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April 18, 2007

U.S. Nuclear Regulatory Commission
Region IV Administrator
611 Ryan Plaza Drive, Suite 100
Arlington, TX 76011-8064

Docket No. 50-312
Rancho Seco Nuclear Generating Station
License No. DPR-54

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 2006

Attention: Region IV Administrator

In accordance with Rancho Seco Quality Manual Appendix A, Section 1.5.3, we are submitting the Rancho Seco 2006 Annual Radiological Environmental Operating Report for the period of January 1, 2006 through December 31, 2006.

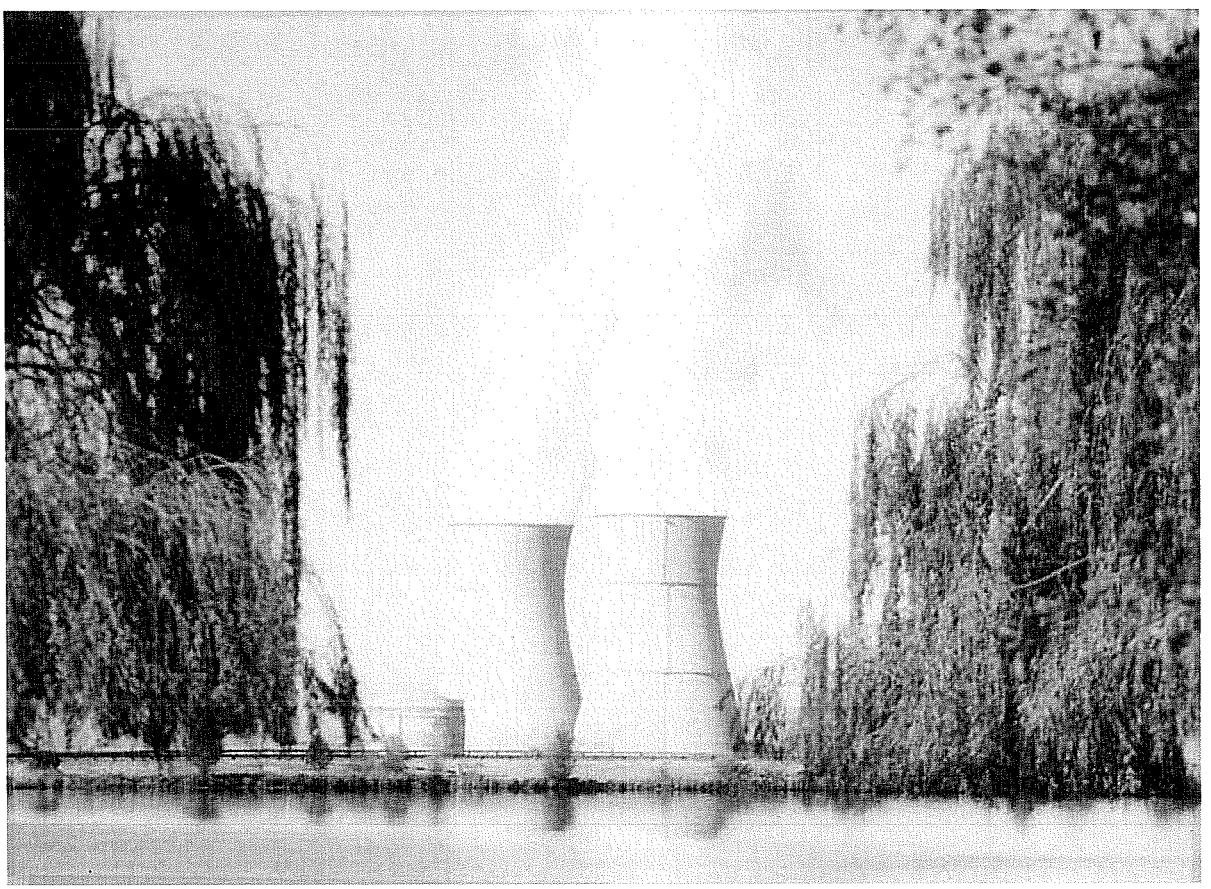
If you or members of your staff have questions requiring additional information or clarification, please contact Bob Jones at (916) 732-4843.

Sincerely,

Steve Redeker
Manager Plant Closure & Decommissioning

Cc: NRC, Region VI

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT



JANUARY - DECEMBER 2006

Rancho Seco Nuclear Station
Herald, California

10 CFR Part 50 License Number DPR-54

10 CFR Part 72 License Number SNM 2510

2006 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

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2006 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

I. EXECUTIVE SUMMARY

This report contains results from the Radiological Environmental Monitoring Program (REMP) for the Rancho Seco Nuclear Station (RSNS) compiled for the period January 1, 2006 through December 31, 2006. The Radiation Protection/ Chemistry Group at RSNS conducts this program in accordance with the REMP manual. This report is compiled and submitted in accordance with the Rancho Seco Quality Manual, Appendix A, Section 1.5.2.3 [RS02].

The results of the 2006 Radiological Environmental Monitoring Program showed that the operation of Rancho Seco Nuclear Station had no significant radiological impact on the environment.

Currently, the Plant is permanently shutdown and undergoing Decommissioning. Fuel transfer to the Independent Spent Fuel Storage Installation (ISFSI) was completed on August 21, 2002. Consumes Power Plant commenced operation in 2006. It is a 500 megawatt natural gas turbine generating station located in the south west corner of the Rancho Seco Owner Controlled Area.

During the reporting period, the atmospheric, terrestrial and aquatic environs adjacent to RSNS were monitored. The sample measurements showed that the levels of radioactivity in the sampled media were consistent with previous year's evaluations. All detected nuclides (greater than minimum detected activity) were below the required Nuclear Regulatory commission (NRC) reporting levels. All Lower Limits of Detection (LLD) were at or lower than the maximum required by the NRC.

Doses resulting from ambient exposure to terrestrial and atmospheric direct radiation sources were measured through the placement and retrieval of Luxel monitoring badges. Direct radiation measurements attributable to Station operations, based on control and indicator locations, were indistinguishable above background levels. Two monitoring badge locations, placed in an area near the effluents discharge stream are being used to evaluate the higher than average soil activity. This activity is a result of historic monitored liquid effluent releases during Station operation. One monitoring badge location in this area is indicating dose higher than the indicator average. The dose at this location does not exceed the regulatory limits of 10 CFR Part 20. Onsite Luxel badge locations near the ISFSI access road show higher readings, attributed to the ISFSI, and are within design calculations.

Isotopic identifications were consistent with known releases of radioactive material from the Station to the atmospheric and aquatic environments. As expected, fish and sediment samples obtained from the environment of the No Name and Clay Creeks contributed the majority of positive isotopic identifications. Cesium-137 and Cobalt-60 are the predominant nuclides identified in the aquatic environment.

II. LAND USE CENSUS

The 2006 Land Use Census was conducted in accordance with the Rancho Seco Quality Manual [RS02] Section 1.4.3.2 and the Radiological Environmental Monitoring Program (REMP) manual section 4.0. This evaluation is in accordance with the requirements of 10 CFR Part 50, Appendix I, section IV.B.3. The land use census is performed on a biennial schedule and was performed during 2005/ 2006 and then completed in 2007. See Appendix A for results from this Land Use Census. The next land use census is scheduled to be conducted during 2007/ 2008 and completed in 2009.

III. RADIOLOGICAL IMPACT EVALUATION

PREDICTED POTENTIAL RADIOLOGICAL IMPACT

Gaseous Effluent Exposure Pathways

The maximum calculated annual organ dose due to gaseous releases of tritium and particulate isotopes was 1.10 E -03 mRem (as calculated using the Rancho Seco Offsite Dose Calculation Manual (ODCM)). This calculated organ dose was 7.36 E -03% of the associated Rancho Seco Quality Manual (RSQM) [RS02] limit (10CFR50, Appendix I guideline).

Noble gases were not released in 2006 and therefore no dose calculations for noble gases were necessary.

Liquid Effluent Exposure Pathways

During 2006, 4.28 E+06 liters of wastewater were released into "No Name" Creek from the two-onsite Retention Basins. This volume of wastewater was dispersed into 1.95 E+10 liters of dilution water. The estimated error associated with determining these volumes were 5% and 20%, respectively.

The Liquid source term resulted in a calculated annual adult total body dose of 8.03 E -03 mRem and a calculated child bone dose of 2.28 E -02 mRem (as calculated using the ODCM). These calculated doses were 0.268% and 0.228%, respectively, of the associated 10 CFR Part 50, Appendix I guidelines. The quarterly doses reflect the age group(s) that could have received the highest annual dose from the liquid source term.

This information is summarized in Table 1.

III. RADIOLOGICAL IMPACT EVALUATION (Continued)

FUEL CYCLE DOSE EVALUATION

REMP Manual section 8.14 requires each Annual Radiological Environmental Operating Report (AREOR) to include information related to REMP manual section 5.0; Fuel Cycle Dose. The Fuel Cycle Dose Specification limits the dose or dose commitment to any real member of the public to 25 mRem to the total body or any organ, except the thyroid which is limited to 75 mRem. This specification implements requirements promulgated by the United States Environmental Protection Agency [CFRd].

Consistent with REMP manual section 5.0, no fuel cycle dose evaluation was required to be performed during 2006 since no REMP measurement exceeded the established reporting levels. Additionally, the Station effluent dose predictions did not exceed twice the dose guidelines of 10 CFR Part 50, Appendix I [CFRc]. The station operated within the Appendix I guidelines envelope for radioactive effluents (a condition supported by Program measurements); therefore, determination of an actual dose commitment delivered to a real member of the public was not required.

OBSERVED POTENTIAL RADIOLOGICAL IMPACT

Gaseous Effluent Exposure Pathways

The calculated gaseous effluent dose of 1.10 E -03 mRem [RS01] is based on tritium and particulate activity. The observed dose calculation, if completed, using the gross beta data (which is primarily due to naturally occurring radioisotopes) would not provide an accurate correlation with the predicted tritium and particulate activity dose calculations. Also, none of the REMP quarterly air filter composite gamma isotopic analysis results for the airborne pathway indicated the presence of nuclides of Station origin. Therefore, no dose comparison was completed.

Direct Radiation Exposure Pathway

Based on Luxel control and indicator locations measurement results obtained during 2006, the Station proper did not contribute an observable component to the recorded direct gamma radiation field. This Luxel data supports the Gaseous Effluent Exposure Pathway conclusions and supports the conclusion that the Plant has no direct radiation effect on the environment.

Luxel monitoring badges placed near the effluent stream was used to evaluate the dose from this area. Dose levels at these locations are higher than the mean of the control and indicator locations reported. This above average dose is due to elevated soil activity due to historic liquid effluent releases. Luxel badge locations around the ISFSI outside fence (required by the ISFSI License) show higher readings, attributed to the fuel stored in the ISFSI, and are within design calculations.

III. RADIOLOGICAL IMPACT EVALUATION (Continued)

OBSERVED POTENTIAL RADIOLOGICAL IMPACT

Liquid Effluent Exposure Pathways

To evaluate the impact on the environment from the liquid effluent pathway, dose calculations were performed and compared with the annual dose commitment calculations reported in the January -December 2006 Rancho Seco Annual Radioactive Effluent Release Report [RS01]. The observed results presented in Table 1 were obtained using the Cs-137 activity reported for the fish and garden samples from 2006 (Appendix F, Table F-5 and Table F-3), default consumption quantities for fish and garden (ODCM), and nuclide-specific dose factors [NRC77].

As in past reports, the observed potential dose commitments listed in Table 1 are subject to uncertainty, principally due to the assumption that the observed radioactivity was due to 2006 Station operations only and was not affected by radioactivity introduced into the environment prior to 2006. A major portion of the activity identified by Program measurements in 2006 is attributable to historical releases documented in previous annual reports. Additionally, the observed dose commitment calculations are based on conservative default consumption factors for fish and garden.

The 2006 Land Use Census indicates the liquid/ fish and liquid/ irrigated vegetation pathways are potential exposure pathways. The fish and vegetation pathway dose commitment calculation uses conservative default fish and vegetation consumption factors instead of using actual Land Use Census data. Also, the dose commitment calculation uses fish sample analysis data derived from fish samples collected from the plant effluent stream and from two positive vegetation samples analysis that occurred in 2006 from the Site Boundary irrigated garden.

III. RADIOLOGICAL IMPACT EVALUATION (Continued)

OBSERVED POTENTIAL RADIOLOGICAL IMPACT

TABLE 1

2006 Liquid Effluent Pathway Potential Dose Comparison

POTENTIAL DOSE COMMITMENT
(Based on the maximally exposed group)

PREDICTED DOSE COMMITMENT (a) (mRem)	OBSERVED DOSE COMMITMENT (b) (c) (mRem)	PERCENT OF THE 10 CFR PART 50 APPENDIX I DOSE LIMITS
0.00803 (Adult total body for 1st and 2nd quarter)	0.092 (Adult Total Body)	3.07 % Total Body (3 mRem guideline)
0.0228 (Child bone for 1st and 2nd quarter)	0.146 (Child Bone)	1.46 % Organ (10 mRem guideline)

Notes:

(a) Reported in the 2006 Annual Radiological Effluent Release Report (ARERR)

(b) Calculated using Cs-137 activity for fish and garden samples (Appendix F, Table F-5 and Table F-3), consumption factors form the ODCM, and Regulatory Guide 1.109 dose conversion factors.

(c) The observed dose commitments for doses reflect the age group that could have received the highest annual dose commitment from the liquid source term

IV. PROGRAM ANALYSIS RESULTS SUMMARY

This section compiles Program data with corresponding evaluations. Each of the following five subsections presents information about each of the principal environmental exposure pathways monitored by the Program:

⇒ **Atmospheric** (Section IV-A)

⇒ **Direct Radiation** (Section IV-B)

⇒ **Terrestrial** (Section IV-C)

⇒ **Aquatic Life** (Section IV-D)

⇒ **Water** (Section IV-E)

Each of these sections contains a data evaluation subsection, which provides a summary of the data collected.

Table 2 is a comprehensive, all-media data summary presented in a format considered acceptable by the US Nuclear Regulatory Commission. Information contained in Table 2 was derived from data presented in Appendix F.

IV-A. ATMOSPHERIC MONITORING

DATA EVALUATION

No radionuclides attributable to the operation of Rancho Seco were observed in gamma spectrometry analyses of the quarterly composites of the particulate filters.

Therefore, since all data was reported as being below the associated minimum detectable activity (MDA) for the nuclides of interest, no table is presented for the composite air filter data. The data indicates that there was no measurable contribution to the airborne radioactivity inventory that could reasonably be attributable to Station operations.

The results of the gross beta analyses of the particulate samples are given in Appendix F, Table **F-1**.

IV-B. DIRECT RADIATION MONITORING

DATA EVALUATION

A comparison review of all Luxel data for the indicator and control locations during 2006 showed that there was no observable direct radiation component due to Station operations (i.e., storage or utilization of licensed radioactive material within the restricted area.)

Two Luxel locations are being used to evaluate the dose in areas next to the effluent stream. The data from these locations indicates doses are within regulatory limits of 10 CFR Part 20.

Luxel badge locations on the outside fence of the ISFSI show higher readings, but this is expected due to the spent fuel storage in the ISFSI. The results are within the design criteria and no license or regulatory limits were exceeded.

The summary data for 2006 direct radiation monitoring is presented in Table 2. Comprehensive data tables are given in Appendix F, Table F-2.

IV-C. TERRESTRIAL MONITORING

DATA EVALUATION

Garden Vegetation – Seven (7) garden vegetation samples were collected and analyzed for nuclides of interest during 2006. Gamma spectrometry analysis of these samples indicated the presence of Cs-137 (2 samples, 3.51 and 6.06 pCi/kg, 4.79 pCi/kg mean). A site boundary irrigated garden has been utilized as a conservative method for evaluating the liquid effluent pathway. This method meets the requirement of the Land Use Census for monitoring gardens.

The summary data for 2006 terrestrial monitoring is presented in Table 2. Comprehensive data tables are given in the following Appendix F table:

⇒ **F-3** (Garden Vegetables)

IV-D. AQUATIC LIFE MONITORING

DATA EVALUATION

Sediment – Twelve (12) samples of sediment were collected from the onsite discharge canal during 2006. Gamma spectrometry analysis of these samples indicated the presence of Cs-137 (12 samples, 38.9 to 742 pCi/kg, 228.1 pCi/kg mean), and Co-60 (11 samples, 9.76 to 60.7 pCi/kg, 26.7 pCi/kg mean).

The presence of nuclides of interest in sediments is attributed to historical permitted liquid effluent discharges.

Fish – Four (4) fish samples were collected during 2006 and analyzed for nuclides of interest by gamma spectrometry. Samples were collected in the effluent creek. Gamma spectrometry analysis of these samples indicated the presence of Cs-137 (3 samples, 13.8 pCi/kg to 51.4 pCi/kg, 35.4 pCi/kg mean).

The summary data for the aquatic life-monitoring program is shown in Table 2. Comprehensive data tables are given in the following Appendix F Tables:

- ⇒ **F-4** Sediment
- ⇒ **F-5** Fish

IV-E. WATER MONITORING

DATA EVALUATION

Well Water – Eight (8) well water samples were collected at indicator and control locations around the site during 2006. Tritium and gamma spectrometry analysis of the samples indicated results less than LLD. Gross beta activity levels for all samples were within regulatory limits.

Runoff Water – Thirty (30) runoff water samples were collected at the site boundary during 2006. Tritium and gamma spectrometry analysis of the samples indicated results less than LLD.

Surface Water - Five locations (3 indicator and 2 control) were included in the surface water-monitoring program. Composite samplers located at the Plant Intake (Folsom South Canal) and Effluent Discharge provides monthly composite samples. During 2006, 64 samples were collected and analyzed for nuclides of interest. Tritium and gamma spectrometry analysis of the samples indicated results less than LLD

IV-E. WATER MONITORING

DATA EVALUATION (continued)

Drinking Water - Water supplied from two site wells is distributed in a potable water supply system for Station personnel consumption and use. On a monthly frequency, samples were collected and analyzed for nuclides of interest. A sample from the Rancho Seco Reservoir Well is collected as a control location. No gamma emitting isotopes were found present in the 36 samples collected in 2006. Gross Beta analysis showed activity within regulatory limits.

The summary data for the water-monitoring program is shown in Table 2. Comprehensive data tables are given in the following Appendix F Tables:

- ⇒ **F-4** Sediment
- ⇒ **F-6** Well Water
- ⇒ **F-7** Runoff Water
- ⇒ **F-8** Surface Water
- ⇒ **F-9** Drinking Water

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

(NRC Format)

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility **Rancho Seco Nuclear Station** Docket No. **DPR-54/ SNM 2510**

Location of Facility **Sacramento, California** (County, State). Reporting Period **January - December 2006**

Medium or Pathway Sampled (Unit of Measurement)	**Type and Total Number of Analysis Performed**	**Lower Limit of Detection (LLD)[b]**	**All Indicator Locations Mean (f)[a] Range**	**Location with Highest Annual Mean Name / Distance & Direction**	**Mean (f)[a] Range**	**Control locations Mean (f)[a] Range**	**Number of Nonroutine Reported Measurements**
Air Particulates (pCi/M^3)	Gross β (153)	0.01	0.020 (104/104) (0.007- 0.041)	RAS0.1CO 0.1 miles 45°	0.021 (52/52) (0.007-0.041)	0.020 (52/52) (0.007-0.040)	0
	γ-spec (12)						
	^{137}Cs	0.01	<LLD	<LLD		<LLD	
	^{134}Cs	0.01	<LLD	<LLD		<LLD	
Direct Radiation (mRem/qtr.)	Luxel (132)	NA	18.9 (116-116) (13-32)	RTL0.4NO 0.4 miles 270°	30.2 (4/4) (29-32)	18.2 (15/15) (14-22)	0
Garden Vegetables (pCi/kg)	γ-spec (5)						
	^{60}Co	60	<LLD	<LLD		<LLD	0
	^{137}Cs	60	4.79 (2/5) (3.51 – 6.06)	RLV0.6MO 0.6 miles 248°	4.79 (2/5) (3.51 – 6.06)	<LLD	0
	^{134}Cs	60	<LLD	<LLD		<LLD	0

[a] Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

[b] LLD values from Table E-2. See page E-8, "SENSITIVITY OF THE REMP MEASUREMENT PROCESS", for information on determining LLD and Minimum Detectable Activity (MDA).

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility **Rancho Seco Nuclear Station** Docket No. **DPR-54/ SNM 2510**

Location of Facility **Sacramento, California** (County, State). Reporting Period **January - December 2006**

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analysis Performed	Lower Limit of Detection (LLD) [b]	All Indicator Locations Mean (f) [a] Range	Location with Highest Annual Mean Name / Distance & Direction / Mean (f) [a] / Range	Control locations Mean (f) [a] Range	Number of Nonroutine Reported Measurements
Sediment (pCi/kg)	γ-spec (12)					
	^{60}Co	150	26.7 (11/12) (9.76-60.7)	RMS0.6MO 0.6 miles 248° 32.7 (7/8) (12.3-60.7)	NA	0
	^{137}Cs	150	228.1 (12/12) (38.9-742)	RMS0.6MO 0.6 miles 248° 169 (8/8) (112-742)	NA	0
	^{134}Cs	150	<LLD	<LLD	NA	0
Fish (pCi/kg)	γ-spec (3)					
	^{54}Mn	130	<LLD	<LLD	NA	0
	^{60}Co	130	<LLD	<LLD	NA	0
	^{65}Zn	260	<LLD	<LLD	NA	0
	^{137}Cs	130	35.4 (3/4) (13.8 – 51.4)	RFS0.7NO 0.7 miles 270° 51.4 (1/1) (51.4)	NA	0
	^{134}Cs	130	<LLD	<LLD	NA	0

[a] Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

[b] LLD values from Table E-2. See page E-8, "SENSITIVITY OF THE REMP MEASUREMENT PROCESS", for information on determining LLD and Minimum Detectable Activity (MDA).

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility **Rancho Seco Nuclear Station** Docket No. **DPR-54/ SNM 2510**

Location of Facility **Sacramento, California** (County, State). Reporting Period **January - December 2006**

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analysis Performed	Lower Limit of Detection (LLD) [b]	All Indicator Locations Mean (f) [a] Range	Location with Highest Annual Mean Name / Distance & Direction / Mean (f) [a] / Range	Control locations Mean (f) [a] Range	Number of Nonroutine Reported Measurements
Well Water (pCi/L)	Gross β (8)	4	3.59 (4/4) (3.15-3.97)	RWW0.8DO 0.8 miles 67.5° 3.59 (4/4) (3.15-3.97)	3.42 (3/4) (2.68-3.86)	0
	Tritium (8)	1000	<LLD	<LLD	<LLD	0
	γ-spec (8)					
	^{54}Mn	15	<LLD	<LLD	<LLD	0
	^{60}Co	15	<LLD	<LLD	<LLD	0
	^{65}Zn	30	<LLD	<LLD	<LLD	0
	^{137}Cs	10	<LLD	<LLD	<LLD	0
	^{134}Cs	10	<LLD	<LLD	<LLD	0
Runoff Water (pCi/L)	Tritium (30)	2000	<LLD	<LLD	NA	0
	γ-spec (30)					
	^{54}Mn	15	<LLD	<LLD	NA	0
	^{60}Co	15	<LLD	<LLD	NA	0
	^{65}Zn	30	<LLD	<LLD	NA	0
	^{137}Cs	18	<LLD	<LLD	NA	0
	^{134}Cs	15	<LLD	<LLD	NA	0

[a] Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

[b] LLD values from Table E-2. See page E-8, "SENSITIVITY OF THE REMP MEASUREMENT PROCESS", for information on determining LLD and Minimum Detectable Activity (MDA).

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility **Rancho Seco Nuclear Station** Docket No. **DPR-54/ SNM 2510**

Location of Facility **Sacramento, California** (County, State). Reporting Period **January - December 2006**

Medium or Pathway Sampled (Unit of Measurement)	**Type and Total Number of Analysis Performed**	**Lower Limit of Detection (LLD) [b]**	**All Indicator Locations Mean (f) [a] Range**	**Location with Highest Annual Mean Name / Distance & Direction / Mean (f) [a] / Range**	**Control locations Mean (f) [a] Range**	**Number of Nonroutine Reported Measurements**
Surface Water (pCi/L)	Tritium (64)	2000	<LLD	<LLD	<LLD	0
	γ-spec (64)					
	^{54}Mn	15	<LLD	<LLD	<LLD	0
	^{60}Co	15	<LLD	<LLD	<LLD	0
	^{65}Zn	30	<LLD	<LLD	<LLD	0
	^{137}Cs	18	<LLD	<LLD	<LLD	0
	^{134}Cs	15	<LLD	<LLD	<LLD	0
Drinking Water (pCi/L)	Gross β (36)	4	3.79 (23/24) (2.35-4.95)	RDW0.1GO 0.1 miles 135° 3.93 (12/12) (2.93-4.95)	3.50 (11/12) (2.72-4.83)	0
	Tritium (36)	1000	<LLD	<LLD	<LLD	0
	γ-spec (36)					
	^{54}Mn	15	<LLD	<LLD	<LLD	0
	^{60}Co	15	<LLD	<LLD	<LLD	0
	^{65}Zn	30	<LLD	<LLD	<LLD	0
	^{137}Cs	10	<LLD	<LLD	<LLD	0
	^{134}Cs	10	<LLD	<LLD	<LLD	0

[a] Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

[b] LLD values from Table E-2. See page E-8, "SENSITIVITY OF THE REMP MEASUREMENT PROCESS", for information on determining LLD and Minimum Detectable Activity (MDA).

V. REFERENCES

CFRa — Code of Federal Regulations, 2006, "National Primary Drinking Water Regulations," Title 40, Part 141.

CFRb — Code of Federal Regulations, 2006, "Standards for Protection Against Radiation," Title 10, Part 20.

CFRc — Code of Federal Regulations, 2006, "Domestic Licensing of Production and Utilization Facilities," Title 10, Part 50.

CFRd — Code of Federal Regulations, 2006, "Environmental Radiation Protection Standards for Nuclear Power Operations," Title 40, Part 190.

CFRe — Code of Federal Regulations, 2006, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High Level Radioactive Waste, and Reactor-Related Greater than Class C Waste," Title 10, Part 72.

NRC74 — United States Nuclear Regulatory Commission, 1974, "Permanently Defueled Technical Specifications for the Rancho Seco Nuclear Station," Appendix A to Facility License No. DPR-54 (as amended).

NRC 00 — United States Nuclear Regulatory Commission, 2000, Rancho Seco Nuclear Generating Station, "License for Independent Storage of Spent Nuclear Fuel and High Level Radioactive Waste," SNM-2510. (as amended)

NRC77 — United States Nuclear Regulatory Commission, 1977, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Regulatory Guide 1.109, Revision 1.

NRC79a — United States Nuclear Regulatory Commission, 1979, "An Acceptable Radiological Environmental Monitoring Program," Branch Technical Position, Revision 1.

NRC79b — United States Nuclear Regulatory Commission, 1979, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment," Regulatory Guide 4.15, Revision 1.

NRC92 — United States Nuclear Regulatory Commission, "Air Sampling in the Workplace", Regulatory Guide 8.25, June 1992

NUREG79 — United States Nuclear Regulatory Commission, 1979, "Radiological Effluent Technical Specifications for PWRs," NUREG-0472, Revision 2.

V. REFERENCES (continued)

NUREG80a	United States Nuclear Regulatory Commission, 1980, "Methods for Demonstrating LWR Compliance with the EPA Uranium Fuel Cycle Standard (40 CFR Part 190)," NUREG-0543.
RS01	Rancho Seco Nuclear Station, 2006, "Annual Radioactive Effluent Release Report, January -December 2006," Sacramento Municipal Utility District report.
RS02	Rancho Seco Quality Control Manual, Appendix A

VI. APPENDICES

APPENDIX A

2005/2006 LAND USE CENSUS RESULTS

In compliance with the Rancho Seco Quality Manual [RS02] and the REMP Manual, section 4.0, "Land Use Census", a land use census was completed in March 2007. The method of conducting the primary survey was to use an aerial survey that was conducted during June 2006. Evaluating the aerial photographs continues to provide an accurate method of determining locations and distances of the nearest residences. The aerial photos also provided a method to identify any changes in the agricultural, commercial, residential, or industrial use of the land surrounding the site. The use of conservative dose factors for the purpose of projected dose calculations still requires that we evaluate the use of the area surrounding the site. The information that is presented is to verify this assumption and validate the process.

The land use census covered an area bounded by each of the sixteen meteorological sectors out to a two-mile radius from the Reactor Building.

The 2005/ 2006 Land Use Census did not identify any changes in the use of the unrestricted areas that would require modifications in the Radiological Environmental Monitoring Program for evaluating doses to individuals from principal pathways of exposure. This evaluation and determination are in accordance with the requirements of 10 CFR Part 50, Appendix I, section IV.B.3.

The Land Use Census is completed on a biennial schedule. Aerial surveys will be conducted during 2008 and the Galt Irrigation report covering 2007 and 2008 will be requested during the last quarter of 2007 and 2008 (respectively). This information will be used to complete the 2007/ 2008 census, which is scheduled to be completed during the first quarter of 2009.

A. RESIDENT EXPOSURE PATHWAY SUMMARY

Inhalation, Ground Plane and Water Consumption

The 2005/ 2006 census determined that seven of the 16 radial sectors have residences that are within the 2-mile (3219 meters) Land Use Census radius. The closest residence in each of the seven sectors is identified below:

Sector	Distance (meters)	Ranking (Nearest to Farthest)
A	>3219	NA
B	>3219	NA
C	1432	3
D	1175	1
E	>3219	NA
F	>3219	NA
G	2381	6
H	>3219	NA
J	>3219	NA
K	2320	5
L	1207	2
M	2028	4
N	3181	7
P	>3219	NA
Q	>3219	NA
R	>3219	NA

It is expected that all seven residences use well water for consumption and other domestic purposes.

B. DEPOSITION EXPOSURE PATHWAY SUMMARY

Beef Consumption

Based on conservative dose calculation parameters in use, the following is a summary for the 2003/ 2004 land use census of the potential deposition exposure pathways at the locations listed below:

Sector	Distance (meters)	Consumption Pathway	Comment
A	433	Beef	Unrestricted Area Boundary
B	430	Beef	Unrestricted Area Boundary
C	531	Beef	Unrestricted Area Boundary
D	451	Beef	Unrestricted Area Boundary
E	483	Beef	Unrestricted Area Boundary
F	499	Beef	Unrestricted Area Boundary
G	579	Beef	Unrestricted Area Boundary
H	198	Beef	Unrestricted Area Boundary
J	195	Beef	Unrestricted Area Boundary
K	195	Beef	Unrestricted Area Boundary
L	286	Beef	Unrestricted Area Boundary
M	404	Beef	Unrestricted Area Boundary
N	514	Beef	Unrestricted Area Boundary
P	708	Beef	Unrestricted Area Boundary
Q	579	Beef	Unrestricted Area Boundary
R	448	Beef	Unrestricted Area Boundary

Due to the revision of the ODCM, which eliminated the gaseous effluent pathway (August 26, 2002), the Deposition Exposure Pathway is not considered a credible evaluation with current plant conditions. Land Use Census use of this evaluation will be considered for revision in future surveillances.

C. IRRIGATED CROP EXPOSURE PATHWAY SUMMARY

Laguna Creek

Galt Irrigation District

The Galt Irrigation District's 2005 Crop Report stated 2470.179 acre-feet of Laguna Creek water was diverted for irrigation purposes during the 2005 crop production season. Crops irrigated were Oats, Corn, Clover, Pasture, Sudan, and Alfalfa over a total of 1021 acres.

The Galt Irrigation District's 2006 Crop Report stated 2438.851 acre-feet of Laguna Creek water was diverted for irrigation purposes during the 2006 crop production season. Crops irrigated were Corn, Clover, Pasture, Sudan, Ryegrass, and Alfalfa over a total of 1190 acres.

Rossini Farming Company

In addition to the above, SMUD has contracted with Rossini Farming Co., the owners of the vineyards adjacent to Rancho Seco Station, to supply irrigation water from Clay Creek on an as needed basis.

The following information was reported by the SMUD Water and Power Group, which is responsible for monitoring the usage. For the years of 2005 and 2006 it was reported that >500 Acre-feet of water was used from the effluent creek for irrigating purposes for the vineyards.

D. OTHER EXPOSURE PATHWAYS

The 2005/2006 Land Use Census confirmed previous knowledge that the Clay/ Laguna Creeks are utilized by the general public for aquatic life consumption purposes. Based on direct observation cattle consume water from the Clay, Hadselville, and Laguna Creeks.

Past census evaluations have been unsuccessful in determining the usage/ occupancy factors for this consumption. Therefore, insufficient data existed to justify ODCM usage factor modification.

E. REMP EVALUATION

An objective of the 2005/ 2006 Land Use Census was to compare census and current REMP Manual locations to ensure consistency exists between monitoring activities and actual land utilization. The following discussion is a summary of the comparison evaluation for each of the four exposure pathways.

Resident Exposure Pathway

Luxel dosimetry and air particulate sampling and analysis monitor the inhalation and ground plane exposure pathways, the principal components of the Resident Exposure Pathway, directly and indirectly. Well water was monitored at two locations.

Since the existing REMP was more conservative with respect to Resident Exposure Pathway monitoring, no changes were required.

Deposition Exposure Pathway

The Deposition Exposure Pathway is monitored directly within the Station Site Boundary through garden vegetation sampling and analysis. The potential for a deposition pathway has been evaluated by the ODCM and REMP programs and found to have little potential for the current plant status. Since the current REMP was representative and conservative with respect to Deposition Exposure Pathway monitoring, no changes were required.

Irrigated Crop Exposure Pathway

The REMP was effective in monitoring the identified irrigated crop exposure pathways. This conclusion was because the REMP included irrigated vegetation sampling.

REMP surface water surveillance activities monitor irrigation water radiological quality. Current ODCM calculations are conservative since dilution effects are not included when predicting potential dose delivered through downstream pathways.

E. REMP EVALUATION (continued)

Other Exposure Pathways

Existing aquatic life, surface water and sediment sampling analysis practices are effective in monitoring potential observable effects associated with recreational activities occurring at the Clay Creek, Hadselville Creek, Laguna Creek, Folsom South Canal and Rancho Seco Lake. With respect to availability and quantity of food sources, the other identified consumption activities were considered inconsequential for pathway monitoring purposes.

No REMP changes were required to monitor other exposure pathways.

F. ODCM EVALUATION

Based on 2005/2006 Land Use Census findings, the following potential exposure pathways exist at the indicated locations:

LIQUID EFFLUENT

Exposure Pathway	Location	Comment
Freshwater Fish	Clay Creek	Recreation beyond the Site Boundary
Swimming	Clay Creek	Recreation beyond the Site Boundary
Shoreline Deposits	Clay Creek	Recreation beyond the Site Boundary
Irrigated vegetation	Clay Creek	Commercial vineyards and potential residences beyond the site boundary
Irrigated forage	Clay Creek	Cattle grazing beyond the Site Boundary
Drinking Water	Clay Creek	Cattle drinking water beyond the Site Boundary

F. ODCM EVALUATION (continued)

Specifying the Laguna Creek location also provides additional conservatism since the beneficial effects of downstream dilution are not considered when specifying effluent release restrictions.

As required by the 2005/ 2006 Land Use Census the above information for exposure pathways and locations was submitted for incorporation in the ODCM.

APPENDIX B

SAMPLE SITE DESCRIPTIONS AND MAPS

This appendix provides descriptive information about the sampling locations and maps of all the locations for the Radiological Environmental Monitoring Program sites.

Table B-1 provides information on sample type, identification codes, and map location references. The sample identification code is an alphanumeric string beginning with the prefix "R" (for Rancho Seco Nuclear Station) followed by two letters to identify the sample media:

AS	Air	MS	Mud and Silt
RW	Runoff Water	FS	Fish
SW	Surface Water	LV	Garden Vegetable
DW	Drinking Water	TL	Direct Gamma Radiation (Luxel)
WW	Well Water		

The numeric designations, which follow the letter designations, indicate the straight-line distance (in miles) from the center of the Reactor Building to the monitoring site.

The next letter designates the sector in which the monitoring location is located. The letters A through R are used for sector designators. The letters I and O are not used to prevent confusion with the numbers one and zero in the ID codes.

Sector Letter	Degrees Azimuth	Compass Point
A	348.75 to 11.25	N
B	11.25 to 33.75	NNE
C	33.75 to 56.25	NE
D	56.25 to 78.75	ENE
E	78.75 to 101.25	E
F	101.25 to 123.75	ESE
G	123.75 to 146.25	SE
H	146.25 to 168.75	SSE
J	168.75 to 191.25	S
K	191.25 to 213.75	SSW
L	213.75 to 236.25	SW
M	236.25 to 258.75	WSW
N	258.75 to 281.25	W
P	281.25 to 303.75	WNW
Q	303.75 to 326.25	NW
R	326.25 to 348.75	NNW

SAMPLE SITE DESCRIPTIONS AND MAPS (Continued)

The final letter designation indicates if the location is part of the operational REMP program ("O") or post-operational REMP program ("P").

Table B-1 Lists each location referencing the sample type and the location ID code to the map site number on one of the four Radiological Environmental Monitoring Site Maps included in this Appendix.

Figure B-1 **Site Location Map**: Shows the locations of the sample locations on and/or near the Site (including Storm Drain locations).

Figure B-2 **1 Mile Radius map**: Sampling locations within one mile of the Reactor Building centerline are shown on this map.

Figure B-3 **5 Mile Radius map**: Sampling locations between one and five miles from the Reactor Building centerline are shown on this map.

Figure B-4 **25 Mile Radius map**: Sampling locations between five to 25 miles from the Reactor Building centerline are shown on this map.

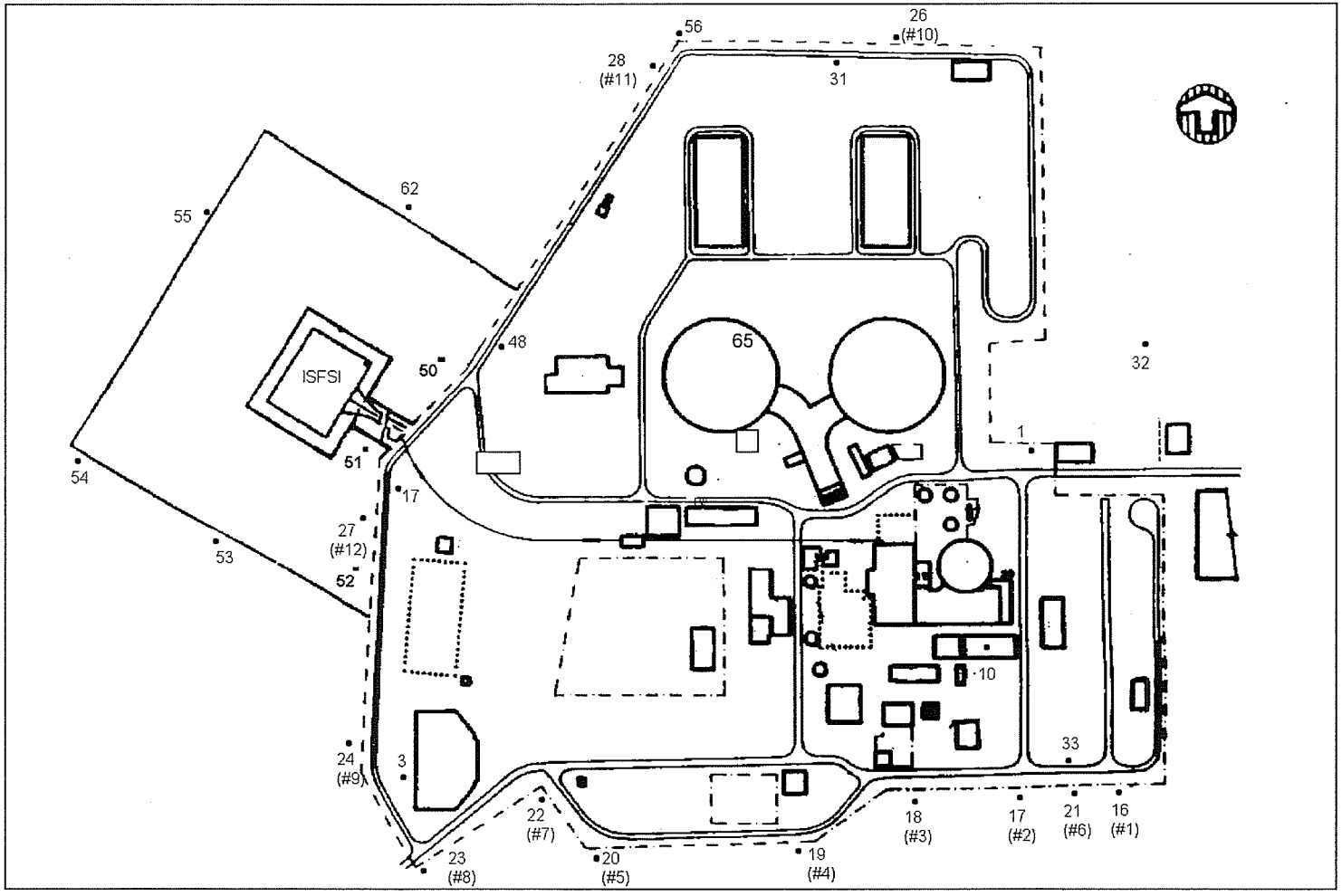

Figure B-1 Radiological Environmental Sampling Locations on and near the Site
(Storm Drain location numbers are in parenthesis)

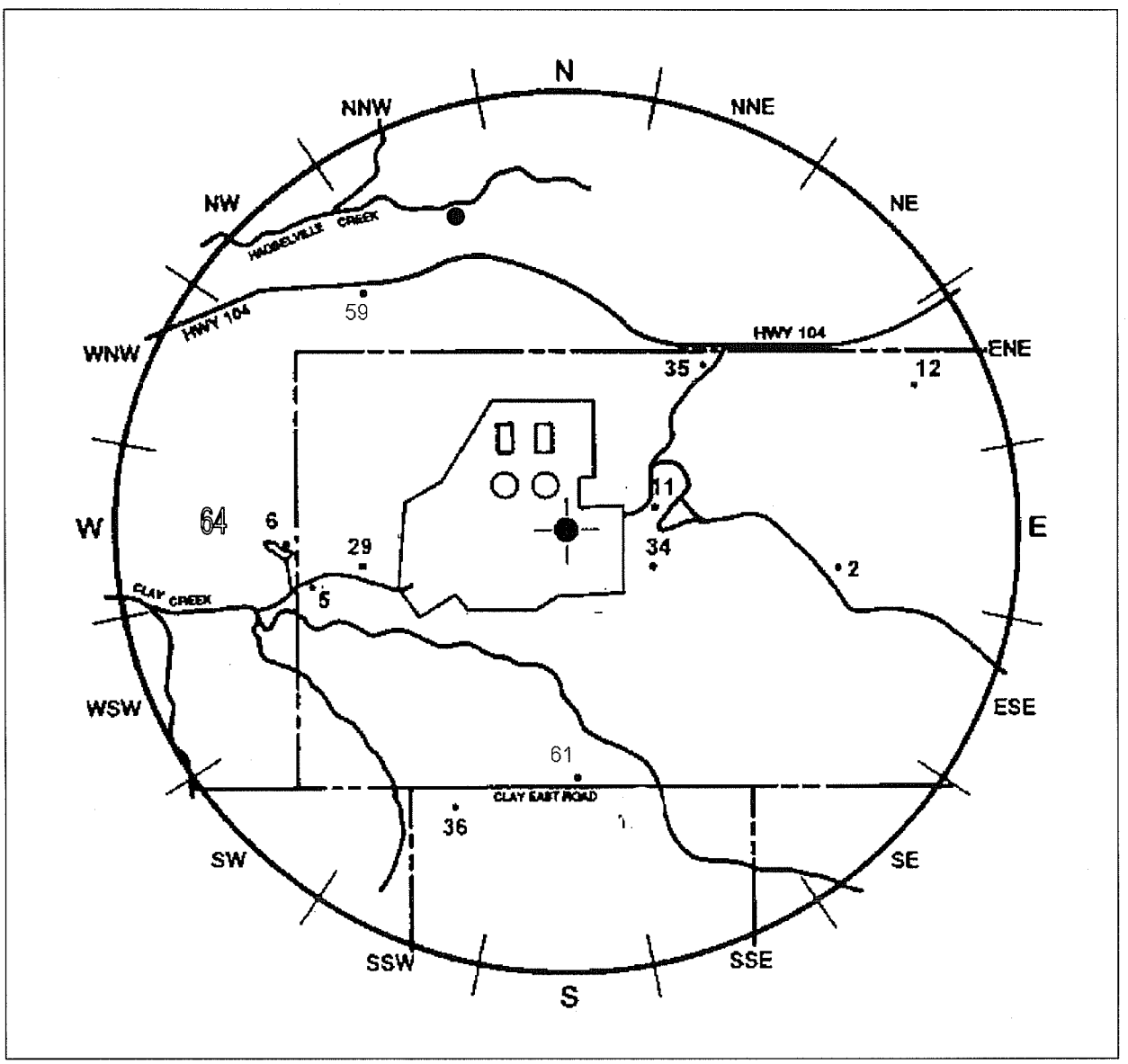

Figure B-2 Radiological Environmental Sampling Locations within 1 mile from the Reactor Building

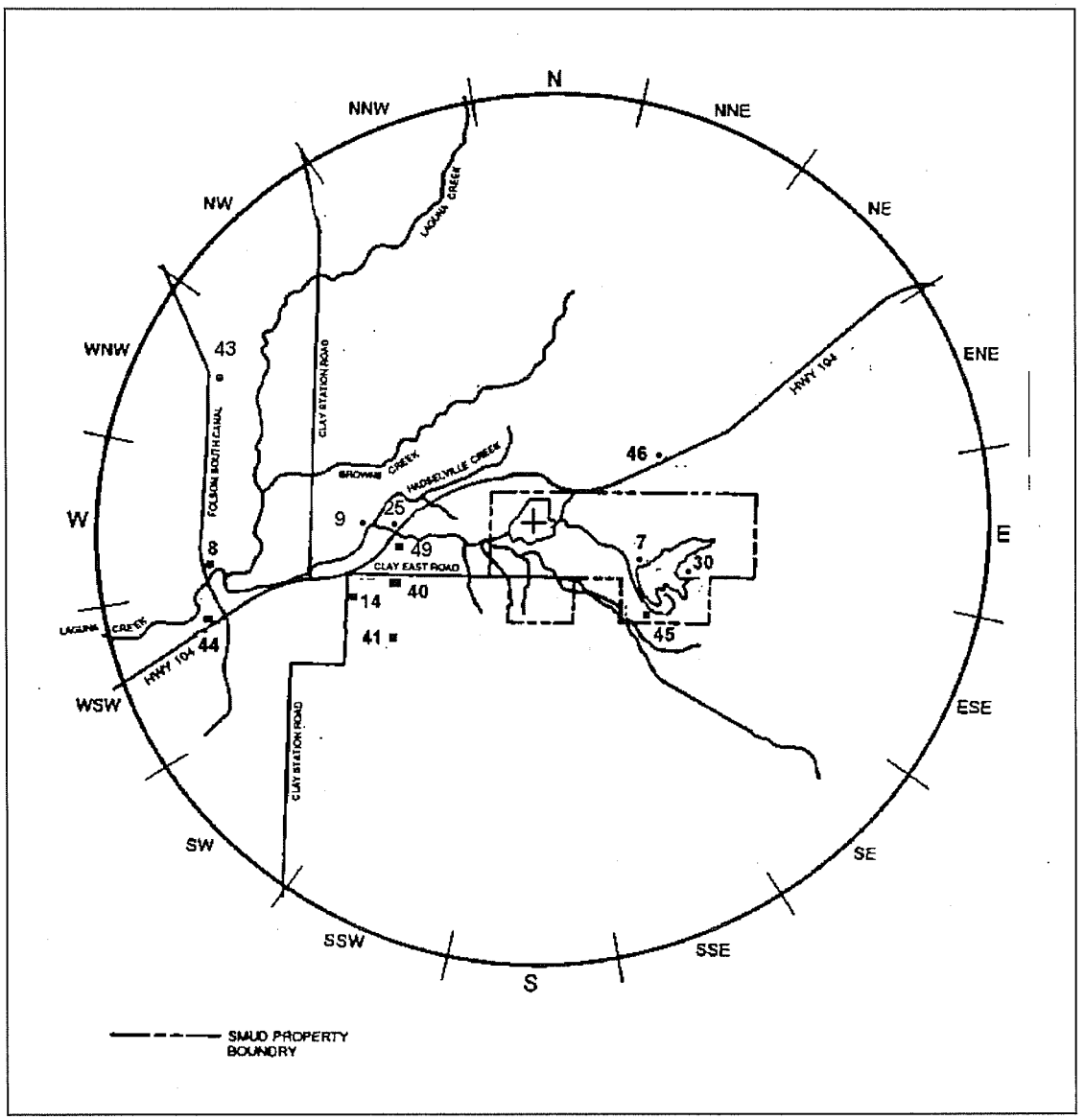

Figure B-3 Radiological Environmental Sampling Locations from 1 to 5 miles from the Reactor Building

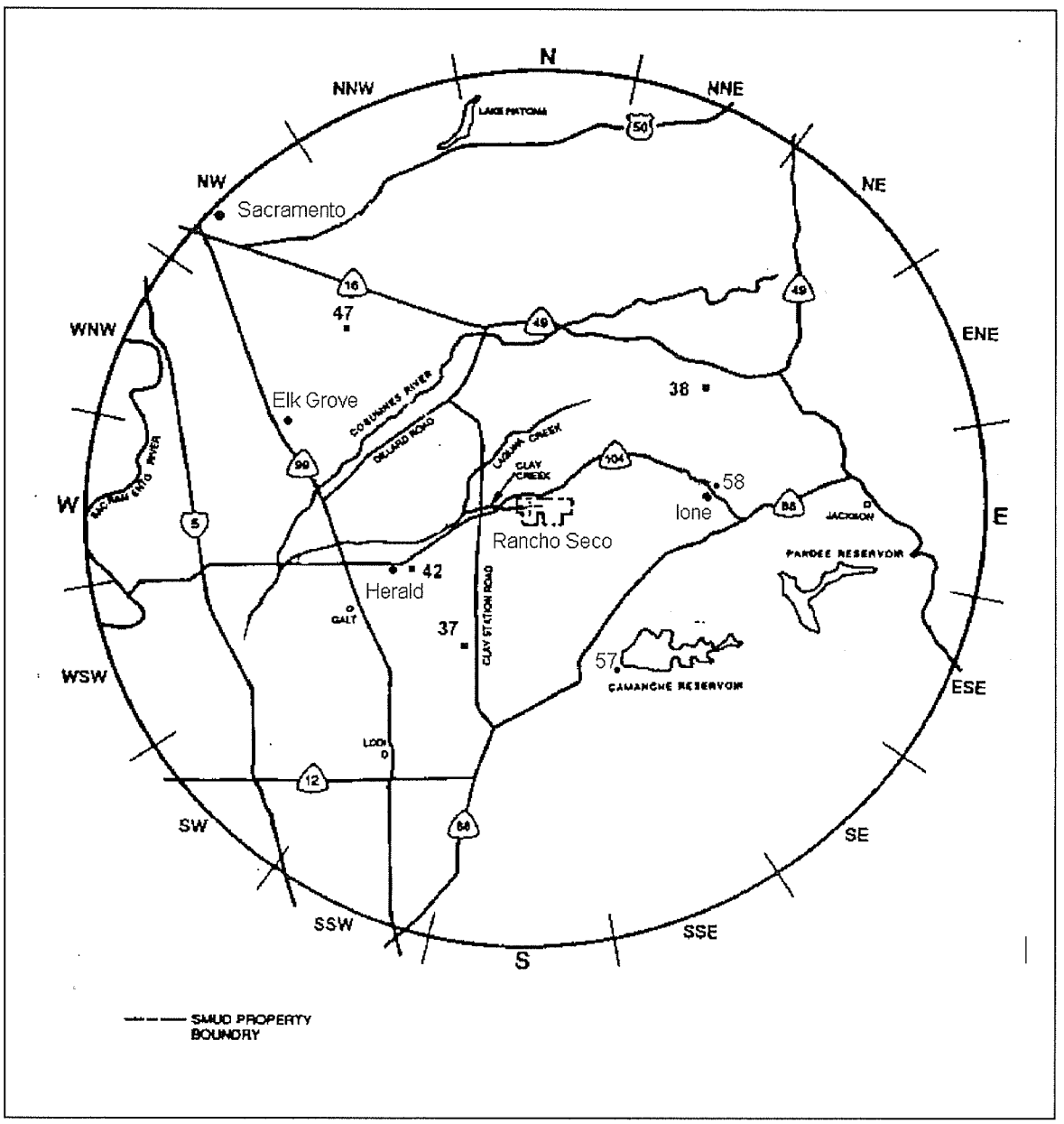

Figure B-4 Radiological Environmental Sampling Locations 5 to 25 miles from the Reactor Building

Table B-1
Radiological Environmental Monitoring Sites and Map Locations

Sample Type	ID Code	Class	Map Location No.	Collection Frequency	Description. of Location	Miles	Sector
AIR	RAS0.1CO	IND.	1	Weekly	On Site-PAP BLDG.	0.1	C
AIR	RAS0.7EO	CON	2	Weekly	Meteorological Tower	0.7	E
AIR	RAS0.3MO	IND.	3	Weekly	Effluent Discharge	0.3	M
RUNOFF WATER	RRW0.6MO	IND.	5	Biweekly	Site Boundary	0.6	M
SURFACE WATER	RSW0.7NO	IND.	6	Monthly	Water Sump	0.7	N
SURFACE WATER	RSW1.3FO	CON	7	Monthly	Rancho Seco Reservoir	1.3	F
SURFACE WATER	RSW3.7NO	CON	8	Monthly Composite	ISCO Composite Sampler at Folsom South Canal	3.7	N
SURFACE WATER	RSW0.3MO	IND.	3	Monthly Composite	ISCO Composite Sampler at Effluent Discharge	0.3	M
SURFACE WATER	RSW1.8NO	IND.	9	Monthly	Confluence of Clay and Hadselville Creeks	1.8	N
DRINKING WATER	RDW0.1GO	IND.	10	Monthly	Rancho Seco Site	0.1	G
DRINKING WATER	RDW1.8FP	CON	30	Monthly	Rancho Seco Lake Well	1.8	F
DRINKING WATER	RDW0.2PP	IND	65	Monthly	SAS Well	0.2	P
WELL WATER	RWW0.3EO	IND.	11	Quarterly	Site Well	0.3	E
WELL WATER	RWW0.8DO	CON	12	Quarterly	Marciel Ranch	0.8	D

Table B-1
(Continued)
Radiological Environmental Monitoring Sites and Map Locations

Sample Type	ID Code	Class	Map location No.	Collection Frequency	Description. of Location	Miles	Sector
MUD AND SILT	RMS0.3MO	IND.	3	Quarterly	Effluent Discharge	0.3	M
MUD AND SILT	RMS0.6MO	IND.	5	Quarterly	Site Boundary	0.6	M
FISH	RFS0.3MO	IND.	3	Semi-Annual	Effluent Discharge	0.3	M
FISH	RFS0.6MO	IND.	5	Semi-Annual	Site Boundary	0.6	M
FISH	RFS0.7NO	IND.	6	Semi-Annual	Water Sump	0.7	N
FISH	RFS1.5FO	CON	7	Semi-Annual	Rancho Seco Reservoir	1.5	F
FISH	RFS1.8NO	IND.	9	Semi-Annual	Confluence of Clay and Hadselville Creeks	1.8	N
GARDEN VEGETABLES	RLV0.6MO	IND.	5	Semi-Annual	Site Boundary Garden irrigated with No-Name Creek water	0.6	M
GARDEN VEGETABLES	RLVXX.XX	CON	NA	Semi-Annual	Truck Garden which provides local produce from the local area	NA	NA

Table B-1
(Continued)

Radiological Environmental Monitoring Sites and Map Locations

Sample Type	ID Code	Class	Map Location No.	Collection Frequency	Description of Location	Miles	Sector
LUXEL	RTL0.3RO	IND.	31	Quarterly	NNW @ Perimeter Fence N/O Spray Ponds; #1	0.3	R
LUXEL	RTL0.3C0	IND.	32	Quarterly	NE Perimeter Fence/ parking lot NE corner; #2	0.3	C
LUXEL	RTL0.3NO	IND.	17	Quarterly	W Perimeter Fence road/ pole/ top of hill; #3	0.3	N
LUXEL	RTL0.3LO	IND.	20	Quarterly	SW Perimeter Fence road near RS lake filters; #4	0.3	L
LUXEL	RTL0.3HO	IND.	33	Quarterly	Perimeter Fence/ S/O of Admin. Bldg.; #5	0.3	H
LUXEL	RTL0.4F0	IND.	34	Quarterly	Photovoltaic Facility/ North Fence (NRC); #6	0.4	F
LUXEL	RTL0.5CO	IND.	35	Quarterly	Rt. 104 entrance to Rancho Seco; #7	0.5	C
LUXEL	RTL0.6KO	IND.	36	Quarterly	Tokay Substation; #11	0.8	K
LUXEL	RTL2.7MO	IND.	14	Quarterly	In Clay at Tipling's Residence 11633 Clay Station Rd; #16 (See note below)	2.1	M
LUXEL	RTL8.2KO	CON.	37	Quarterly	Elliott Cemetery Near Angelo Dairy; #17	8.2	K
LUXEL	RTL7.8CO	CON.	38	Quarterly	Sam Jaber Residence/ 601 Carbondale Rd/ Ione; #18	7.8	C
LUXEL	RTL0.7GO	IND.	30	Quarterly	Well pump fence @ reservoir; #43	1.7	G
LUXEL	RTL1.5MO	IND.	40	Quarterly	Clay East & Kirkwood (NRC); #20	1.5	M
LUXEL	RTL3.9KO	IND.	41	Quarterly	SSW of Site on Borden Rd; #26	3.9	K
LUXEL	RTL7.4MO	CON.	42	Quarterly	Herald Fire Station #87/ 12746 Ivie Rd; #30	7.4	M

Note: Badge at map location 14 (Tippling residence # 16 was moved to power pole outside of property due to inaccessibility, on July 27, 2005.

Table B-1
(Continued)
Radiological Environmental Monitoring Sites and Map Locations

Sample Type	ID Code	Class	Map Location No.	Collection Frequency	Description of Location	Miles	Sector
LUXEL	RTL3.7NO	IND.	43	Quarterly	Folsom South Canal near Hobday Rd; #31	3.7	N
LUXEL	RTL3.8MO	IND.	44	Quarterly	BLM entrance to Folsom South Canal Pumping Station; #33	3.8	M
LUXEL	RTL1.9NO	IND.	9	Quarterly	Hadselville Cr. & Clay Cr.; #35	1.9	N
LUXEL	RTL1.8F0	IND.	45	Quarterly	Rancho Seco Lake Maintenance Building, #19	1.8	F
LUXEL	RTL1.4DO	IND.	46	Quarterly	0.9 Miles E/O Site on Twin Cities Road/ Rt. 104; #46	1.4	D
LUXEL	RTL8.0PO	CON.	47	Quarterly	Dillard School; #55	8.0	P
LUXEL	RTL0.8DO	IND.	12	Quarterly	Marciel Ranch; 14626 Twin Cities Rd; #63	0.8	D
LUXEL	RTL0.6MO	IND.	5	Quarterly	Site Boundary Irrigated Garden; #65	0.6	M
LUXEL	RTL0.4NO	IND.	29	Quarterly	Depression @ Clay Creek; #66	0.4	N
LUXEL	RTL0.4NO1	IND.	29	Quarterly	Soil Pile @ Clay Creek; #67	0.4	N
LUXEL	RTL0.3PO	IND.	48	Quarterly	West Fence; #68	0.3	P
LUXEL	RTL0.3NP	IND.	53	Quarterly	West Garden, #88	0.3	N
LUXEL	RTL0.4NP	IND.	54	Quarterly	Southwest ISFSI, #89	0.4	N
LUXEL	RTL0.5NP	IND.	55	Quarterly	Northwest ISFSI, #90	0.5	P
LUXEL	RTL0.3QP	IND.	56	Quarterly	Northeast ISFSI, #91	0.3	Q
LUXEL	RTL0.7QP	IND.	59	Quarterly	Highway 104 at the rail spur on pole, #92	0.7	Q
LUXEL	RTL0.7JP	IND.	61	Quarterly	Clay East Road on pole south of site boundary, #93	0.7	J
LUXEL	RTL0.4PP	IND.	62	Quarterly	ISFSI ALARA fence north side, #94	0.4	P

APPENDIX C

QUALITY CONTROL SAMPLE ANALYSIS RESULTS

QUALITY ASSURANCE AND CONTROL

Implementation of the Radiological Environmental Monitoring Program (REMP) consists of a number of discrete steps including:

- ⇒ Sample collection,
- ⇒ Packaging,
- ⇒ Shipment and receipt,
- ⇒ Measurements of radioactivity,
- ⇒ Data evaluation, and
- ⇒ Reporting.

These program elements are performed according to approved, written procedures to assure the validity of REMP results. This section discusses the internal quality control measurements made by the analysis laboratory, Eberline Services, and the results of their participation in the Interlaboratory Comparison Program implemented by the National Institute of Standards Testing (NIST). The Interlaboratory Comparison Program and the analysis laboratories Quality Assurance Programs provide information on the validity (accuracy and precision) of the REMP implementation steps listed above.

Because REMP measurement validity is important for evaluating protection of the health and safety of the public, RSNS has established an Environmental Quality Assurance Program (EQAP) for radiological environmental measurements. The Environmental QA Program implements the guidance provided in Regulatory Guide 4.15, (NRC79a).

INTERLABORATORY COMPARISON PROGRAM

The ICP is a radiological analysis quality control program implemented by NIST and provided by vendor laboratories. Eberline Services participates in an ICP provided by Environmental Resources Associates (ERA). Participation in an ICP is a requirement of the Rancho Seco Quality Manual (RS02), section 1.4.3.2. It provides for an independent check of the proficiency of the laboratory. It also provides information on the precision and accuracy of measurements of radioactive material in REMP samples by Eberline Services. The extent of Eberline Services participation in this program includes all of the environmental radioactivity determinations that are related to the analyses required by the REMP manual.

INTERLABORATORY COMPARISON PROGRAM (Continued)

The Intercomparison Program consists of sample media spiked with known quantities of specific radioactive materials at levels normally found in environmental samples. Most samples require long counting times to determine if any activity is present, and the results may have large deviations from the mean. When the samples are distributed, there is an implied precision requirement given in terms of the analysis requested to be performed. After the labs provide the results of their analyses, an ERA laboratory provides a statistical summary of all the results by the participating laboratory. This report includes the acceptance control limits, the mean of all laboratories and the standard deviation of the results by all labs, among other statistics.

If the results of a determination by Eberline Services in the ICP are outside the specified control limits or do not pass the outliers test, Eberline Services must investigate and, if a problem is identified, take corrective action to prevent problem recurrence.

During 2006, Eberline Services analyzed 26 ICP sample analysis related to the current REMP program. One analysis for Gross Alpha in Water resulted in a "No Evaluation" due to the fact Eberline submitted one value and two less than values. Eberline initiated a Corrective Action Report (CAR) and results of the investigation were acceptable. See Note on Table C-1.

The Eberline Services measurement results are presented in Table C-1 along with the acceptable values for each test.

INTRALABORATORY QUALITY ASSURANCE PROGRAM

Eberline Services by contract also operate an Intralaboratory Comparison Program (Quality Assurance Program) to maintain an acceptable quality level on a routine basis.

As part of their Quality Assurance Program, the laboratory performs background counts, an analysis of spiked samples, and duplicate sample counts for every ten Rancho Seco REMP samples analyzed. These quality control procedures are performed for all analyses except gamma spectrometry, for which weekly energy and efficiency checks are performed. Personnel not directly involved with the analysis prepare the spiked and duplicate samples. Spiked samples, as well as the radioactive sources used for the gamma spectrometer checks, are traceable to the National Institute for Standards and Technology (NIST).

RANCHO SECO AUDIT AND SURVEILLANCE RESULTS

The Rancho Seco Quality Program requires periodic audits of REMP activities, including Eberline Services. Contract laboratory performance is evaluated by the Rancho Seco QA Department. An audit of Eberline Services was conducted by the Rancho Seco QA department.

CONCLUSIONS

The Intralaboratory and Interlaboratory results provided by Eberline Services indicate that Eberline Services performance was acceptable.

DIRECT RADIATION (Luxel) COMPARISON PROGRAM

The monitoring badge vendor, Landauer participates in a comparison program provided by the Idaho National Environmental Laboratory (INEL). INEL did not conduct this comparison program in 2006; therefore no results from that program are available for this report. Landauer also maintains NVLAP certification with NIST. A review of Landauer's NVLAP certification results indicates that Landauer has satisfactorily completed all of the required tests for the types of environmental radiation monitored at RSNS and is certified through December 31, 2007.

This comparison program satisfies the requirement of the REMP manual section 6.0.

TABLE C-1
2006 INTERLABORATORY COMPARISON PROGRAM

Sample Type (ERA RAD-64)	Report Date	Assay Type	ERA Result (pCi/L)	Eberline Result (pCi/L)	Control Limits (pCi/L)
Water	3/24/06	Sr-89	50.2	50.0	41.5-58.9
Water	3/24/06	Sr-90	30.7	24.3	22.0-39.4
Water	3/24/06	Ba-133	95.0	82.6	78.6-111
Water	3/24/06	Cs-134	23.1	29.4	14.4-31.8
Water	3/24/06	Cs-137	111	112	101-121
Water	3/24/06	Co-60	95.3	91.0	86.6-104
Water	3/24/06	Zn-65	192	198	159-225
Water	3/24/06	Gross Alpha	9.61	9.36	0.950-18.3
Water	3/24/06	Gross Beta	61.9	65.0	44.6-79.2
Water	3/24/06	Radium-226	4.58	4.73	3.39-5.77
Water	3/24/06	Radium-228	6.60	8.74	3.74-9.46
Water	3/24/06	Uranium(Nat)	22.1	20.8	16.9-27.3
Water	3/24/06	Tritium	16700	16800	13800-19600

TABLE C-1
(cont.)
2006 INTERLABORATORY COMPARISON PROGRAM

Sample Type (ERA RAD-66)	Report Date	Assay Type	ERA Result (pCi/L)	Eberline Result (pCi/L)	Control Limits (pCi/L)
Water	9/14/06	Sr-89	19.7	24.9	11.0-28.4
Water	9/14/06	Sr-90	25.9	24.6	20.1-31.7
Water	9/14/06	Ba-133	88.1	76.3	72.9-103
Water	9/14/06	Cs-134	54.1	54.4	45.4-62.8
Water	9/14/06	Cs-137	238	238	217-259
Water	9/14/06	Co-60	99.7	100.0	91.0-108
Water	9/14/06	Zn-65	121	135	100-142
Water	9/14/06	Gross Alpha	9.96	<NA***	1.30-18.6
Water	9/14/06	Gross Beta	8.85	7.77	0.190-17.5
Water	9/14/06	Radium-226	10.7	10.9	7.92-13.5
Water	9/14/06	Radium-228	10.7	13.9	6.07-15.3
Water	9/14/06	Uranium(Nat)	40.3	39.0	33.3-47.3
Water	9/14/06	Tritium	4050	4110	3350-4750

* Result was reported as a "No Evaluation because Eberline submitted one value and two less than values. Corrective Action investigation was initiated. The Corrective Action Report indicated the incorrect sample results were submitted due to an administrative error. No additional action required.

APPENDIX D

SAMPLE COLLECTION AND ANALYSIS METHODS

For each of the sample media collected, the method of collection is documented in Rancho Seco Nuclear Station procedures. Detailed analysis methods are documented in procedures controlled by the contract laboratory, Eberline Services. A brief description of these collection and analysis methods is included in this Appendix.

Sample Media	Collection/Analysis Method
AIR	An air sampler continuously moves air through a filter paper designed to capture particulates by filter paper impaction. The air samplers are equipped with an elapsed time meter and flow gauge, which are used to calculate the volume of air that has passed through the filter paper. The filter paper is exchanged weekly. At least one day is allowed to elapse between sample collection and counting to reduce the interference of naturally occurring radon and thorium daughters on the sample analysis. The filter paper is assayed for gross beta radioactivity by placing the filter on a stainless steel planchet and counted with an internal gas flow proportional counter. The individual particulate filter papers are saved over a calendar quarter and the composite collection is assayed for gamma isotopic radioactivity by gamma spectroscopy.
DIRECT RADIATION	Monitoring badges, (Luxels), are located within a ten (10) mile radius of the site. The badges within a five (5) mile radius are considered indicator badges. Two (2) badges are placed at each monitoring location to assure adequate data recovery and to improve measurement statistics. The badge field exposure cycle is approximately ninety (90) days. At the end of the field exposure cycle, the badges are exchanged and returned to the contract laboratory for processing.

Sample Media	Collection/Analysis Method
SEDIMENT	Samples of sediment are collected from the top three inches of the sampled material. Sediment samples are obtained approximately two feet from the shoreline. Each sample is assayed directly for gamma isotopic radioactivity by gamma spectroscopy.
GARDEN PRODUCE	Samples of vegetables are collected semi-annually from a garden, which is maintained at the Station Site Boundary. Control location samples are collected from a local commercial vendor. The vegetables are assayed directly for gamma isotopic radioactivity by gamma spectroscopy.
FISH	Fish are collected semi-annually from the Clay Creek system. The dissected (edible) portion of each sample is assayed directly for gamma isotopic radioactivity by gamma spectroscopy.
WATER	1-liter grab samples of water from locations in the liquid effluent pathway and groundwater are collected as follows: • Surface water and Drinking water are collected monthly • Runoff water is collected biweekly • Well water is collected quarterly. At two locations, samples are obtained to provide a monthly composite sample. All samples are assayed for tritium by liquid scintillation counting and for gamma isotopic radioactivity by gamma spectroscopy. Drinking and Well water samples are analyzed for Gross Beta activity.

APPENDIX E

ENVIRONMENTAL MONITORING PROGRAM DESIGN

PROGRAM BASIS

The Sacramento Municipal Utility District conducts a continuous Radiological Environmental Monitoring Program (REMP) at the Rancho Seco Nuclear Station to assess the impact of Station operation on the surrounding environment. The current Post-Operational REMP is a continuation of a similar program initiated prior to and during operation of the Station. Samples of the surrounding environment are collected on a routine basis and analyzed to determine the amount of radiation and radioactive materials present in the exposure pathways.

During 2006 the program was directed and executed by the Radiation Protection/ Chemistry Superintendent. Decommissioning Chemistry/ Radiation Protection Technicians perform sample collection. The Radiological Health Supervisor performs data review and Program maintenance/ oversight. The Program is operated with primary accountability and cognizance of the Manager, Plant Closure and Decommissioning.

The Program is designed consistent with Title 10, Code of Federal Regulations, Part 50, Appendix I - Section IV, B.2, B.3 and C, and Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion 64. The program also complies with Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation," Section 1302. These federal requirements are cited in the Rancho Seco Quality Manual, Appendix A, and the REMP manual. REMP requirements are implemented through the review, approval and routine use of several documents, namely the REMP Manual, Offsite Dose Calculation Manual, Surveillance Procedures and Health Physics Implementing Procedures.

The programmatic elements of the REMP are based on regulatory requirements and associated guidelines. The objectives of the Program are to:

1. Provide the technological basis and the instruction for monitoring the environs for radioactivity sources. The radioactive sources, which contribute to detectable radioactivity in the local environs, are comprised of:

   ⇒ Naturally occurring background,
   ⇒ Releases during normal operations,
   ⇒ World-wide weapons testing, and
   ⇒ Major global nuclear accidents

PROGRAM BASIS
(Continued)

2. Provide the means to verify the effectiveness of the Rancho Seco Nuclear Station Radiological Effluents Control Program.

3. Meet the minimum detectable limits for radioisotopes in environmental samples.

4. Provide quantitative measurements in the gaseous (airborne particulate), liquid, and direct radiation exposure pathways for radionuclides.

5. Provide indications of the largest potential radiation exposure for individuals as a result of radionuclides in the principal exposure pathways.

The Program is developed and conducted using recognized standards and practices NRC79a, NRC79b, NUREG79, and NUREG80a.

REMP CHANGES

The REMP manual and sampling program was not revised during 2006.

EXPOSURE PATHWAYS

The fundamental parameters, which have been defined prior to monitoring the environs, are:

1. Identification of the effluent release pathways

2. Identification of the human exposure pathways

3. Identification of the land use parameters by the population within a two-mile radius of the plant site.

Each of these three parameters is discussed below.

Effluent Release Pathways

There are two principal pathways, which may result in human exposure to radiation and radioactive material originating from Station operation:

1. Liquid effluents and

2. Direct radiation from these effluents and onsite sources.

Liquid Effluents

In the liquid exposure pathway, humans can ingest radioactive materials in surface waters directly or indirectly through the consumption of aquatic foods such as fish and shellfish. Humans can consume vegetation, which is irrigated with Clay Creek water, which may contain radioactive material. Another exposure pathway from liquid effluents results from the consumption of animal products such as meat and milk from animals, which have fed upon irrigated vegetation and/ or consumed Clay Creek water.

Direct Radiation

In the direct radiation pathway, potential radiation exposure may occur from radioactive material storage areas, which are contained within the site boundary. People can potentially be exposed to direct radiation from ground deposition of particulates deposited on the ground from liquid effluents. With the off-loading of spent fuel to the ISFSI, the ISFSI has become part of the direct radiation pathway.

LAND USE CENSUS

On a biennial basis, a land use census is conducted within a two-mile radius to identify any changes in the human exposure pathways. The Land Use Census is used to determine the changes needed for REMP monitoring activities. The results of the land use census conducted during 2005/ 2006 are presented in Appendix A of this Report. The next scheduled land use census will be conducted in 2007/ 2008 and reported in the 2008 AREOR. From data obtained from the Land Use Census, exposure pathways are analyzed through a systematic process, which identifies a sample medium, or organism that is found to potentially contribute to an individual's radiation exposure. Usage and bioaccumulation factors (NRC77) are then specified which represent the magnitude of radioactive material transfer through the food chain to a receptor. The analysis of the effluent and exposure pathways enables monitoring sites to be identified as "indicator" (for sites at which the potential effects of Station effluents would be readily detected) or "control" (for those sites which are not expected to be influenced by Station operation). The analysis results of samples obtained at indicator and control sites are routinely compared to identify potential exposures above background levels.

MONITORING LOCATION SELECTION

The REMP maintains the monitoring sites required by the REMP manual, Table 6. This program is supplemented with additional samples to compensate for changes in the radiological environment surrounding Rancho Seco. The California Department of Health Services also selected some of the monitoring sites as part of their monitoring programs. Indicator sites are placed in areas, which would be most sensitive to the effects of Station effluents such as downwind or downstream areas near the Station. If radioactive material is detected above background at any of these indicator sites, observed potential exposure and dose to humans can be estimated to verify the effectiveness of the Offsite Dose Calculation Manual in predicting potential exposures or doses. It is important to note that the detection of radioactive material in indicator samples does not necessarily mean that its presence can be attributed to Rancho Seco operations. Moreover, especially with liquid effluent pathway samples, the detection of radioactive material is difficult to interpret since it is unknown when the material was deposited. In many instances, the observed radioactive material could correctly be ascribed to historical (pre-2006) depositions.

Control locations provide data that should not be influenced by the operation of Rancho Seco. These locations are selected based upon distance from the Station in the upwind or upstream direction of the effluent release pathways. Samples obtained from control locations should, upon analysis, reveal information about the presence and distribution of naturally occurring and man-made radioactive materials. Data from these locations are used to aid in the discrimination between the effects of Rancho Seco releases and other natural phenomena or accidental releases, which may result in human exposure.

Liquid radioactive effluents are discharged in batches from two onsite Retention Basins into "No Name" Creek located southwest of the Station. Dilution water, obtained from the Folsom South Canal, is discharged into "No Name" Creek to give reasonable assurance of compliance with the 10CFR50, Appendix I dose guidelines. "No Name" Creek flows southerly into the Clay Creek. Without this dilution water flow, the Clay Creek would be in a dry state for most of the year.

Beyond the Site Boundary at a point north of Highway 104, the Clay Creek empties into the Hadselville Creek. Hadselville Creek then empties into the Laguna Creek at a point west of North Clay Station Road near the Folsom South Canal. Finally, Laguna Creek flows into the Cosumnes River at a point located approximately 20 straight-line miles west of Rancho Seco. Since this stream system is the only routine release pathway for liquid radioactive and non-radioactive effluents from the Station, the liquid exposure pathway indicator sites are located along these creeks and nearby land.

MONITORING LOCATION SELECTION (continued)

The direct radiation pathway is monitored principally through a network of monitoring badges at sites distributed in sectors centered on the Station. The badges are located primarily at the site, residential, and recreational areas around the Rancho Seco location. This design provides the capability to easily detect Station-induced direct radiation contributions to the observed terrestrial and cosmic direct radiation background.

Some badges have been sited in special locations to record direct radiation resulting from known depositions of radioactive material and to provide 10 CFR Part 72 license required data for the Interim Spent Fuel Storage Installation (ISFSI).

Appendix B contains a detailed description and illustration of the REMP sample and monitoring locations.

SAMPLE MEDIA

Samples are collected from predetermined monitoring sites at a specified frequency. The sample media chosen is a function of the type of monitoring desired and coincides with one of the following exposure pathways:

- o Atmospheric
- o Direct radiation
- o Terrestrial
- o Aquatic life
- o Water

Atmospheric monitoring is accomplished by filtering a volume of air using a mechanical air pump to collect particulates with a particulate filter paper. Three air sampler locations are used to collect weekly air samples. One location (Meteorological Tower) is a control location and the remaining two locations are indicator locations on the plant site.

Direct radiation monitoring is achieved by placing monitoring badges at aboveground sites. The monitoring badges respond to, and record the amount of, gamma radiation exposure. The source of this gamma radiation exposure is varied and includes potential Station effluents, naturally occurring terrestrial, and cosmogonic radionuclides. The monitoring badges are also influenced by seasonal and global (fallout) radiation sources.

SAMPLE MEDIA
(Continued)

There are 33 sites, which are monitored within a 10-mile radius of the Station. The monitoring badges are placed at the Station Industrial Area Boundary, near the property boundary, locations of interest such as nearby residences, and at control locations located beyond five miles of the Station.

Terrestrial monitoring is accomplished by obtaining samples of sediment and garden vegetation to measure the quantity of radioactive material deposited from liquid effluents. There are two mud and silt (sediment) and 2 garden vegetation locations.

Aquatic monitoring includes the sampling of fish. There are four fish sample locations.

Water monitoring includes samples of surface, runoff, drinking, and well sources from locations in the liquid effluent pathway and from area wells. The six surface water sampling locations monitor site supply water (Folsom South Canal), runoff water and water discharged from the Station. Drinking water is sampled from two groundwater wells and three drinking water taps.

SAMPLE ANALYSIS & DATA HANDLING

The laboratory, which provides radio-analytical services for the Program, is Eberline Services located in Richmond, California. Sample analysis results submitted by Eberline Services are reviewed for accuracy and completeness and then entered into a computerized database for evaluation.

Data comparisons are made between individual control and indicator sample sites to isolate potential Station influences on the measurement results.

The summarized results of the 2006 Radiological Environmental Monitoring Program are presented in Table 2.

Individual (raw data) results are presented in Appendix F, Tables F-1 through F-9.

REGULATORY REPORTING LEVELS

Sample analysis data is reviewed and evaluated by the Radiological Health Supervisor as the results are received. All sample analysis results are reviewed for correct sensitivity and anomalies.

REGULATORY REPORTING LEVELS
(Continued)

The activity concentration values listed in Table E-1 are the environmental Fuel Cycle Dose quantities that, if exceeded, require a Special Report to be submitted to the USNRC. In accordance with the REMP Manual (Section 5, Fuel Cycle Dose), the Special Report must include an evaluation of any release conditions, environmental factors or other aspects, which caused the reporting limits to be exceeded.

In addition to the Fuel Cycle Dose reporting requirements, a Special Report is required to be submitted to the USNRC when more than one of the radionuclides in Table E-1 are detected in the sampling medium and the summed ratio of detected activity concentration to the respective Reporting Level concentration is greater than, or equal to, unity (1). When radionuclides other than those listed in Table E-1 are detected which are a result of Station effluents, a Special Report is required to be submitted if the potential annual dose commitment exceeds the 10 CFR 50, Appendix I guidelines.

No reports of the types described above were required to be submitted during 2006.

SENSITIVITY OF THE REMP MEASUREMENT PROCESS

All Program measurements must be performed at a sensitivity, which meets USNRC requirements. This sensitivity is determined "before the fact" (*a priori*) for each radionuclide of interest and sample analysis type. Typical controllable sensitivity parameters include:

- ⇒ Sample volume or mass
- ⇒ Sampling efficiency
- ⇒ Time from sample collection to measurement
- ⇒ Instrument detection efficiency for the nuclides (energies) of interest
- ⇒ Background radiation levels
- ⇒ Chemical recovery factors

SENSITIVITY OF THE REMP MEASUREMENT PROCESS (continued)

By adjusting and controlling each of these parameters to maximize measurement process efficiency, a maximum sensitivity level (activity concentration) can be specified for each nuclide of interest and analysis type while maintaining an economic measurement process. The maximum sensitivities in the REMP are specified by the USNRC in the REMP Manual approved for Rancho Seco. These sensitivities are referred to as "LLD's", an acronym for "Lower Limit of Detection". LLD's are specified on an "*a priori*" basis and apply to routine measurement process capabilities when no other interfering radioactivity is present. The word "routine" is emphasized since occasional circumstances, such as limited sample mass, elevated levels of background radiation and interfering nuclides can contribute to sensitivity degradation.

Such occurrences are normally noted and reported during the conduct of REMP activities.

Meeting the LLD requirements is a quality control function shared by both REMP and the analytical laboratory personnel. Once the laboratory establishes values for the controllable parameters for each analysis type, sample chain of custody controls ensure that these parameters are upheld. If all parameters are upheld, then compliance with the LLD requirements has been demonstrated. The specific LLD values for Program measurements are included in Table E-2.

Since most of the samples analyzed result in the detection decision "activity not identified", a Minimum Detectable Activity (MDA) concentration value is calculated and reported. This value can be thought of as the LLD-at-the-time-of-counting since it is calculated using an equation, which is similar to the one, used to establish LLD parameters. The biggest difference is that actual (not "*a priori*") parameters are used, including interference from natural radioactive material in the sample. It is important to note that MDA's are reported only for those measurements where the "activity not identified" decision has already been made.

MDA values are used primarily to identify changes in the measurement process and to convey more information about the measurement itself. Without the use of the MDA concept, most Program measurements would be reported simply as "<LLD". With MDA used, Program measurements are reported as "< xxx " where "xxx" is the calculated MDA concentration.

TABLE E-1

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Analysis	Water (pCi/L)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Food Products (pCi/kg, wet)
H-3	20000[a]			
Mn-54	1000		30000	
Co-60	300		10000	
Zn-65	300		20000	
Cs-134	30	10	1000	1000
Cs-137	50	20	2000	2000
Gross Beta	40 [b]	2 [c]		

Notes: [a] For drinking water samples, this is a 40 CFR Part 141 value

[b] Gross Beta activity in water of ten times the yearly mean of the control samples is indicated as the level that gamma isotopic analysis should be performed on the individual sample (NRC79a). Gamma isotopic analysis on each water sample is required by the REMP and therefore this requirement does not apply.

[c] Gross Beta activity is air of ten times the yearly mean of the control samples is indicated as the level that gamma isotopic analysis should be performed on the individual sample. The value indicated is Site specific.

TABLE E-2

MAXIMUM (REQUIRED) LLD VALUES FOR ENVIRONMENTAL SAMPLES[ac] (NRC79A)

Analysis (d)	Water (pCi/L)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Food Products (pCi/kg, dry)	Sediment (pCi/kg, dry)
Gross Beta	4[b]	0.01			
H-3	2000 (1000, [b])				
Mn-54	15		130		
Co-60	15		130		150[e]
Zn-65	30		260		
Cs-134	15 (10[b])	0.01[d]	130	60	150
Cs-137	18 (10[b])	0.01[d]	130	60	150

Notes:

(a) Analysis requirements are those recommended in the BTP [NRC79A] and RETS [NUREG79].

(b) LLD for water samples utilized for human consumption only [NUREG79].

(c) Other peaks, which are measurable and identifiable, together with the nuclides in Table E-2, shall be identified and reported.

(d) Composite analysis LLD is Shown; individual sample LLD is 0.05 pCi/m^3 (Site-specific value).

(e) LLD for Mud and Silt Co-60 is not required by RETS [NUREG79]. This value is consistent with the RETS required value for Cs-134 and Cs-137.

APPENDIX F

2006 SAMPLE ANALYSIS RAW DATA TABLES

TABLE F-1
2006 WEEKLY AIR SAMPLE SUMMARY

Gross Beta Activity in Air Particulates
(pCi/m^3)

Collect Date	RAS01CO	2 sigma	RAS03MO	2 sigma	RAS07EO	2 sigma
1/3/2006	0.008	0.001	0.007	0.001	0.015	0.002
1/10/2006	0.014	0.001	0.013	0.001	0.014	0.001
1/17/2006	0.018	0.001	0.019	0.001	0.020	0.001
1/23/2006	0.014	0.001	0.014	0.001	0.013	0.001
1/31/2006	0.018	0.001	0.017	0.001	0.018	0.001
2/6/2006	0.013	0.001	0.013	0.001	0.013	0.001
2/14/2006	0.037	0.001	0.038	0.002	0.039	0.002
2/21/2006	0.014	0.001	0.013	0.001	0.017	0.001
2/28/2006	0.041	0.001	0.035	0.001	0.039	0.002
3/6/2006	0.009	0.001	0.009	0.001	0.009	0.001
3/14/2006	0.009	0.001	0.008	0.001	0.010	0.001
3/21/2006	0.010	0.001	0.010	0.001	0.009	0.001
3/28/2006	0.013	0.000	0.012	0.001	0.012	0.001
4/4/2006	0.008	0.001	0.009	0.001	0.009	0.001
4/11/2006	0.007	0.001	0.008	0.001	0.007	0.001
4/18/2006	0.011	0.001	0.010	0.001	0.009	0.001
4/25/2006	0.014	0.001	0.012	0.001	0.013	0.001
5/2/2006	0.019	0.001	0.019	0.001	0.019	0.001
5/9/2006	0.017	0.001	0.017	0.001	0.017	0.001
5/16/2006	0.023	0.001	0.023	0.001	0.023	0.001
5/24/2006	0.013	0.001	0.014	0.001	0.014	0.001
5/30/2006	0.010	0.001	0.010	0.001	0.010	0.001
6/6/2006	0.013	0.005	0.010	0.001	0.011	0.001
6/13/2006	0.013	0.001	0.014	0.001	0.013	0.001
6/20/2006	0.016	0.001	0.014	0.001	0.014	0.001
6/27/2006	0.024	0.001	0.024	0.001	0.023	0.001

TABLE F-1
2006 WEEKLY AIR SAMPLE SUMMARY
(Continued)

Gross Beta Activity in Air Particulates
(pCi/m^3)

Collect Date	RAS01CO	2 sigma	RAS03MO	2 sigma	RAS07EO	2 sigma
7/5/2006	0.016	0.001	0.017	0.001	0.016	0.001
7/11/2006	0.019	0.001	0.020	0.003	0.018	0.002
7/17/2006	0.018	0.001	0.018	0.001	0.017	0.002
7/25/2006	0.035	0.002	0.035	0.002	0.035	0.002
8/1/2006	0.019	0.001	0.018	0.001	0.017	0.001
8/8/2006	0.016	0.001	0.016	0.001	0.018	0.001
8/15/2006	0.019	0.001	0.019	0.001	0.020	0.001
8/22/2006	0.019	0.001	0.017	0.001	0.019	0.001
8/29/2006	0.022	0.002	0.021	0.001	0.021	0.001
9/5/2006	0.024	0.001	0.023	0.002	0.025	0.002
9/13/2006	0.027	0.001	0.024	0.001	0.028	0.001
9/19/2006	0.021	0.001	0.020	0.001	0.021	0.001
9/26/2006	0.023	0.001	0.019	0.001	0.022	0.001
10/3/2006	0.030	0.001	0.030	0.001	0.030	0.001
10/10/2006	0.028	0.001	0.032	0.003	0.025	0.001
10/17/2006	0.032	0.002	0.030	0.002	0.030	0.001
10/24/2006	0.035	0.001	0.032	0.001	0.033	0.001
10/31/2006	0.040	0.002	0.037	0.002	0.027	0.001
11/7/2006	0.030	0.002	0.027	0.001	0.030	0.001
11/14/2006	0.020	0.002	0.016	0.001	0.017	0.001
11/21/2006	0.022	0.001	0.020	0.001	0.022	0.001
11/28/2006	0.019	0.001	0.019	0.001	0.019	0.001
12/5/2006	0.039	0.002	0.038	0.002	0.040	0.001
12/12/2006	0.038	0.002	0.036	0.002	0.036	0.002
12/19/2006	0.020	0.001	0.020	0.001	0.021	0.001
12/27/2006	0.038	0.002	0.037	0.002	0.037	0.001

Table F-2

2006 Luxel Summary (Direct Radiation)

Quarterly
(mRem)

Location Number	ID Number	Description	Type	2006-1	2006-2	2006-3	2006-4
1	RTL0.3RO	Site fence north of spray ponds	I	19	19	19	16
2	RTL0.3CO	NE corner of parking lot	I	18	18	18	18
3	RTL0.3NO	Site fence west near south of rail spur	I	23	25	19	23
4	RTL0.3LO	Site fence south of canal pumps	I	19	20	18	19
5	RTL0.3HO	Site south of Admin Bldg.	I	18	20	17	16
6	RTL0.4FO	NE corner of PV-1	I	18	17	16	17
7	RTL0.5CO	RS entrance sign	I	19	20	16	19
11	RTL0.6KO	Tokay substation	I	17	19	17	17
16	RTL2.7MO	Tippling's residence	I	17	16	14	16
17	RTL8.2KO	Elliott Cemetery	C	19	20	Missing	21
18	RTL7.8CO	Sam Jaber residence	C	17	16	14	15
19	RTL1.8FO	RS Lake Maint. Bldg.	I	16	16	13	15
20	RTL1.5MO	Clay/ Kirkwood streets	I	18	18	17	16
26	RTL3.9KO	Borden Road	I	17	19	15	16
30	RTL7.4MO	Herald Fire Station	C	18	21	22	19
31	RTL3.7NO	Folsom South Canal back entrance	I	19	21	18	19
33	RTL3.8MO	Folsom South Canal/ Hwy 104	I	17	21	17	18
35	RTL1.9NO	Hadselville/ Clay Creeks	I	16	22	18	18
43	RTL1.7FO	RS Lake Well Encl.	I	18	15	15	15
46	RTL1.4DO	Hwy 104 mile marker 13.15	I	19	23	16	20
55	RTL8.0PO	Dillard School	C	17	20	16	18
63	RTL0.8DO	Marcial Ranch	I	17	19	17	17
65	RTL0.6MO	Site Boundary Garden	I	19	18	16	17
66	RTL0.4NO	Soil depression area	I	29	32	30	30
67	RTL0.4NO1	Dredge pile	I	19	21	17	19
68	RTL0.3PO	Site fence west by ISOB	I	25	25	19	21
88	RTL0.3NP	ISFSI south fence	I	18	22	21	20
89	RTL0.4NP	ISFSI south fence	I	19	19	18	19
90	RTL0.5NP	ISFSI west fence	I	24	24	20	24
91	RTL0.3QP	Site fence NW corner	I	19	21	18	17
92	RTL0.7QP	Railroad spur	I	18	19	15	18
93	RTL0.7JP	Clay Rd east south of site	I	18	17	15	16
94	RTL0.4PP	ISFSI fence north	I	23	23	20	21

I = Indicator Location / C = Control Location

Table F-3

2006 Garden Vegetables

Semi-annual
(pCi/kg, wet)

Sample ID	Collect Date	Mn-54	Co-60	Zn-65	Cs-134	Cs-137	2 Sigma	Comments
RLV0.6MO	6/26/2006	<15.0	<16.9	<38.5	<17.4	<14.1		
RLV18.0KO	6/22/2006	<2.51	<2.83	<7.08	<2.75	<2.12		
RLV0.6MO	10/4/2006	<1.55	<4.15	<4.65	<1.78	3.51	+- 1.3	Cabbage/ Cucumber
RLV0.6MO	10/11/2006	<1.86	<2.18	<5.17	<2.12	<1.82		Vegetables
RLV0.6MO	10/18/2006	<8.43	<9.31	<23.0	<9.64	<6.83		Tomatoes
RLV0.6MO	10/25/2006	<4.09	<4.33	<9.70	<9.49	6.06	+- 3.6	Carrots
RLV18.0KO	11/1/2006	<3.02	<4.21	<7.44	<3.81	<3.07		Vegetables

Table F-4

2006 SEDIMENT

Quarterly
(pCi/kg)

Sample ID	Collect Date	Mn-54	Co-60	Zn-65	Cs-134	Cs-137	2sigma
RMS0.3MO	1/17/2006	<4.81	15.5	<10.8	<5.23	132	5.6
RMS0.6MOQ	1/17/2006	<7.28	60.7	<17.3	<8.73	539	13
RMS0.6MO	1/17/2006	<5.58	55.8	<15.6	<7.46	742	11
RMS0.6MOQ	4/25/2006	<4.89	23.8	<12.4	<10.5	112	6.1
RMS0.6MO	4/25/2006	<6.15	26.0	<14.9	<8.18	124	8.1
RMS0.3MO	4/25/2006	<5.20	21.1	<13.1	<12.9	38.9	6.7
RMS0.6MO	7/25/2006	<6.77	<6.77	<15.8	<8.30	228	9.2
RMS0.3MO	7/25/2006	<7.96	18.5	<20.2	<12.5	203	11
RMS0.6MOQ	7/25/2006	<7.70	12.3	<19.3	<9.96	258	13
RMS0.3MO	10/24/2006	<4.59	9.76	<10.5	<5.48	49.1	4.9
RMS0.6MOQ	10/24/2006	<1.84	20.6	<4.80	<2.46	101	3.7
RMS0.6MO	10/24/2006	<4.34	29.8	<12.2	<5.20	210	6.5

TABLE F-5

2006 FISH

Semi-Annual
(pCi/kg, wet)

Sample ID	Collect Date	Mn-54	Co-60	Zn-65	Cs-134	Cs-137	2 Sigma
RFS0.6MO(1)	4/21/2006	<11.0	<12.2	<27.6	<13.2	40.9	12
RFS1.8NO(1)	10/12/2006	<4.8	<4.84	<11.8	<6.03	13.8	5.5
RFS0.7NO(1)	10/10/2006	<17.6	<18.8	<42.7	<20.0	51.4	13
RFS0.6MO(1)	10/5/2006	<21.0	<21.5	<54.2	<24.9	<20.8	

Note: (1) =Predator Species

TABLE F-6

2006 WELL WATER

Quarterly
(pCi/L)

Sample ID	Collect Date	Gross Beta	Tritium	Mn-54	Co-60	Zn-65	Cs-134	Cs-137
RWW0.8DO	2/6/2006	2.68	<178	<5.97	<5.74	<11.6	<7.52	<6.33
RWW0.3EO	2/6/2006	3.97	<177	<7.15	<7.15	<14.7	<9.00	<7.69
RWW0.3EO	5/9/2006	3.83	<174	<12.0	<13.5	<29.1	<14.4	<12.8
RWW0.8DO	5/9/2006	3.86	<176	<12.2	<12.9	<29	<15.0	<13.4
RWW0.3EO	8/9/2006	3.40	<164	<13.0	<11.6	<29.8	<16.0	<24.0
RWW0.8DO	8/9/2006	3.72	<161	<13.6	<13.0	<31.6	<17.4	<14.4
RWW0.8DO	11/7/2006	<1.84	<154	<10.8	<15.4	<21.7	<20.2	<11.5
RWW0.3EO	11/7/2006	3.15	<154	<9.75	<10.6	<21.0	<12.4	<10.4

TABLE F-7

2006 RUNOFF WATER

Biweekly
(pCi/L)

Sample ID	Collect Date	Tritium	Mn-54	Co-60	Zn-65	Cs-134	Cs-137
RRW0.6MO	1/10/2006	<165	<6.28	<6.36	<13.2	<8.00	<6.39
RRW0.6MO	1/24/2006	<176	<9.10	<11.4	<19.1	<11.5	<8.77
RRW0.6MO	2/6/2006	<175	<9.12	<10.5	<20.4	<11.4	<8.91
RRW0.6MO	2/21/2006	<253	<7.68	<7.80	<16.8	<8.72	<7.75
RRW0.6MO	3/6/2006	<252	<6.80	<6.99	<16.0	<8.30	<5.96
RRW0.6MOQ	3/6/2006	<252	<6.83	<8.03	<16.9	<8.93	<7.79
RRW0.6MO	3/21/2006	<150	<12.8	<14.2	<30.1	<15.1	<13.4
RRW0.6MO	4/4/2006	<153	<7.21	<8.74	<16.4	<9.48	<7.84
RRW0.6MO	4/18/2006	<156	<6.86	<8.62	<16.5	<9.53	<7.92
RRW0.6MO	5/2/2006	<176	<12.2	<14.0	<30.0	<19.3	<13
RRW0.6MO	5/16/2006	<219	<9.03	<9.53	<18.9	<10.2	<8.06
RRW0.6MO	5/30/2006	<140	<6.62	<8.00	<16.0	<9.08	<7.45
RRW0.6MO	6/14/2006	<176	<6.84	<8.00	<16.3	<8.79	<6.58
RRW0.6MOQ	6/14/2006	<173	<33.1	<35.9	<76.7	<41.1	<34.3
RRW0.6MO	6/27/2006	<177	<31.0	<34.0	<73.0	<36.0	<29.6
RRW0.6MO	7/12/2006	<155	<17.2	<15.6	<39.5	<21.4	<17.8
RRW0.6MO	7/25/2006	<138	<13.7	<12.8	<30.2	<17.3	<14.4
RRW0.6MO	8/9/2006	<158	<10.9	<10.1	<23.1	<13.5	<11.2
RRW0.6MO	8/22/2006	<163	<11.7	<11.2	<26.2	<14.6	<11.8
RRW0.6MOQ	9/5/2006	<176	<13.5	<12.3	<30.7	<21.0	<14.2
RRW0.6MO	9/5/2006	<173	<11.6	<10.6	<26.7	<14.0	<11.9
RRW0.6MO	9/19/2006	<154	<11.7	<11.1	<26.8	<14.8	<12.3
RRW0.6MO	10/4/2006	<167	<12.3	<11.4	<27.0	<15.2	<12.8
RRW0.6MO	10/18/2006	<168	<11.1	<10.6	<24.7	<14.6	<11.8
RRW0.6MO	10/30/2006	<164	<5.88	<6.06	<12.5	<13.2	<6.33
RRW0.6MO	11/13/2006	<154	<9.79	<10.0	<19.4	<15.6	<10.1
RRW0.6MO	11/27/2006	<172	<12.4	<17.8	<25.2	<15.7	<12.6
RRW0.6MO	12/12/2006	<172	<10.9	<10.9	<26.1	<13.6	<11.3
RRW0.6MOQ	12/27/2006	<94.8	<13.7	<14.9	<35.7	<17.2	<14.6
RRW0.6MO	12/27/2006	<93.3	<4.28	<5.28	<9.88	<5.63	<4.65

TABLE F-8
2006 SURFACE WATER

Monthly Grab / Monthly Composite
(pCi/L)

Sample ID	Collect Date	Tritium	Mn-54	Co-60	Zn-65	Cs-134	Cs-137
RSW0.7NO	1/23/2006	<176	<7.32	<8.17	<18.1	<9.49	<7.20
RSW3.7NO	1/23/2006	<173	<7.71	<7.82	<15.6	<8.49	<7.00
RSW1.8NO	1/23/2006	<180	<8.31	<8.97	<15.6	<9.41	<8.30
RSW1.3FO	1/23/2006	<176	<13.6	<13.0	<34.9	<17.6	<12.7
RSW0.3MO	1/23/2006	<179	<7.51	<7.38	<17.3	<8.50	<7.45
RSW1.8NOQ	1/23/2006	<178	<7.61	<7.53	<16.2	<8.53	<7.48
RSW0.7NO	2/21/2006	<254	<10.0	<10.0	<18.8	<11.7	<9.55
RSW0.3MO	2/21/2006	<252	<8.45	<7.23	<18.8	<8.57	<7.63
RSW1.3FO	2/21/2006	<252	<12.6	<13.3	<31.8	<19.8	<13.0
RSW1.8NO	2/21/2006	<256	<7.41	<8.60	<18.4	<17.9	<7.28
RSW3.7NO	2/21/2006	<258	<6.84	<7.94	<15.1	<8.18	<7.33
RSW1.3FO	3/21/2006	<153	<7.42	<8.04	<17.6	<8.25	<7.37
RSW0.3MO	3/21/2006	<151	<6.62	<8.25	<14.7	<8.42	<7.12
RSW1.8NO	3/22/2006	<152	<7.43	<7.90	<17.0	<8.74	<7.33
RSW3.7NO	3/22/2006	<148	<6.62	<7.98	<14.4	<8.16	<7.28
RSW0.7NO	3/22/2006	<152	<12.4	<12.8	<29.1	<14.5	<12.8
RSW3.7NO	4/25/2006	<264	<11.6	<13.4	<26.9	<13.7	<13.2
RSW1.8NOQ	4/25/2006	<258	<6.61	<8.70	<16.1	<9.39	<7.72
RSW0.7NO	4/25/2006	<260	<9.86	<10.7	<17.9	<10.3	<8.57
RSW1.8NO	4/25/2006	<260	<8.02	<7.94	<16.1	<8.87	<7.64
RSW1.3FO	4/25/2006	<262	<7.81	<7.42	<15.8	<8.97	<7.69
RSW0.3MO	4/25/2006	<267	<12.0	<13.5	<28.8	<14.6	<12.5
RSW1.3FO	5/24/2006	<100	<7.52	<9.20	<19.2	<9.92	<8.74
RSW0.3MO	5/24/2006	<142	<6.94	<8.23	<16.6	<9.16	<7.79
RSW1.8NO	5/24/2006	<99.9	<12.1	<12.9	<28.6	<15.1	<12.3
RSW3.7NO	5/24/2006	<170	<13.9	<14.3	<32.8	<16.3	<14.5
RSW0.7NO	5/24/2006	<142	<6.13	<7.11	<12.4	<7.40	<5.89
RSW3.7NO	6/28/2006	<179	<10.4	<13.5	<25.2	<14.1	<12.1
RSW1.3FO	6/28/2006	<182	<23.9	<24.2	<54.4	<28.4	<22.5
RSW0.3MO	6/28/2006	<177	<18.1	<20.2	<48.2	<21.2	<18.9
RSW1.8NO	6/28/2006	<184	<11.7	<13.0	<24.8	<13.3	<12.7
RSW0.7NO	6/28/2006	<177	<24.0	<24.6	<55.0	<27.7	<23.2

TABLE F-8
(Continued)

2006 SURFACE WATER
Monthly Grab/ Monthly Composite
(pCi/L)

Sample ID	Collect Date	Tritium	Mn-54	Co-60	Zn-65	Cs-134	Cs-137
RSW1.3FO	7/25/2006	<138	<11.7	<10.3	<27.5	<14.0	<11.6
RSW0.3MO	7/25/2006	<139	<10.6	<10.0	<26.0	<13.3	<10.9
RSW1.8NO	7/25/2006	<140	<12.2	<10.9	<31.1	<15.4	<12.4
RSW3.7NO	7/25/2006	<140	<11.9	<10.8	<27.4	<15.1	<12.4
RSW1.8NOQ	7/25/2006	<139	<11.4	<10.3	<27.4	<13.9	<11.9
RSW0.7NO	7/25/2006	<140	<11.4	<10.4	<28.7	<14.3	<11.8
RSW0.3MO	8/22/2006	<163	<12.3	<11.5	<27.6	<14.8	<12.4
RSW1.8NO	8/22/2006	<162	<11.5	<10.7	<26.8	<14.2	<11.4
RSW1.3FO	8/22/2006	<161	<11.3	<10.2	<25.3	<14.0	<11.4
RSW0.7NO	8/22/2006	<162	<12.3	<12.0	<27.0	<15.0	<12.6
RSW3.7NO	8/22/2006	<166	<11.6	<10.8	<26.1	<13.6	<11.5
RSW1.8NO	9/25/2006	<154	<11.2	<10.5	<24.4	<13.9	<11.9
RSW3.7NO	9/25/2006	<154	<4.66	<5.27	<10.5	<5.90	<4.36
RSW0.7NO	9/25/2006	<155	<10.5	<10.1	<23.7	<13.0	<10.9
RSW1.3FO	9/25/2006	<157	<11.5	<10.8	<25.4	<14.7	<12.0
RSW0.3MO	9/25/2006	<153	<11.7	<18.2	<26.4	<13.9	<11.8
RSW1.3FO	10/24/2006	<164	<10.9	<11.1	<22.2	<13.8	<12.1
RSW1.8NOQ	10/24/2006	<169	<10.0	<10.8	<24.6	<13.2	<11.0
RSW0.3MO	10/24/2006	<181	<9.06	<9.51	<22.3	<10.8	<9.58
RSW0.7NO	10/24/2006	<170	<10.5	<10.5	<23.5	<13.0	<10.8
RSW1.8NO	10/24/2006	<166	<9.25	<10.3	<19.3	<18.1	<10.1
RSW3.7NO	10/24/2006	<171	<10.6	<10.7	<22.3	<13.3	<11.2
RSW1.8NO	11/29/2006	<172	<15.7	<16.4	<40.5	<19.0	<16.3
RSW3.7NO	11/29/2006	<177	<7.84	<5.60	<11.2	<5.97	<4.93
RSW0.7NO	11/29/2006	<171	<7.11	<7.71	<15.4	<9.34	<8.06
RSW1.3FO	11/29/2006	<171	<6.46	<7.75	<14.3	<7.78	<7.26
RSW0.3MO	11/29/2006	<171	<15.5	<15.5	<34.0	<35.3	<20.0
RSW1.3FO	12/18/2006	<91.4	<16.2	<16.1	<43.5	<19.4	<16.4
RSW0.3MO	12/19/2006	<91.4	<9.96	<10.4	<23.4	<12.7	<10.6
RSW1.8NO	12/19/2006	<94.9	<10.6	<10.9	<25.9	<14.5	<10.9
RSW3.7NO	12/19/2006	<93.5	<7.19	<7.93	<15.6	<8.15	<7.28
RSW0.7NO	12/19/2006	<93.7	<6.99	<7.66	<14.6	<8.40	<7.19

TABLE F-9
2006 Drinking Water
Monthly
(pCi/L)

Sample ID	Collect Date	Gross Beta	Tritium	Mn-54	Co-60	Zn-65	Cs-134	Cs-137
RDW0.2PP	1/23/2006	3.98	<180	<13.1	<15.0	<28.1	<26.8	<14.8
RDW0.1GO	1/23/2006	4.16	<174	<14.5	<13.8	<32.0	<21.9	<13.6
RDW1.8FP	1/23/2006	3.07	<176	<6.57	<8.80	<15.1	<9.65	<8.49
RDW0.2PP	2/21/2006	3.94	<254	<9.91	<8.87	<19.2	<11.7	<9.69
RDW0.1GO	2/21/2006	3.82	<251	<13.5	<13.8	<31.0	<16.0	<13.6
RDW1.8FP	2/21/2006	4.54	<253	<7.56	<7.72	<17.8	<9.12	<7.68
RDW1.8FP	3/21/2006	3.70	<151	<6.63	<8.53	<15.2	<8.37	<7.34
RDW0.2PP	3/21/2006	3.05	<152	<7.35	<8.39	<17.4	<8.77	<8.11
RDW0.1GO	3/21/2006	3.32	<153	<8.33	<8.89	<19.6	<11.5	<9.22
RDW0.2PP	4/25/2006	3.11	<263	<6.52	<8.41	<15.5	<8.85	<7.61
RDW0.1GO	4/25/2006	4.20	<268	<9.79	<9.50	<19.8	<10.2	<8.25
RDW1.8FP	4/25/2006	4.83	<255	<7.44	<7.64	<14.3	<8.52	<7.13
RDW0.2PP	5/24/2006	3.95	<141	<7.50	<8.32	<16.6	<7.87	<6.74
RDW0.1GO	5/24/2006	3.99	<142	<5.30	<6.04	<11.6	<6.78	<5.28
RDW1.8FP	5/24/2006	2.77	<138	<12.7	<12.6	<32.6	<14.6	<12.5
RDW1.8FP	6/27/2006	<2.97	<179	<6.61	<14.0	<15.6	<8.63	<7.62
RDW0.2PP	6/28/2006	4.08	<183	<25.7	<58.8	<63.0	<32.0	<25.6
RDW0.1GO	6/28/2006	4.26	<174	<24.9	<27.2	<58.9	<28.8	<24.3
RDW0.1GO	7/25/2006	3.88	<138	<11.6	<11.0	<25.9	<14.7	<11.9
RDW0.2PP	7/25/2006	3.15	<139	<11.3	<10.5	<24.7	<14.8	<11.9
RDW1.8FP	7/25/2006	2.72	<140	<7.38	<7.08	<16.2	<8.53	<7.57
RDW0.2PP	8/22/2006	4.18	<161	<11.3	<10.1	<25.4	<13.6	<11.2
RDW1.8FP	8/22/2006	4.14	<162	<11.2	<11.1	<26.4	<13.6	<11.5
RDW0.1GO	8/22/2006	3.15	<163	<11.6	<11.1	<26.0	<14.6	<11.5
RDW1.8FP	9/25/2006	3.26	<154	<11.9	<11.1	<26.7	<15.0	<12.6
RDW0.1GO	9/25/2006	4.26	<153	<11.7	<10.3	<26.0	<14.4	<12.0
RDW0.2PP	9/25/2006	4.03	<155	<4.99	<5.93	<10.8	<6.24	<4.94
RDW0.2PP	10/24/2006	4.14	<168	<3.11	<3.46	<6.80	<3.74	<2.91
RDW1.8FP	10/24/2006	3.06	<182	<4.50	<5.08	<10.2	<5.74	<4.79
RDW0.1GO	10/24/2006	4.18	<190	<9.15	<9.53	<18.2	<11.3	<9.75
RDW1.8FP	11/29/2006	3.20	<173	<17.2	<17.9	<43.8	<20.7	<17.3
RDW0.1GO	11/29/2006	2.93	<173	<5.40	<6.21	<11.4	<6.43	<5.19
RDW0.2PP	11/29/2006	2.35	<171	<7.64	<8.60	<16.9	<8.73	<7.56
RDW0.1GO	12/19/2006	4.95	<92.4	<4.59	<4.42	<10.6	<6.27	<4.91
RDW0.2PP	12/19/2006	<2.86	<94.3	<10.5	<10.6	<25.7	<13.4	<10.7
RDW1.8FP	12/19/2006	3.24	<92.8	<16.6	<16.4	<44.1	<23.8	<16.3

APPENDIX G
2006 MISSED SAMPLE REPORT

In accordance with the requirements REMP manual section 3.1, the following samples are being reported as not being collected for the reasons indicated. Corrective action as required by the REMP manual is as indicated.

Air Sampler (Airborne Pathway)

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On January 3, 2006, during routine change out, the air sampler was found not running due to a storm related power outage. Air sampler run time was 5575.3 minutes and the volume did meet the minimum required.

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On February 21, 2006, during routine change out, the air sampler was found not running due to a storm related power outage. Air sampler run time was 4889.3 minutes and the volume did meet the minimum required.

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On February 28, 2006, during routine change out, the air sampler was found not running due to a power outage. Air sampler run time was 9284.2 minutes and the volume did meet the minimum required.

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On March 14, 2006, during routine change out, the air sampler was found not running due to a power outage. Air sampler run time was 6819.5 minutes and the volume did meet the minimum required.

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On April 4, 2006, during routine change out, the air sampler was found not running due to a power outage. Air sampler run time was 9522.8 minutes and the volume did meet the minimum required.

RAS0.3MO, Plant Effluent (indicator) / RAS0.7EO, Rancho Seco Meteorological Tower (control) – On April 11, 2006, during routine change out both air samplers were found not running due to an unscheduled power outage. Air sampler run time was 9032.6 and 9713.9 minutes, respectively. The minimum sample volume was achieved for both air samples.

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On May 2, 2006 during routine change out, the air sampler was found not running due to a power outage. Air sampler run time was 9765.2 minutes and the volume did meet the minimum required.

RAS0.7EO, Rancho Seco Meteorological Tower (control) – On May 30, 2006, during routine change out, the air sampler was found not running due to a scheduled power outage. Air sampler run time was 8151.3 minutes and the volume did meet the minimum required.

APPENDIX G
2005 MISSED SAMPLE REPORT
(Continued)

RAS0.3MO, Plant Effluent (indicator) – On October 10, 2006, during routine change out, the air sampler was found not running due to a Site power outage. Air sampler run time was 2455.2 minutes and the volume did meet the minimum required

RAS0.1CO PAP Building (indicator)/ RAS0.3MO, Plant Effluent (indicator) / RAS0.7EO, Rancho Seco Meteorological Tower (control) - On April 11, 2006, during routine change out the air samplers, it was found that 28 minutes had been lost from the sample for all three samplers due to a power outage. Air sampler run time was 10153.5, 10154.5, and 10446.0 minutes, respectively. The minimum sample volume was achieved for all air samples.

Water monitoring

RRW0.3M0 Plant Effluent (Indicator) – On May 24, 2006 the composite water sampler at the Plant Effluent location was found with less than the normal amount of water collected. Upon investigation it was found the sample pump needed to have the tubing replaced. The sample pump was replaced from a spare sampler. There was sufficient sample for the required analysis.

Direct Monitoring Pathway (Luxel Badge))

RTL8.2KO Elliott Cemetery (Control) – during the third quarter 2006 changeout of the Luxel badges, the badges and cricket cage for the badges was found missing. A search of the area was conducted with no badges of cricket cage found. The fourth quarter badges were replaced at a new, more concealed, location. No results from this location will be available for the third quarter 2006.