water.

Additional On-site Information:

The Old Steam Generator Storage Facility (OSGSF) was located within the site-boundary in the ENE sector (68.3 degrees) at 0.99 km (0.61 mi) from Unit One CTMT.

The following plant equipment was placed into the Old Steam Generator Storage Facility for the duration of the plant operating license on the dates indicated below.

Unit One old steam generators (4 total) : 2/14/2009
Unit Two old steam generators (4 total) : 3/2/2008
Unit One old reactor head (1 total) : 10/23/2010
Unit Two old reactor head (1 total) : 11/6/2009

The on-site Independent Spent Fuel Storage Installation (ISFSI) pad was located within the site-boundary in the ENE sector (58.47 degrees) at 0.36 km (0.22 mi) from Unit One CTMT.

DCPP loaded it's first ISFSI dry cask onto the pad on 6/23/2009.

The fifth ISFSI (dry cask) loading campaign occurred from May 1st to July 3rd in 2015.
Eight dry casks were added to the ISFSI pad in 2015.

Table 8 summarizes the nearest residence location in each meteorological sector.
The Land Use Figure shows the location of the residences and gardens in the vicinity of DCPP.

Table 8

Land Use Census 2015

Distance in Kilometers (and Miles) from the center point of U-1 CTMT
Nearest Milk Animal, Residence, and Vegetable Garden

22½ Degree [a] Radial Sector	Nearest Milk Animal	Nearest Residence km (mi)	Residence Azimuth Degree	Nearest Vegetable Garden km (mi)
NW	None	5.76 (3.58)	325.2	None
NNW	None	2.42 (1.5) [b]	332.0	None
N	None	None	—	None
NNE	None	5.18 (3.22)	21.5	7.13 (4.4) [c]
NE	None	7.94 (4.94)	36.4	None
ENE	None	7.15 (4.45)	63.8	None
E	None	5.97 (3.71)	89.9	7.43 (4.6) [d]
ESE	None	5.42 (3.37)	122.0	5.31 (3.3) [e]
SE	None	None	—	None

Table Notation:

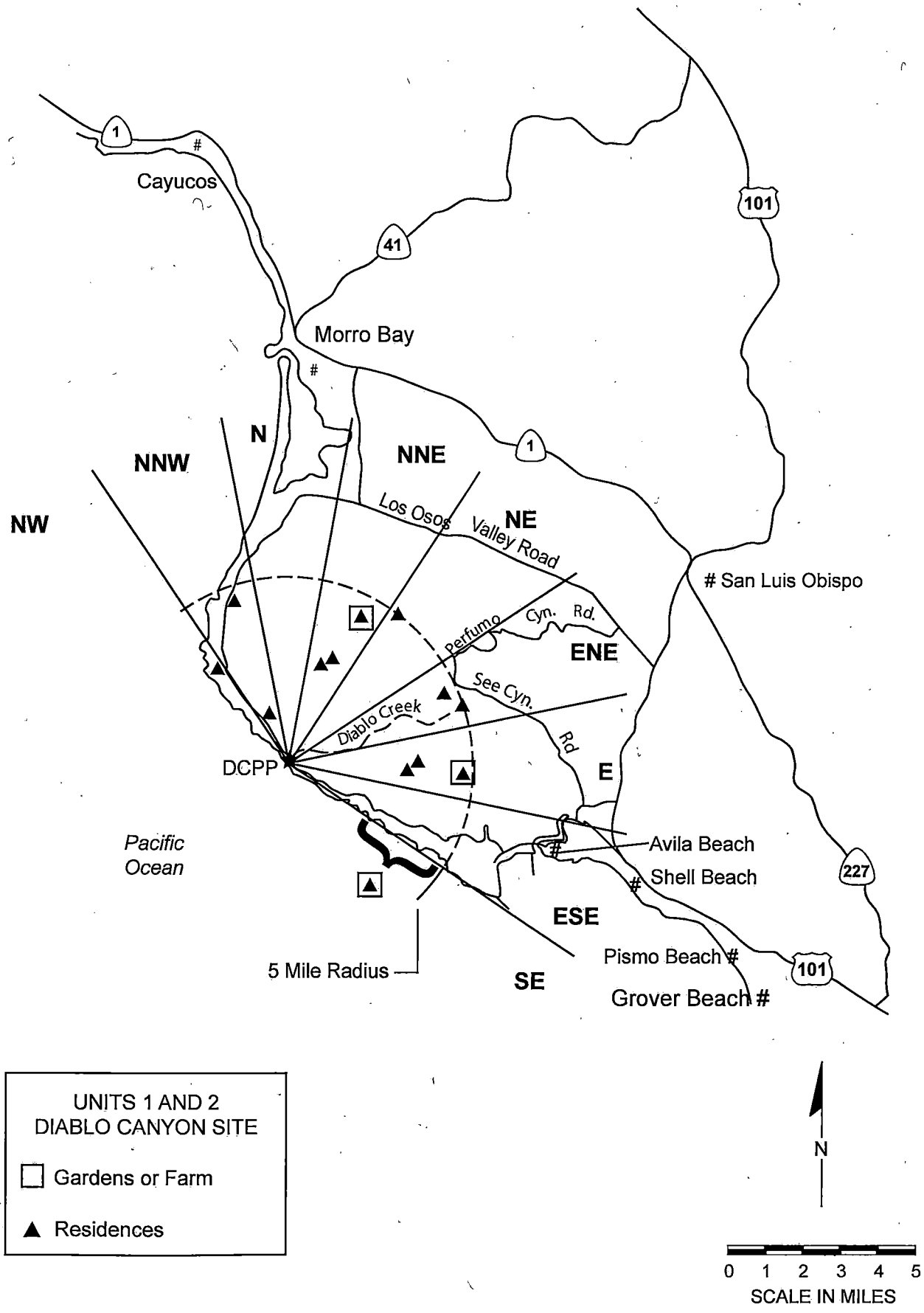
[a] Sectors not shown contain no land (other than islets not used for the purposes indicated in this table) beyond the site-boundary.

[b] BLANCHARD trailer is the residence used for critical receptor calculations.

[c] The READ (station 3C1) vegetable garden is located in the NNE sector and located at the 20.24 azimuth degree. There is also a limited use residence at this location.

[d] The KOONZE (station 6C1) vegetable garden is located in the E sector and located at the 97.52 azimuth degree. There is also a full time residence at this location.

[e] The MELLO garden is the commercial farm along the westward side of the site access road; however, it does not produce broadleaf vegetation. This farm extends from 4.8 km to 7.8 km (3 to 4.8 miles) from the plant.



Units 1 and 2 Diablo Canyon Power Plant Land Use Census.

9.0 DCPP WIND ROSE CHART

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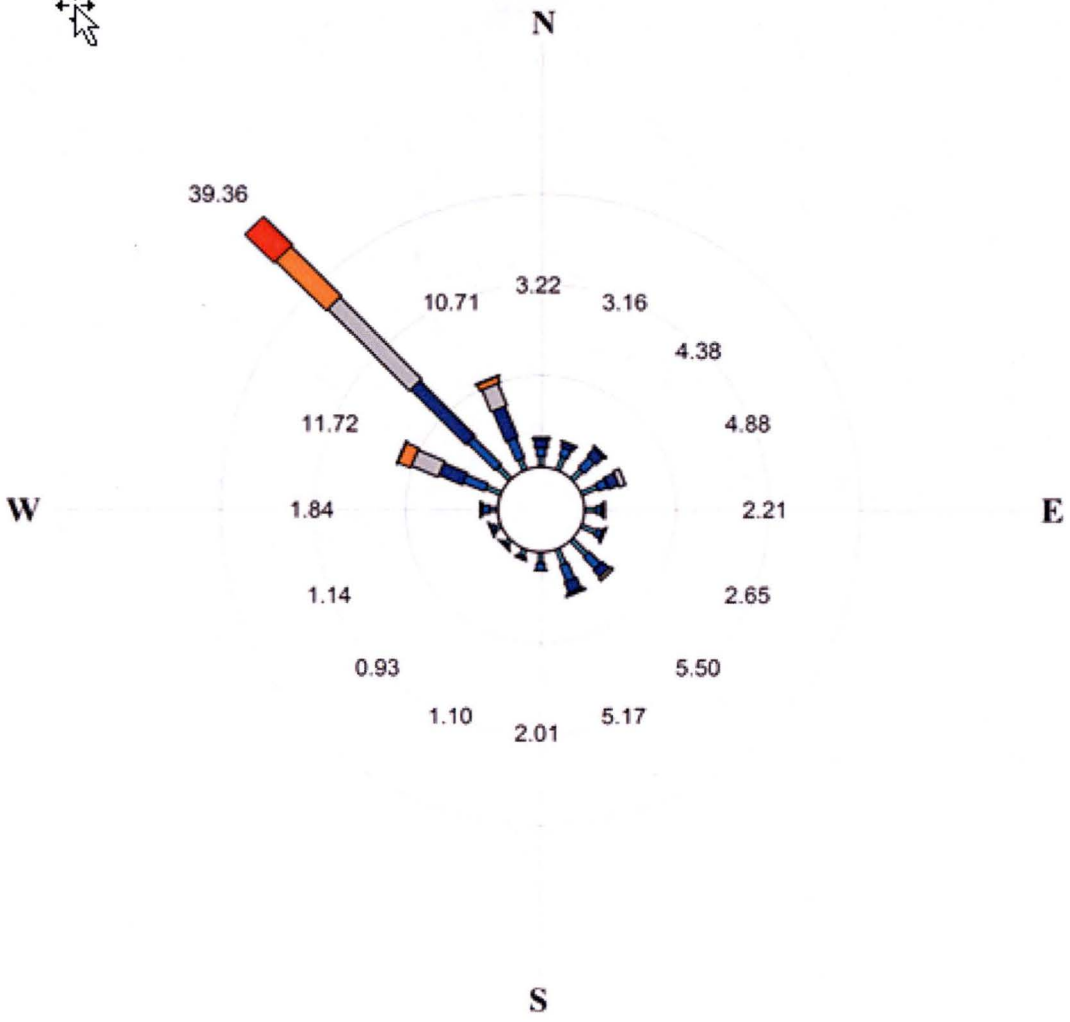
Joint Frequency Distribution
Wind Speed and Wind Direction
Diablo Canyon Power Plant
10 Meter Level 2015



Calms excluded.
Rings drawn at 10% intervals.
Wind flow is FROM the directions shown.
603 observations were missing.

PERCENT OCCURRENCE: Wind Speed (Miles Per Hour)
LOWER BOUND OF CATEGORY

DIR	0.1	3.5	6.9	11.5	18.4	24.2
N	1.15	0.91	0.93	0.23	0.00	0.00
NNE	1.56	0.97	0.58	0.06	0.00	0.00
NE	1.48	1.57	1.13	0.18	0.01	0.00
ENE	1.90	1.07	1.20	0.71	0.00	0.00
E	1.29	0.53	0.26	0.13	0.00	0.00
ESE	1.78	0.60	0.18	0.09	0.00	0.00
SE	2.26	1.80	1.07	0.38	0.00	0.00
SSE	1.80	1.86	1.23	0.22	0.06	0.00

TOTAL OBS = 8157 MISSING OBS = 603

PERCENT OCCURRENCE: Wind Speed (Miles Per Hour)
LOWER BOUND OF CATEGORY

DIR	0.1	3.5	6.9	11.5	18.4	24.2
S	1.21	0.77	0.02	0.00	0.00	0.00
SSW	0.76	0.29	0.04	0.01	0.00	0.00
SW	0.56	0.27	0.07	0.02	0.00	0.00
WSW	0.61	0.38	0.12	0.02	0.00	0.00
W	0.85	0.74	0.23	0.02	0.00	0.00
WNW	1.75	2.45	2.78	3.14	1.46	0.13
NW	1.89	4.19	8.50	12.68	7.74	4.38
NNW	1.32	2.34	3.67	2.62	0.65	0.11

CALM OBS = 0

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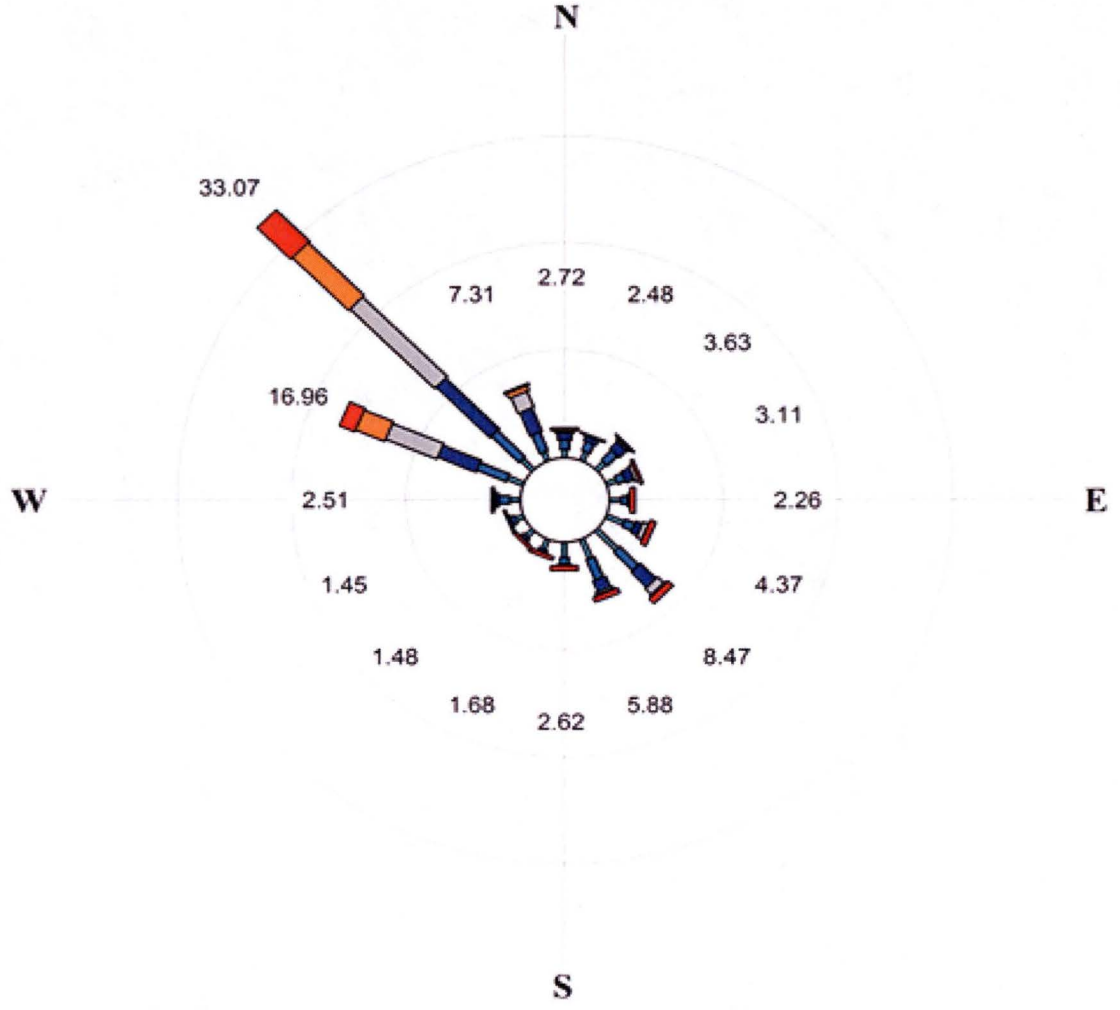
Joint Frequency Distribution
Wind Speed and Wind Direction
Diablo Canyon Power Plant
10 Meter Level 2011-2015



Calms excluded.
Rings drawn at 10% intervals.
Wind flow is FROM the directions shown.
2155 observations were missing.

PERCENT OCCURRENCE: Wind Speed (Miles Per Hour)
LOWER BOUND OF CATEGORY

DIR	0.1	3.5	6.9	11.5	18.4	24.2
N	0.76	0.89	0.62	0.22	0.02	0.21
NNE	0.92	0.90	0.45	0.07	0.01	0.13
NE	0.97	1.28	0.95	0.26	0.03	0.14
ENE	0.94	0.80	0.75	0.36	0.00	0.26
E	1.04	0.55	0.18	0.06	0.01	0.42
ESE	1.70	0.99	0.60	0.51	0.07	0.49
SE	2.54	2.44	1.96	0.79	0.16	0.58
SSE	1.94	2.05	1.04	0.26	0.13	0.47

TOTAL OBS = 41669 MISSING OBS = 2155

PERCENT OCCURRENCE: Wind Speed (Miles Per Hour)
LOWER BOUND OF CATEGORY

DIR	0.1	3.5	6.9	11.5	18.4	24.2
S	1.39	0.67	0.11	0.02	0.00	0.43
SSW	0.98	0.31	0.06	0.01	0.00	0.32
SW	0.81	0.32	0.08	0.01	0.00	0.25
WSW	0.74	0.40	0.12	0.02	0.00	0.17
W	0.91	0.94	0.31	0.13	0.02	0.20
WNW	1.55	2.76	3.62	4.83	2.74	1.46
NW	1.42	3.47	6.65	10.41	6.95	4.18
NNW	0.87	1.85	2.35	1.62	0.45	0.19

CALM OBS = 0

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10.0 REFERENCES

1. DCPP Interdepartmental Administrative Procedure (IDAP), RP1.ID11, "Environmental Radiological Monitoring Procedure."

2. NRC Radiological Assessment Branch Technical Position on Environmental Monitoring, Revision 1, November 1979 (NUREG-1301)

3. DCPP Program Directive, CY2, "Radiological Monitoring and Controls Program."

4. NEI 07-07, "Industry Ground Water Protection – Final Guidance Document", August 2007

5. NRC Regulatory Issue Summary 2008-03, "Return/Re-use of Previously Discharged Radioactive Effluents"; February 13, 2008

6. "Groundwater Gradient Analysis", by Entrix Corporation, March 2010

7. "Groundwater Gradient Analysis", by Cardno/Entrix Corporation, June 2012

8. Diablo Canyon Power Plant Site Conceptual Model Report, by ERM July 30, 2014

9. ANSI/HPS N13.37-2014, "Environmental Dosimetry - Criteria for System Design and Implementation"

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APPENDIX A
ANALYTICAL SAMPLE RESULTS

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2015 DCPP REMP Analysis Results Appendix A

0S2 North Gate - Air Charcoal

Sample Name	Date Collected	Nuclide	Result	MDC	2 Sigma TPU	Units
0S2 North Gate(364535014) - AC	3-Jan-15	Iodine-131	1.60E-03	9.77E-03	5.48E-03	pCi/m3
0S2 North Gate(365107014) - AC	10-Jan-15	Iodine-131	1.99E-04	1.37E-02	7.98E-03	pCi/m3
0S2 North Gate(365598014) - AC	17-Jan-15	Iodine-131	5.34E-03	1.28E-02	7.32E-03	pCi/m3
0S2 North Gate(366039014) - AC	24-Jan-15	Iodine-131	4.34E-03	9.72E-03	5.69E-03	pCi/m3
0S2 North Gate(366510014) - AC	31-Jan-15	Iodine-131	3.02E-03	1.12E-02	6.47E-03	pCi/m3
0S2 North Gate(367027013) - AC	7-Feb-15	Iodine-131	-2.25E-03	7.45E-03	4.74E-03	pCi/m3
0S2 North Gate(367398014) - AC	14-Feb-15	Iodine-131	-1.89E-04	1.44E-02	8.42E-03	pCi/m3
0S2 North Gate(367754014) - AC	21-Feb-15	Iodine-131	2.49E-03	1.40E-02	8.00E-03	pCi/m3
0S2 North Gate(368316014) - AC	28-Feb-15	Iodine-131	3.37E-03	1.74E-02	9.99E-03	pCi/m3
0S2 North Gate(368671014) - AC	7-Mar-15	Iodine-131	3.09E-03	1.04E-02	5.88E-03	pCi/m3
0S2 North Gate(369085014) - AC	14-Mar-15	Iodine-131	5.65E-04	8.75E-03	5.11E-03	pCi/m3
0S2 North Gate(369559014) - AC	21-Mar-15	Iodine-131	-4.99E-03	1.23E-02	8.06E-03	pCi/m3
0S2 North Gate(369948013) - AC	28-Mar-15	Iodine-131	5.50E-04	1.01E-02	6.05E-03	pCi/m3
0S2 North Gate(370730013) - AC	4-Apr-15	Iodine-131	9.09E-04	9.94E-03	5.89E-03	pCi/m3
0S2 North Gate(371198013) - AC	11-Apr-15	Iodine-131	-9.01E-04	9.57E-03	5.85E-03	pCi/m3
0S2 North Gate(371634014) - AC	18-Apr-15	Iodine-131	-6.56E-04	8.38E-03	4.97E-03	pCi/m3
0S2 North Gate(372080014) - AC	26-Apr-15	Iodine-131	-1.85E-03	7.50E-03	4.85E-03	pCi/m3
0S2 North Gate(372573014) - AC	2-May-15	Iodine-131	-1.70E-03	1.52E-02	9.14E-03	pCi/m3
0S2 North Gate(373065014) - AC	9-May-15	Iodine-131	2.91E-03	1.22E-02	6.82E-03	pCi/m3
0S2 North Gate(373540014) - AC	16-May-15	Iodine-131	8.29E-03	1.33E-02	7.94E-03	pCi/m3
0S2 North Gate(373878013) - AC	23-May-15	Iodine-131	1.53E-03	1.04E-02	5.93E-03	pCi/m3
0S2 North Gate(374367015) - AC	30-May-15	Iodine-131	-3.48E-03	7.33E-03	5.25E-03	pCi/m3
0S2 North Gate(374810010) - AC	6-Jun-15	Iodine-131	-3.27E-03	1.02E-02	8.05E-03	pCi/m3
0S2 North Gate(375327013) - AC	13-Jun-15	Iodine-131	1.82E-03	9.78E-03	5.71E-03	pCi/m3
0S2 North Gate(375745013) - AC	20-Jun-15	Iodine-131	-1.34E-03	8.37E-03	5.28E-03	pCi/m3
0S2 North Gate(376116012) - AC	27-Jun-15	Iodine-131	4.29E-03	1.16E-02	7.08E-03	pCi/m3
0S2 North Gate(376776015) - AC	4-Jul-15	Iodine-131	1.01E-02	1.82E-02	1.06E-02	pCi/m3
0S2 North Gate(377306013) - AC	11-Jul-15	Iodine-131	2.28E-03	1.88E-02	1.10E-02	pCi/m3
0S2 North Gate(377783013) - AC	18-Jul-15	Iodine-131	-2.45E-03	8.83E-03	5.80E-03	pCi/m3
0S2 North Gate(378239013) - AC	25-Jul-15	Iodine-131	4.51E-03	1.24E-02	7.79E-03	pCi/m3
0S2 North Gate(378741010) - AC	1-Aug-15	Iodine-131	-8.91E-04	1.22E-02	7.62E-03	pCi/m3
0S2 North Gate(379291013) - AC	8-Aug-15	Iodine-131	4.33E-03	1.06E-02	5.92E-03	pCi/m3
0S2 North Gate(379712013) - AC	15-Aug-15	Iodine-131	-1.51E-04	1.67E-02	1.01E-02	pCi/m3
0S2 North Gate(380128014) - AC	22-Aug-15	Iodine-131	5.97E-04	9.31E-03	6.29E-03	pCi/m3
0S2 North Gate(380527013) - AC	29-Aug-15	Iodine-131	-2.08E-03	1.15E-02	7.26E-03	pCi/m3
0S2 North Gate(380911013) - AC	5-Sep-15	Iodine-131	-1.75E-03	9.14E-03	5.86E-03	pCi/m3
0S2 North Gate(381297013) - AC	12-Sep-15	Iodine-131	-3.01E-03	1.65E-02	1.05E-02	pCi/m3
0S2 North Gate(381776013) - AC	19-Sep-15	Iodine-131	4.98E-03	9.16E-03	5.15E-03	pCi/m3
0S2 North Gate(382121013) - AC	26-Sep-15	Iodine-131	-2.12E-03	8.82E-03	6.53E-03	pCi/m3
0S2 North Gate(382853013) - AC	3-Oct-15	Iodine-131	-6.53E-03	1.16E-02	8.92E-03	pCi/m3
0S2 North Gate(383405002) - AC	10-Oct-15	Iodine-131	2.01E-03	1.10E-02	6.37E-03	pCi/m3
0S2 North Gate(383823013) - AC	17-Oct-15	Iodine-131	3.00E-03	1.20E-02	6.90E-03	pCi/m3
0S2 North Gate(384293003) - AC	24-Oct-15	Iodine-131	3.23E-03	7.95E-03	5.58E-03	pCi/m3

0S2 North Gate(384829014) - AC	31-Oct-15	Iodine-131	3.67E-03	1.17E-02	6.73E-03	pCi/m3
0S2 North Gate(385443013) - AC	7-Nov-15	Iodine-131	-4.22E-04	1.10E-02	6.55E-03	pCi/m3
0S2 North Gate(385912004) - AC	14-Nov-15	Iodine-131	-5.68E-03	1.07E-02	7.78E-03	pCi/m3
0S2 North Gate(386331002) - AC	21-Nov-15	Iodine-131	-1.41E-03	1.48E-02	8.81E-03	pCi/m3
0S2 North Gate(386665015) - AC	28-Nov-15	Iodine-131	8.54E-04	9.93E-03	6.08E-03	pCi/m3
0S2 North Gate(387181015) - AC	5-Dec-15	Iodine-131	9.59E-04	8.82E-03	5.00E-03	pCi/m3
0S2 North Gate(387767014) - AC	12-Dec-15	Iodine-131	1.48E-04	1.01E-02	5.84E-03	pCi/m3
0S2 North Gate(388120014) - AC	19-Dec-15	Iodine-131	-2.10E-03	1.40E-02	8.55E-03	pCi/m3
0S2 North Gate(388206014) - AC	25-Dec-15	Iodine-131	-3.47E-03	1.38E-02	9.06E-03	pCi/m3

0S2 North Gate - Air Carbon 14

Sample Name	Date Collected	Nuclide	Result	MDC	2 Sigma TPU	Units
0S2 North Gate(364535017) - AC14	3-Jan-15	Carbon-14	1.76E-07	5.50E-07	3.31E-07	uCi/m3
0S2 North Gate(365107017) - AC14	10-Jan-15	Carbon-14	1.85E-07	6.26E-07	3.76E-07	uCi/m3
0S2 North Gate(365598017) - AC14	17-Jan-15	Carbon-14	-2.46E-07	6.36E-07	3.74E-07	uCi/m3
0S2 North Gate(366039017) - AC14	24-Jan-15	Carbon-14	3.55E-07	6.57E-07	3.98E-07	uCi/m3
0S2 North Gate(366510017) - AC14	31-Jan-15	Carbon-14	4.91E-07	6.78E-07	4.13E-07	uCi/m3
0S2 North Gate(367027017) - AC14	7-Feb-15	Carbon-14	-1.70E-07	6.20E-07	3.66E-07	uCi/m3
0S2 North Gate(367398017) - AC14	14-Feb-15	Carbon-14	4.65E-08	6.77E-07	4.04E-07	uCi/m3
0S2 North Gate(367754017) - AC14	21-Feb-15	Carbon-14	4.36E-08	6.30E-07	3.76E-07	uCi/m3
0S2 North Gate(368316017) - AC14	28-Feb-15	Carbon-14	3.54E-07	6.23E-07	3.78E-07	uCi/m3
0S2 North Gate(368671017) - AC14	7-Mar-15	Carbon-14	3.07E-07	5.64E-07	3.42E-07	uCi/m3
0S2 North Gate(369085017) - AC14	14-Mar-15	Carbon-14	4.50E-07	5.95E-07	3.64E-07	uCi/m3
0S2 North Gate(369559017) - AC14	21-Mar-15	Carbon-14	1.42E-07	5.91E-07	3.55E-07	uCi/m3
0S2 North Gate(369948015) - AC14	28-Mar-15	Carbon-14	-1.27E-07	6.03E-07	3.57E-07	uCi/m3
0S2 North Gate(370730015) - AC14	4-Apr-15	Carbon-14	-2.39E-07	5.96E-07	3.50E-07	uCi/m3
0S2 North Gate(371198015) - AC14	11-Apr-15	Carbon-14	-1.82E-07	6.38E-07	3.77E-07	uCi/m3
0S2 North Gate(371634017) - AC14	18-Apr-15	Carbon-14	2.09E-07	6.23E-07	3.75E-07	uCi/m3
0S2 North Gate(372080017) - AC14	26-Apr-15	Carbon-14	3.62E-09	6.42E-07	3.83E-07	uCi/m3
0S2 North Gate(372573017) - AC14	2-May-15	Carbon-14	-3.34E-07	6.89E-07	4.04E-07	uCi/m3
0S2 North Gate(373065017) - AC14	9-May-15	Carbon-14	8.89E-08	6.87E-07	4.11E-07	uCi/m3
0S2 North Gate(373540015) - AC14	16-May-15	Carbon-14	-5.18E-07	6.32E-07	3.67E-07	uCi/m3
0S2 North Gate(373878015) - AC14	23-May-15	Carbon-14	-4.79E-07	7.02E-07	4.09E-07	uCi/m3
0S2 North Gate(374367016) - AC14	30-May-15	Carbon-14	1.52E-07	6.80E-07	4.08E-07	uCi/m3
0S2 North Gate(374810017) - AC14	6-Jun-15	Carbon-14	-1.14E-08	6.57E-07	3.91E-07	uCi/m3
0S2 North Gate(375327015) - AC14	13-Jun-15	Carbon-14	-1.33E-07	5.12E-07	3.03E-07	uCi/m3
0S2 North Gate(375745015) - AC14	20-Jun-15	Carbon-14	-3.27E-07	6.09E-07	3.57E-07	uCi/m3
0S2 North Gate(376116014) - AC14	27-Jun-15	Carbon-14	-7.95E-09	5.50E-07	3.27E-07	uCi/m3
0S2 North Gate(376776017) - AC14	4-Jul-15	Carbon-14	1.28E-07	6.11E-07	3.66E-07	uCi/m3
0S2 North Gate(377306015) - AC14	11-Jul-15	Carbon-14	1.00E-07	5.92E-07	3.55E-07	uCi/m3
0S2 North Gate(377783015) - AC14	18-Jul-15	Carbon-14	-1.55E-07	6.09E-07	3.60E-07	uCi/m3
0S2 North Gate(378239015) - AC14	25-Jul-15	Carbon-14	5.74E-07	5.89E-07	3.62E-07	uCi/m3
0S2 North Gate(378741012) - AC14	1-Aug-15	Carbon-14	3.40E-07	5.43E-07	3.30E-07	uCi/m3
0S2 North Gate(379291015) - AC14	8-Aug-15	Carbon-14	7.43E-08	5.78E-07	3.46E-07	uCi/m3
0S2 North Gate(379712015) - AC14	15-Aug-15	Carbon-14	3.83E-08	6.02E-07	3.60E-07	uCi/m3

0S2 North Gate(380128017) - AC14	22-Aug-15	Carbon-14	-4.23E-07	6.32E-07	3.69E-07	uCi/m3
0S2 North Gate(380527015) - AC14	29-Aug-15	Carbon-14	3.34E-08	6.00E-07	3.58E-07	uCi/m3
0S2 North Gate(380911015) - AC14	5-Sep-15	Carbon-14	-1.02E-07	6.50E-07	3.85E-07	uCi/m3
0S2 North Gate(381297015) - AC14	12-Sep-15	Carbon-14	-4.38E-07	5.70E-07	3.32E-07	uCi/m3
0S2 North Gate(381776015) - AC14	19-Sep-15	Carbon-14	-1.08E-07	5.89E-07	3.49E-07	uCi/m3
0S2 North Gate(382121015) - AC14	26-Sep-15	Carbon-14	-1.91E-07	5.22E-07	3.07E-07	uCi/m3
0S2 North Gate(382853015) - AC14	3-Oct-15	Carbon-14	2.49E-07	5.60E-07	3.38E-07	uCi/m3
0S2 North Gate(383405001) - AC14	10-Oct-15	Carbon-14	4.28E-07	5.68E-07	3.46E-07	uCi/m3
0S2 North Gate(383823015) - AC14	17-Oct-15	Carbon-14	1.14E-07	5.25E-07	3.15E-07	uCi/m3
0S2 North Gate(384293017) - AC14	24-Oct-15	Carbon-14	2.18E-07	5.60E-07	3.37E-07	uCi/m3
0S2 North Gate(384829017) - AC14	31-Oct-15	Carbon-14	-2.38E-07	5.40E-07	3.17E-07	uCi/m3
0S2 North Gate(385443015) - AC14	7-Nov-15	Carbon-14	-1.86E-07	5.37E-07	3.17E-07	uCi/m3
0S2 North Gate(385912003) - AC14	14-Nov-15	Carbon-14	1.91E-07	5.67E-07	3.41E-07	uCi/m3
0S2 North Gate(386331001) - AC14	21-Nov-15	Carbon-14	2.11E-07	6.56E-07	3.95E-07	uCi/m3
0S2 North Gate(386665017) - AC14	28-Nov-15	Carbon-14	-3.86E-07	5.32E-07	3.11E-07	uCi/m3
0S2 North Gate(387181016) - AC14	5-Dec-15	Carbon-14	-2.88E-07	5.96E-07	3.50E-07	uCi/m3
0S2 North Gate(387767015) - AC14	12-Dec-15	Carbon-14	-5.35E-08	5.57E-07	3.31E-07	uCi/m3
0S2 North Gate(388120015) - AC14	19-Dec-15	Carbon-14	-5.17E-07	6.87E-07	4.00E-07	uCi/m3
0S2 North Gate(388206015) - AC14	25-Dec-15	Carbon-14	-1.63E-07	6.27E-07	3.71E-07	uCi/m3

0S2 North Gate - Air Particulate

Sample Name	Date Collected	Nuclide	Result	MDC	2 Sigma TPU	Units
0S2 North Gate(364535007) - AP	3-Jan-15	BETA	5.46E-02	1.24E-03	1.21E-02	pCi/m3
0S2 North Gate(365107007) - AP	10-Jan-15	BETA	8.02E-02	1.26E-03	1.16E-02	pCi/m3
0S2 North Gate(365598007) - AP	17-Jan-15	BETA	4.17E-02	1.26E-03	1.15E-02	pCi/m3
0S2 North Gate(366039007) - AP	24-Jan-15	BETA	4.74E-02	1.38E-03	1.22E-02	pCi/m3
0S2 North Gate(366510007) - AP	31-Jan-15	BETA	7.45E-02	1.50E-03	1.14E-02	pCi/m3
0S2 North Gate(367027006) - AP	7-Feb-15	BETA	3.23E-02	1.27E-03	1.34E-02	pCi/m3
0S2 North Gate(367398008) - AP	14-Feb-15	BETA	3.69E-02	1.55E-03	1.32E-02	pCi/m3
0S2 North Gate(367754007) - AP	21-Feb-15	BETA	5.95E-02	1.40E-03	1.27E-02	pCi/m3
0S2 North Gate(368316007) - AP	28-Feb-15	BETA	1.51E-02	1.37E-03	1.16E-02	pCi/m3
0S2 North Gate(368671007) - AP	7-Mar-15	BETA	5.87E-02	1.36E-03	1.16E-02	pCi/m3
0S2 North Gate(369085007) - AP	14-Mar-15	BETA	2.77E-02	1.39E-03	1.31E-02	pCi/m3
0S2 North Gate(369559007) - AP	21-Mar-15	BETA	2.27E-02	1.38E-03	1.06E-02	pCi/m3
0S2 North Gate(369948014) - AP	28-Mar-15	BETA	1.71E-02	1.35E-03	1.07E-02	pCi/m3
0S2 North Gate(370730014) - AP	4-Apr-15	BETA	1.60E-02	1.49E-03	1.01E-02	pCi/m3
0S2 North Gate(371198014) - AP	11-Apr-15	BETA	8.44E-03	1.36E-03	1.14E-02	pCi/m3
0S2 North Gate(371634007) - AP	18-Apr-15	BETA	2.86E-02	1.37E-03	1.10E-02	pCi/m3
0S2 North Gate(372080007) - AP	26-Apr-15	BETA	1.97E-02	1.57E-03	1.07E-02	pCi/m3
0S2 North Gate(372573007) - AP	2-May-15	BETA	2.44E-02	1.48E-03	1.08E-02	pCi/m3
0S2 North Gate(373065007) - AP	9-May-15	BETA	1.32E-02	1.36E-03	1.05E-02	pCi/m3
0S2 North Gate(373540013) - AP	16-May-15	BETA	1.23E-02	1.47E-03	1.05E-02	pCi/m3
0S2 North Gate(373878014) - AP	23-May-15	BETA	9.04E-03	1.44E-03	1.31E-02	pCi/m3
0S2 North Gate(374367009) - AP	30-May-15	BETA	1.21E-02	1.36E-03	9.64E-03	pCi/m3
0S2 North Gate(374810011) - AP	6-Jun-15	BETA	9.38E-03	1.55E-03	1.30E-02	pCi/m3

0S2 North Gate(375327014) - AP	13-Jun-15	BETA	9.52E-03	1.44E-03	1.11E-02	pCi/m3
0S2 North Gate(375745014) - AP	20-Jun-15	BETA	1.84E-02	1.45E-03	1.14E-02	pCi/m3
0S2 North Gate(376116013) - AP	27-Jun-15	BETA	1.05E-02	1.35E-03	1.06E-02	pCi/m3
0S2 North Gate(376776016) - AP	4-Jul-15	BETA	4.79E-03	1.39E-03	1.15E-02	pCi/m3
0S2 North Gate(377306014) - AP	11-Jul-15	BETA	7.36E-03	1.25E-03	1.08E-02	pCi/m3
0S2 North Gate(377783014) - AP	18-Jul-15	BETA	1.78E-02	1.26E-03	1.02E-02	pCi/m3
0S2 North Gate(378239014) - AP	25-Jul-15	BETA	1.89E-02	1.30E-03	8.70E-03	pCi/m3
0S2 North Gate(378741011) - AP	1-Aug-15	BETA	2.09E-02	1.26E-03	9.70E-03	pCi/m3
0S2 North Gate(379291014) - AP	8-Aug-15	BETA	1.72E-02	1.37E-03	1.06E-02	pCi/m3
0S2 North Gate(379712014) - AP	15-Aug-15	BETA	1.84E-02	1.32E-03	1.05E-02	pCi/m3
0S2 North Gate(380128007) - AP	22-Aug-15	BETA	3.57E-02	1.40E-03	1.32E-02	pCi/m3
0S2 North Gate(380527014) - AP	29-Aug-15	BETA	1.40E-02	1.34E-03	1.11E-02	pCi/m3
0S2 North Gate(380911014) - AP	5-Sep-15	BETA	2.98E-02	1.35E-03	9.78E-03	pCi/m3
0S2 North Gate(381297014) - AP	12-Sep-15	BETA	2.17E-02	1.42E-03	1.20E-02	pCi/m3
0S2 North Gate(381776014) - AP	19-Sep-15	BETA	2.14E-02	1.48E-03	1.09E-02	pCi/m3
0S2 North Gate(382121014) - AP	26-Sep-15	BETA	2.11E-02	1.33E-03	9.64E-03	pCi/m3
0S2 North Gate(382853014) - AP	3-Oct-15	BETA	2.78E-02	1.43E-03	1.19E-02	pCi/m3
0S2 North Gate(383405003) - AP	10-Oct-15	BETA	4.50E-02	1.42E-03	1.12E-02	pCi/m3
0S2 North Gate(383823014) - AP	17-Oct-15	BETA	3.26E-02	1.42E-03	1.22E-02	pCi/m3
0S2 North Gate(384293006) - AP	24-Oct-15	BETA	3.70E-02	1.65E-03	1.01E-02	pCi/m3
0S2 North Gate(384829007) - AP	31-Oct-15	BETA	1.88E-02	1.68E-03	8.30E-03	pCi/m3
0S2 North Gate(385443014) - AP	7-Nov-15	BETA	2.50E-02	1.75E-03	8.78E-03	pCi/m3
0S2 North Gate(385912005) - AP	14-Nov-15	BETA	3.89E-02	1.75E-03	8.61E-03	pCi/m3
0S2 North Gate(386331003) - AP	21-Nov-15	BETA	3.26E-02	1.84E-03	8.36E-03	pCi/m3
0S2 North Gate(386665016) - AP	28-Nov-15	BETA	5.89E-02	1.32E-03	9.00E-03	pCi/m3
0S2 North Gate(387181014) - AP	5-Dec-15	BETA	3.78E-02	1.51E-03	1.08E-02	pCi/m3
0S2 North Gate(387767013) - AP	12-Dec-15	BETA	8.23E-03	1.61E-03	1.05E-02	pCi/m3
0S2 North Gate(388120013) - AP	19-Dec-15	BETA	1.15E-02	1.88E-03	9.82E-03	pCi/m3
0S2 North Gate(388206013) - AP	25-Dec-15	BETA	1.73E-02	1.58E-03	8.80E-03	pCi/m3
0S2 North Gate(371385007) - AP	14-Feb-15	Beryllium-7	1.43E-01	1.13E-02	2.24E-02	pCi/m3
0S2 North Gate(377522007) - AP	16-May-15	Beryllium-7	8.18E-02	1.00E-02	1.60E-02	pCi/m3
0S2 North Gate(383567007) - AP	15-Aug-15	Beryllium-7	9.85E-02	7.76E-03	1.93E-02	pCi/m3
0S2 North Gate(389387007) - AP	14-Nov-15	Beryllium-7	1.20E-01	9.79E-03	1.94E-02	pCi/m3
0S2 North Gate(371385007) - AP	14-Feb-15	Cesium-134	6.49E-05	7.29E-04	4.14E-04	pCi/m3
0S2 North Gate(377522007) - AP	16-May-15	Cesium-134	-1.52E-04	7.74E-04	4.97E-04	pCi/m3
0S2 North Gate(383567007) - AP	15-Aug-15	Cesium-134	-2.65E-04	5.47E-04	4.31E-04	pCi/m3
0S2 North Gate(389387007) - AP	14-Nov-15	Cesium-134	-2.54E-04	4.65E-04	4.23E-04	pCi/m3
0S2 North Gate(371385007) - AP	14-Feb-15	Cesium-137	1.48E-04	6.47E-04	3.69E-04	pCi/m3
0S2 North Gate(377522007) - AP	16-May-15	Cesium-137	3.57E-04	6.05E-04	3.20E-04	pCi/m3
0S2 North Gate(383567007) - AP	15-Aug-15	Cesium-137	2.04E-05	6.23E-04	3.76E-04	pCi/m3
0S2 North Gate(389387007) - AP	14-Nov-15	Cesium-137	-8.35E-05	4.60E-04	3.53E-04	pCi/m3

2015 DCPP REMP Analysis Results Appendix A

1A2 Blanchard Spring - Drinking Water

Sample Name	Date Collected	Nuclide	Result	MDC	2 Sigma TPU	Units
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	BETA	-4.82E-01	2.37E+00	1.41E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	BETA	2.73E+00	2.23E+00	1.54E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	BETA	2.04E+00	2.82E+00	1.77E+00	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	BETA	2.73E+00	3.58E+00	2.27E+00	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	BETA	1.19E-01	2.53E+00	1.52E+00	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Barium-140	4.81E-01	9.26E+00	5.40E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Barium-140	-1.74E+00	8.85E+00	5.26E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Barium-140	6.47E+00	1.04E+01	6.54E+00	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Barium-140	-1.40E+00	9.81E+00	5.84E+00	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Barium-140	3.26E+00	8.90E+00	5.45E+00	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Cesium-134	4.65E-01	2.32E+00	1.38E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Cesium-134	3.55E-01	2.09E+00	1.24E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Cesium-134	-2.83E-01	2.24E+00	1.39E+00	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Cesium-134	1.06E+00	2.00E+00	1.93E+00	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Cesium-134	-4.80E-01	1.94E+00	1.20E+00	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Cesium-137	1.81E-01	2.22E+00	1.50E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Cesium-137	5.14E-01	1.95E+00	1.30E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Cesium-137	-5.60E-01	2.31E+00	1.44E+00	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Cesium-137	-6.96E-01	1.93E+00	1.22E+00	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Cesium-137	8.61E-01	2.06E+00	1.37E+00	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Cobalt-58	1.25E+00	1.98E+00	1.90E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Cobalt-58	-9.64E-01	1.69E+00	1.51E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Cobalt-58	-7.61E-01	1.99E+00	1.26E+00	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Cobalt-58	-3.31E-01	1.90E+00	1.35E+00	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Cobalt-58	-3.94E-01	1.97E+00	1.21E+00	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Cobalt-60	1.16E-01	2.28E+00	1.34E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Cobalt-60	1.51E-01	2.04E+00	1.20E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Cobalt-60	1.22E+00	2.55E+00	1.51E+00	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Cobalt-60	2.89E-01	2.10E+00	1.22E+00	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Cobalt-60	-6.50E-02	2.20E+00	1.63E+00	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Iodine-131	-1.01E-01	4.00E-01	2.44E-01	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Iodine-131	1.41E-01	5.34E-01	3.12E-01	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Iodine-131	-2.28E-01	6.68E-01	4.21E-01	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Iodine-131	-1.27E-01	4.16E-01	2.59E-01	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Iodine-131	1.43E-01	7.16E-01	4.23E-01	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Iron-55	2.13E+01	6.75E+01	4.68E+01	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Iron-55	5.63E+01	8.95E+01	6.91E+01	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Iron-55	8.09E+00	8.65E+01	6.50E+01	pCi/L
1A2 Blanchard Spring(383939001) - DW	21-Oct-15	Iron-55	-2.84E+01	6.67E+01	4.58E+01	pCi/L
1A2 Blanchard Spring(387205001) - DW	8-Dec-15	Iron-55	-1.74E+00	3.68E+01	2.48E+01	pCi/L
1A2 Blanchard Spring(365880002) - DW	26-Jan-15	Iron-59	-1.82E+00	4.02E+00	2.61E+00	pCi/L
1A2 Blanchard Spring(371630005) - DW	21-Apr-15	Iron-59	-1.96E+00	3.28E+00	2.24E+00	pCi/L
1A2 Blanchard Spring(377777002) - DW	21-Jul-15	Iron-59	3.49E+00	5.04E+00	3.27E+00	pCi/L