



September 06, 2023

L-2023-112
10 CFR 50.36a

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Corrections to the 2021 Annual Radioactive Effluent Release Report

Reference: FPL letter L-2022-023 dated February 23, 2022: 2021 Annual Radioactive Effluent Release Report

By letter dated February 23, 2022 (Reference), Florida Power & Light submitted the 2021 Annual Radioactive Effluent Release Report (ARERR) for St. Lucie Units 1 and 2 pursuant to 10 CFR 50.36a(a)(2) and Technical Specification (TS) 6.9.1.7. The 2021 report provided information for the 12-month period beginning January 1, 2021 and ending December 31, 2021.

Dose calculation errors were found in the land use exposure pathways. Also, an effluent radiation monitor that had been out of service for greater than 30 days should have been reported in Section 2.5. Both items have been corrected and are provided in this submittal. This corrected report replaces the St. Lucie 2021 ARERR report in its entirety.

If you have any questions regarding this submittal, please contact Kenneth Mack at 561-904-3635.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Strand', with a small 'for' written below it.

Dianne Strand
General Manager, Regulatory Affairs
Florida Power & Light Company

Enclosure: Combined Annual Radioactive Effluent Release Report (2021)

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, St. Lucie Nuclear Plant
USNRC Resident Inspector, St. Lucie Nuclear Plant

L-2022-023
Enclosure

ENCLOSURE 1

**COMBINED ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
(10 PAGES)**

**FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNITS 1 AND 2
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 2021 THROUGH DECEMBER 31, 2021**

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2.0 SUPPLEMENTAL INFORMATION

- 2.1 Abnormal Releases or Abnormal Discharges
- 2.2 Non-Routine Planned Discharges
- 2.3 Radioactive Waste Treatment System Changes
- 2.4 Annual Land Use Census Changes
- 2.5 Effluent Monitoring System Inoperability
- 2.6 Offsite Dose Calculation Manual Changes
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3.0 TABLES

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- 3.3 Dose Assessments
- 3.4 Visitor Dose

1.0 PROGRAM DESCRIPTION

Regulatory Limits

The Offsite Dose Calculation Manual (ODCM) Radiological Effluent Control limits applicable to the release of radioactive material in liquid and gaseous effluents are described in the following sections.

Fission and Activation Gases (Noble Gases)

The dose rate due to radioactive materials released in gaseous effluents, from the Site to areas at and beyond the Site boundary, shall be limited to less than or equal to 500 mrem/yr to the whole body and less than or equal to 3000 mrem/yr to the skin.

The air dose due to noble gases released in gaseous effluents from each Unit, to areas at and beyond the Site boundary, shall be limited to:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

Iodine-131, Iodine-133, Tritium, Carbon-14, and Radioactive Material in Particulate Form

The dose rate due to Iodine-131 (I-131), Iodine-133 (I-133), Tritium, and all radionuclides in particulate form with half-lives greater than 8 days, released in gaseous effluents from the Site to areas at and beyond the Site boundary, shall be limited to less than or equal to 1500 mrem/yr to any organ.

The dose to a MEMBER OF THE PUBLIC from I-131, I-133, Tritium, Carbon-14 (C-14), and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from each Unit, to areas at and beyond the Site boundary, shall be limited to:

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ, and
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

Liquid Effluents

The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to 10 times the concentrations specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to $2.0E-4$ $\mu\text{Ci/ml}$ total activity. The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released from each Unit, to unrestricted areas, shall be limited to:

- a. During any calendar quarter: Less than or equal to 1.5 mrem to the whole body and less than or equal to 5 mrem to any organ, and
- b. During any calendar year: Less than or equal to 3 mrem to the whole body and less than or equal to 10 mrem to any organ.

Total Dose

The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrem to the whole body or any organ, except the thyroid which shall be limited to less than or equal to 75 mrem.

Effluent Concentration Limits

Gaseous Effluents

For gaseous effluents, effluent concentration limits (ECL) values are not directly used in release rate calculations since the applicable limits are expressed in terms of dose rate at the Site boundary.

Liquid Effluents

The values specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 are used as the ECL for liquid radioactive effluents released to unrestricted areas. A value of 2.0E-04 $\mu\text{Ci/ml}$ is used as the ECL for dissolved and entrained noble gases in liquid effluents.

Measurements and Approximations of Total Radioactivity

Measurements of total radioactivity in liquid and gaseous radioactive effluents were accomplished in accordance with the sampling and analysis requirements of Tables 4.11-1 and 4.11-2, respectively, of the St. Lucie ODCM. Estimates of errors are in accordance with Methodology Section 4.0.4 of the ODCM.

The estimate of errors associated with values reported are below:

Error Topic	<u>LIQUID</u>		<u>GASEOUS</u>	
	<u>Avg %</u>	<u>Max %</u>	<u>Avg %</u>	<u>Max %</u>
Release Point Mixing	2	5	NA	NA
Sampling	1	5	2	5
Sample Preparation	1	5	1	5
Sample Analysis	3	10	3	10
Release Volume	<u>2</u>	<u>5</u>	<u>4</u>	<u>15</u>
Total %	9	30	10	35

(above values are examples only)

The predictability of error for radioactive releases can only be applied to nuclides that are predominant in sample spectrums. Nuclides that are near background relative to the predominant nuclides in a given sample could easily have errors greater than the maximums listed above.

Liquid Radioactive Effluents

Each batch release was sampled and analyzed for gamma emitting radionuclides using gamma spectroscopy prior to release. Composite samples were analyzed monthly for tritium and gross alpha radioactivity in the onsite laboratory using liquid scintillation and air ion chamber counting techniques, respectively. Composite samples were analyzed quarterly for Strontium-89 (Sr-89), Strontium-90 (Sr-90), Iron-55 (Fe-55), Nickel-63 (Ni-63), and C-14 by a contract laboratory. The results of the composite analyses from the previous month or quarter were used to estimate the quantities of these radionuclides in liquid effluents during the current month or quarter. The total radioactivity in liquid effluent releases was determined from the measured and estimated concentrations of each radionuclide present and the total volume of the effluent released during periods of discharge.

Gaseous Radioactive Effluents

Each gaseous batch was sampled and analyzed for radioactivity prior to release. For releases from gas decay tanks, noble gas grab samples were analyzed for gamma emitting radionuclides using gamma spectroscopy. For releases from the reactor containment buildings, samples were taken of noble gas and tritium grab samples and analyzed for gamma emitting radionuclides prior to each release. The results of the analyses and the total volume of effluent released were used to determine the total amount of radioactivity released in the batch mode.

For continuous effluent release pathways, noble gas and tritium grab samples were collected and analyzed weekly for gamma emitting radionuclides by gamma spectroscopy and liquid scintillation counting techniques, respectively. Continuous release pathways were continuously sampled using radioiodine absorbers and particulate filters. The radioiodine absorbers and particulate filters were analyzed weekly for gamma emitting radionuclides using gamma spectroscopy. Results of the noble gas and tritium grab samples, radioiodine absorber, and particulate filter analyses from the current week along with the average effluent flow rate for the previous week were used to determine the total amount of radioactivity released in the continuous mode. The particulate filters were analyzed weekly for gross alpha activity in the onsite laboratory using the air ion chamber counting technique. Quarterly composites of particulate filters were analyzed for Sr-89 and Sr-90 by a contract laboratory.

Meteorological Monitoring Program

In accordance with ODCM Administrative Control 3.11.2.6.b., a summary of hourly meteorological data collected during 2021 is retained onsite. This data is available for review by the NRC upon request. During 2021, the goal of 90% joint data recovery was met. Actual meteorological data

collected during the year was used for the offsite dose calculations in this report.

Carbon-14 Dose Estimation

The estimate of C-14 released from the St. Lucie Nuclear Plant was derived from the EPRI document, "Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents", Report 1021106, issued December 2010.

The Site-specific source term values used in the St. Lucie calculations were taken from the PWR Section, Page 4-28 of the report, and employed the proxy generation rate values for a Combustion Engineering reactor. The actual 2021 operating data for the units was employed for the calculations to derive the total curies released for each unit.

The total amount of C-14 released in 2021 from Unit 1 was 10.20 Ci, and the total amount of C-14 released in 2021 from Unit 2 was 10.32 Ci.

Per Regulatory Guide 1.21, Rev 2, Section 5.7, "Real exposure pathways are identified for routine discharges and direct radiation based on the results of the Land Use Census. Dose calculations should typically be performed based on real exposure pathways". Because the 2021 Land Use Census did not identify any land within 5 miles of Site that met the criteria of a garden per Technical Specification 3.12.2 listed in the ODCM, the highest dose exposure pathway from C-14 was calculated from the collection of citrus fruit at an orchard at a distance of 5 miles in the West sector. A "Child" consuming citrus produced at the orchard located 5 miles in the West direction from Site would have received a total combined "Bone Dose" of $5.68E-2$ mrem attributed to C-14.

Assessment of radiation dose from radioactive effluents to a MEMBER OF THE PUBLIC due to activities inside the Site boundary assumes the visitor to be a Lifeguard at Walton Rocks Beach Recreation Area, located 1 mile southeast of the site. Dose to the visitor on Site for calendar year 2021 was calculated to be $4.75E-09$ mrem Total Body dose. See Section 3.4, Dose Assessments, for more detail.

Radiation dose from radioactive effluents to a MEMBER OF THE PUBLIC due to activities inside the Site boundary is a fraction of the 1 mrem annual whole-body dose received by the average US citizen from natural occurring C-14, primarily generated through cosmogenesis in the terrestrial biosphere (Reference: National Council of Radiation Protection Report 45, Natural Background Radiation in the United States).

All C-14 dose calculations are based on Regulatory Guide 1.109 values.

2.0 SUPPLEMENTAL INFORMATION

2.1 Abnormal Releases or Abnormal Discharges

No abnormal (unplanned) releases or discharges occurred during the report period.

2.2 Non-Routine Planned Discharges

No non-routine planned discharges occurred during the report period.

2.3 Radioactive Waste Treatment System Changes

No changes were made to the Radioactive Waste Treatment System during the report period.

2.4 Annual Land Use Census Changes

During 2021, no garden greater than 500 ft² was located within 5 miles of Site. Per Technical Specification 3.12.2 listed in the ODCM, C-200, Page 64, broad leaf vegetation (Brazilian Pepper) sampling was performed at the Site Boundary in the 2 sectors (WNW and NW) with the highest predicted D/Qs in lieu of the garden census. Controls for broad leaf vegetation sampling per ODCM Table 3.12-1, Part 4.b, including collection and analysis of control samples, were followed.

2.5 Effluent Monitoring System Inoperability

One effluent radiation monitor was out of service for greater than 30 days during the report period:

- RM-45-1, Steam Generator Blowdown Treatment Facility (SGBTF) Vent Rad Monitor was non-functional and declared out of service on 8/23/2021 due to particulate filter high pressure. As per the Offsite Dose Calculation Manual (ODCM), Table 3.3-13, no actions are required if SGBTF ventilation is secured. In the event SGBTF ventilation were to be placed in service, ODCM, Table 3.3-13 provides actions required to be performed. SGBTF ventilation fans are currently off. The SGBTF Rad Monitor is currently not in service.

2.6 Offsite Dose Calculation Manual Changes

No changes were made to the Offsite Dose Calculation Manual during the report period.

2.7 Process Control Program Changes

No changes were made to the Process Control Program during the report period.

2.8 Corrections to Previous Reports

The 2020 Annual Radioactive Effluent Release Report (L-2021-049) was found to contain an error related to the amount of tritium reported in liquid releases for the third and fourth quarters. Further investigation revealed and corrected two additional errors with gaseous release permits being closed on the wrong date, making it appear that the releases were 24 hours longer (i.e., greater) than actual. L-2021-049, Enclosure 1, Table 3.1, Gaseous Effluents and Liquid Effluents, and Table 3.3, Dose Assessments were corrected and submitted to the Nuclear Regulatory Commission in Letter L-2021-225 dated December 14, 2021.

2.9 Other

AR 2381903 LOSS OF PRESSURE IN 2C Gas Decay Tank (GDT)

When 2C GDT was placed in service, pressure in the tank dropped from 13 psig to 8 psig. Crew decided to press up the 2C GDT to above 10 psig and swap to the 2A GDT, following a gaseous release of 2A GDT. During the 2A GDT release, 2C GDT pressure dropped to 6 psig, when it was then removed from service. 2A GDT was NOT dropping pressure (once isolated from the release). Per the ODCM, an unplanned release is defined for GDTs as: If a GDT loses greater than 2 psig per 8 hours for 9 consecutive shifts, or 18 psig in 72 hours, AND the losses were determined to be to the Reactor Auxiliary Building Atmosphere, then you must declare the losses an unplanned release. In this case, the C GDT lost a total of 9 psig in the span of 12 hours and was then removed from service, and therefore does not meet the definition of an unplanned release.

AR 2391141 X-5 LIQUID RADWASTE RADIATION MONITOR FLOW LOW ALARM

Equipment Name: Unit 1 RADIATION DETECTOR FOR LIQUID
MONITOR CHANNEL 43

Location Description: CCW/26/N-957/E-1731

Equipment Tag: RE-6627

When attempting to perform a release of "A" Waste Monitor Tank per 1-NOP- 06.01, X-5 Liquid Radwaste Rad Monitor Flow Low alarm locked in. Operations declared RE-6627 Liquid Waste Discharge Radiation Monitor out of service. Release was stopped, and Chemistry performed additional grab sample of A WMT to allow for release with RE-6627 out of service. Compensatory measures implemented: With the Radiation Monitor non-functional, liquid releases can be conducted provided two (2) independent samples are analyzed and two (2) qualified individuals validate the release rate calculation.

AR 2396014 DRAWINGS NEED UPDATED FOR CHANGES MADE TO UNIT 1 GAS ANALYZER

Equipment Name: Unit 1 Waste Gas Decay Tank Oxygen Analyzer
 Location Description: RAB/19.5/N-RA3/E-RAH - AUTO GAS ANALYZER
 I&C performed modifications on the Unit 1 Gas Analyzers for O2Y-6601 and O2Y-6602 to remove piping and pumps and left only the piping from the 1A, 1B, and 1C Gas Decay Tanks (GDTs). PCR 2389176 was generated to change procedure 1-NOP-06.23 to allow for alignment of the GDTs to the waste gas analyzer; however, it does not appear the associated plant drawings were changed. 8770-3089 and 8770-G-078 SHT 164 need to be updated for these changes. The required compensatory measures are in effect. Compensatory measures implemented: Chemistry once-per-24-hour grab sampling.

South Pond Settling Basin Release Summary

Seventeen batch releases from the South Settling Basin to the Intake Canal to lower the water level due to periods of higher than normal rainfall occurred during the report period. All releases were analyzed according to the ODCM and Site procedural requirements and were found to have no detectable gamma, tritium, alpha, or hard-to-detect isotopes. The releases are summarized below.

2021 South Pond Releases				
#	Sample Date	Permit #	Volume (Gallons)	Quarter
1	1/12/21	L-21-056-B	1,926,930	Q1
2	2/9/21	L-21-065-B	4,248,114	
3	3/18/21	L-21-084-B	2,622,517	
4	4/10/21	L-21-085-B	2,679,997	Q2
5	5/5/21	L-21-105-B	2,109,765	
6	6/4/21	L-21-106-B	1,681,699	
7	6/16/21	L-21-109-B	6,495,301	
8	6/24/21	L-21-111-B	754,551	
9	7/1/21	L-21-115-B	154,381	Q3
10	8/5/21	L-21-132-B	7,209,746	
11	8/12/21	L-21-133-B	2,954,550	
12	8/29/21	L-21-137-B	7,480,000	
13	9/9/21	L-21-138-B	3,940,000	
14	9/20/21	L-21-144-B	2,623,830	
15	11/12/21	L-21-146-B	2,455,064	Q4
16	11/22/21	L-21-147-B	1,700,292	
17	12/18/21	L-21-001-B	3,416,128	

3.0 TABLES

3.1 Gaseous Effluents and Liquid Effluents

3.2 Solid Waste Storage and Shipments

3.3 Dose Assessments

3.4 Visitor Dose

L-2022-023
Enclosure

TABLE 3.1
GASEOUS EFFLUENTS AND LIQUID EFFLUENTS
(26 PAGES)

Reg. Guide 1.21, Table 5A and 5B - Liquid and Gas Batch Release Summary

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

A. Liquid Batch Release Totals	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Totals
1. Number of Batch Releases		20	35	29	8	92
2. Total duration of batch releases	min	3.51E+04	5.55E+04	6.21E+04	2.33E+04	1.76E+05
3. Maximum batch release duration	min	8.64E+03	8.63E+03	8.88E+03	8.66E+03	8.88E+03
4. Average batch release duration	min	1.75E+03	1.59E+03	2.14E+03	2.91E+03	1.91E+03
5. Minimum batch release duration	min	3.77E+02	5.09E+02	4.45E+02	7.48E+02	3.77E+02
B. Gas Batch Release Totals	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Totals
1. Number of Batch Releases		58	68	75	54	255
2. Total duration of batch releases	min	1.98E+04	7.42E+04	7.33E+04	1.85E+04	1.86E+05
3. Maximum batch release duration	min	1.59E+03	1.98E+04	1.03E+04	6.00E+02	1.98E+04
4. Average batch release duration	min	3.41E+02	1.09E+03	9.77E+02	3.42E+02	7.29E+02
5. Minimum batch release duration	min	2.50E+01	1.70E+01	2.20E+01	4.00E+01	1.70E+01

Reg. Guide 1.21, Table 6A and 6B - Liquid and Gas Abnormal Release Summary

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

A. Liquid Abnormal Release Totals	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Totals
1. Number of Abnormal Releases		0	0	0	0	0
2. Total Activity of abnormal releases	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B. Gas Abnormal Release Totals	Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Totals
1. Number of Abnormal Releases		0	0	0	0	0
2. Total Activity of abnormal releases	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Reg. Guide 1.21, Table 1A, Gaseous Effluents - Summation of All Releases

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Total Release	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual	Uncertainty
A. Fission and Activation Gases							
1. Total Release	Ci	6.66E-01	1.73E+00	3.87E+00	1.03E+01	1.66E+01	
2. Average Release Rate for Period	uCi/s	8.56E-02	2.19E-01	4.87E-01	1.30E+00	5.27E-01	
3. Percent of Limit	%						
B. Iodines and Halogens							
1. Total Release	Ci	1.02E-05	2.59E-05	1.23E-06	0.00E+00	3.73E-05	
2. Average Release Rate for Period	uCi/s	1.31E-06	3.30E-06	1.54E-07	0.00E+00	1.18E-06	
3. Percent of Limit	%						
C. Particulates							
1. Total Release	Ci	0.00E+00	1.16E-07	1.37E-06	0.00E+00	1.49E-06	
2. Average Release Rate for Period	uCi/s	0.00E+00	1.47E-08	1.72E-07	0.00E+00	4.71E-08	
3. Percent of Limit	%						
D. Tritium							
1. Total Release	Ci	8.57E-01	5.45E+00	3.54E+00	1.90E+00	1.18E+01	
2. Average Release Rate for Period	uCi/s	1.10E-01	6.93E-01	4.46E-01	2.39E-01	3.73E-01	
3. Percent of Limit	%						
E. Gross Alpha							
1. Total Release	Ci	0.00E+00	3.19E-08	2.18E-09	4.83E-09	3.89E-08	
F. Carbon-14							
1. Total Release	Ci	5.56E+00	4.51E+00	4.73E+00	5.70E+00	2.05E+01	
2. Average Release Rate for Period	uCi/s	7.15E-01	5.74E-01	5.95E-01	7.18E-01	6.50E-01	
3. Percent of Limit	%						

Reg. Guide 1.21, Table 1A, Gaseous Effluents - Summation of All Releases

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Total Release	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual	Uncertainty
A. Fission and Activation Gases							
1. Total Release	Ci	3.28E-01	4.79E-01	3.00E-01	2.85E-01	1.39E+00	
2. Average Release Rate for Period	uCi/s	4.22E-02	6.09E-02	3.78E-02	3.59E-02	4.41E-02	
3. Percent of Limit	%						
B. Iodines and Halogens							
1. Total Release	Ci	8.89E-06	2.54E-05	0.00E+00	0.00E+00	3.43E-05	
2. Average Release Rate for Period	uCi/s	1.14E-06	3.24E-06	0.00E+00	0.00E+00	1.09E-06	
3. Percent of Limit	%						
C. Particulates							
1. Total Release	Ci	0.00E+00	1.16E-07	0.00E+00	0.00E+00	1.16E-07	
2. Average Release Rate for Period	uCi/s	0.00E+00	1.47E-08	0.00E+00	0.00E+00	3.67E-09	
3. Percent of Limit	%						
D. Tritium							
1. Total Release	Ci	5.51E-01	5.32E+00	1.34E+00	1.58E+00	8.79E+00	
2. Average Release Rate for Period	uCi/s	7.08E-02	6.77E-01	1.68E-01	1.99E-01	2.79E-01	
3. Percent of Limit	%						
E. Gross Alpha							
1. Total Release	Ci	0.00E+00	3.19E-08	0.00E+00	4.83E-09	3.67E-08	
F. Carbon-14							
1. Total Release	Ci	2.83E+00	1.64E+00	2.90E+00	2.81E+00	1.02E+01	
2. Average Release Rate for Period	uCi/s	3.64E-01	2.09E-01	3.65E-01	3.54E-01	3.23E-01	
3. Percent of Limit	%						

Reg. Guide 1.21, Table 1A, Gaseous Effluents - Summation of All Releases

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Total Release	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual	Uncertainty
A. Fission and Activation Gases							
1. Total Release	Ci	3.38E-01	1.25E+00	3.57E+00	1.01E+01	1.52E+01	
2. Average Release Rate for Period	uCi/s	4.34E-02	1.59E-01	4.50E-01	1.27E+00	4.82E-01	
3. Percent of Limit	%						
B. Iodines and Halogens							
1. Total Release	Ci	1.29E-06	4.89E-07	1.23E-06	0.00E+00	3.01E-06	
2. Average Release Rate for Period	uCi/s	1.66E-07	6.22E-08	1.54E-07	0.00E+00	9.54E-08	
3. Percent of Limit	%						
C. Particulates							
1. Total Release	Ci	0.00E+00	0.00E+00	1.37E-06	0.00E+00	1.37E-06	
2. Average Release Rate for Period	uCi/s	0.00E+00	0.00E+00	1.72E-07	0.00E+00	4.35E-08	
3. Percent of Limit	%						
D. Tritium							
1. Total Release	Ci	3.07E-01	1.26E-01	2.21E+00	3.21E-01	2.96E+00	
2. Average Release Rate for Period	uCi/s	3.94E-02	1.60E-02	2.78E-01	4.04E-02	9.39E-02	
3. Percent of Limit	%						
E. Gross Alpha							
1. Total Release	Ci	0.00E+00	0.00E+00	2.18E-09	0.00E+00	2.18E-09	
F. Carbon-14							
1. Total Release	Ci	2.73E+00	2.87E+00	1.83E+00	2.89E+00	1.03E+01	
2. Average Release Rate for Period	uCi/s	3.51E-01	3.65E-01	2.30E-01	3.64E-01	3.27E-01	
3. Percent of Limit	%						

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Continuous Mode

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Continuous Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Gases						
Ar-41	Ci	0.00E+00	4.64E-01	0.00E+00	0.00E+00	4.64E-01
Kr-85m	Ci	3.82E-02	0.00E+00	0.00E+00	0.00E+00	3.82E-02
Xe-131m	Ci	0.00E+00	0.00E+00	8.05E-01	9.85E+00	1.07E+01
Xe-135	Ci	3.91E-02	1.55E-01	0.00E+00	0.00E+00	1.94E-01
Xe-135m	Ci	0.00E+00	5.47E-01	0.00E+00	0.00E+00	5.47E-01
Total For Period	Ci	7.73E-02	1.17E+00	8.05E-01	9.85E+00	1.19E+01
B. Iodines and Halogens						
I-131	Ci	1.87E-06	3.46E-06	8.67E-07	0.00E+00	6.20E-06
I-133	Ci	8.31E-06	2.25E-05	0.00E+00	0.00E+00	3.08E-05
Total For Period	Ci	1.02E-05	2.59E-05	8.67E-07	0.00E+00	3.70E-05
C. Particulates						
Cr-51	Ci	0.00E+00	0.00E+00	5.09E-07	0.00E+00	5.09E-07
D. Tritium						
H-3	Ci	0.00E+00	0.00E+00	1.29E+00	1.45E+00	2.74E+00
E. Gross Alpha						
G-Alpha	Ci	0.00E+00	2.39E-08	2.18E-09	4.83E-09	3.09E-08
F. Carbon-14						
C-14	Ci	5.56E+00	4.51E+00	4.73E+00	5.70E+00	2.05E+01

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Batch Mode

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Gases						
Ar-41	Ci	5.05E-01	3.77E-01	2.26E+00	4.58E-01	3.60E+00
Kr-85m	Ci	5.46E-05	4.83E-06	1.58E-05	0.00E+00	7.52E-05
Kr-87	Ci	0.00E+00	0.00E+00	1.23E-04	0.00E+00	1.23E-04
Kr-88	Ci	0.00E+00	0.00E+00	1.36E-04	1.17E-04	2.54E-04
Kr-89	Ci	1.82E-02	0.00E+00	0.00E+00	0.00E+00	1.82E-02
Xe-127	Ci	0.00E+00	4.25E-05	2.23E-05	0.00E+00	6.48E-05
Xe-131m	Ci	0.00E+00	0.00E+00	1.67E-04	0.00E+00	1.67E-04
Xe-133m	Ci	0.00E+00	1.15E-03	2.07E-04	0.00E+00	1.36E-03
Xe-135	Ci	1.80E-03	1.98E-02	1.15E-03	1.20E-03	2.39E-02
Xe-133	Ci	6.25E-02	1.62E-01	8.10E-01	3.44E-02	1.07E+00
Xe-135m	Ci	2.58E-04	0.00E+00	0.00E+00	0.00E+00	2.58E-04
Xe-138	Ci	3.95E-04	0.00E+00	3.66E-05	0.00E+00	4.31E-04
Total For Period	Ci	5.89E-01	5.60E-01	3.07E+00	4.94E-01	4.71E+00
B. Iodines and Halogens						
I-131	Ci	0.00E+00	0.00E+00	2.16E-07	0.00E+00	2.16E-07
I-133	Ci	0.00E+00	0.00E+00	1.44E-07	0.00E+00	1.44E-07
Total For Period	Ci	0.00E+00	0.00E+00	3.60E-07	0.00E+00	3.60E-07
C. Particulates						
Co-60	Ci	0.00E+00	0.00E+00	2.95E-07	0.00E+00	2.95E-07
Zn-65	Ci	0.00E+00	0.00E+00	3.93E-07	0.00E+00	3.93E-07
Nb-95	Ci	0.00E+00	1.16E-07	1.73E-07	0.00E+00	2.89E-07
Total For Period	Ci	0.00E+00	1.16E-07	8.61E-07	0.00E+00	9.77E-07

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Batch Mode

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
D. Tritium						
H-3	Ci	8.57E-01	5.45E+00	2.26E+00	4.50E-01	9.01E+00
E. Gross Alpha						
G-Alpha	Ci	0.00E+00	8.01E-09	0.00E+00	0.00E+00	8.01E-09
F. Carbon-14						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Continuous Mode

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Continuous Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Gases						
Xe-135	Ci	0.00E+00	1.55E-01	0.00E+00	0.00E+00	1.55E-01
B. Iodines and Halogens						
I-131	Ci	5.81E-07	2.97E-06	0.00E+00	0.00E+00	3.55E-06
I-133	Ci	8.31E-06	2.25E-05	0.00E+00	0.00E+00	3.08E-05
Total For Period	Ci	8.89E-06	2.54E-05	0.00E+00	0.00E+00	3.43E-05
C. Particulates						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
D. Tritium						
H-3	Ci	0.00E+00	0.00E+00	1.15E+00	1.30E+00	2.45E+00
E. Gross Alpha						
G-Alpha	Ci	0.00E+00	2.39E-08	0.00E+00	4.83E-09	2.87E-08
F. Carbon-14						
C-14	Ci	2.83E+00	1.64E+00	2.90E+00	2.81E+00	1.02E+01

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Batch Mode

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Gases						
Ar-41	Ci	2.92E-01	1.68E-01	2.77E-01	2.73E-01	1.01E+00
Kr-87	Ci	0.00E+00	0.00E+00	1.23E-04	0.00E+00	1.23E-04
Kr-88	Ci	0.00E+00	0.00E+00	1.36E-04	1.17E-04	2.54E-04
Kr-89	Ci	1.82E-02	0.00E+00	0.00E+00	0.00E+00	1.82E-02
Xe-127	Ci	0.00E+00	4.25E-05	0.00E+00	0.00E+00	4.25E-05
Xe-135	Ci	1.56E-04	1.91E-02	1.46E-04	4.23E-05	1.94E-02
Xe-133m	Ci	0.00E+00	1.15E-03	0.00E+00	0.00E+00	1.15E-03
Xe-133	Ci	1.75E-02	1.36E-01	2.25E-02	1.20E-02	1.88E-01
Xe-135m	Ci	2.58E-04	0.00E+00	0.00E+00	0.00E+00	2.58E-04
Xe-138	Ci	3.95E-04	0.00E+00	0.00E+00	0.00E+00	3.95E-04
Total For Period	Ci	3.28E-01	3.24E-01	3.00E-01	2.85E-01	1.24E+00
B. Iodines and Halogens						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C. Particulates						
Nb-95	Ci	0.00E+00	1.16E-07	0.00E+00	0.00E+00	1.16E-07
D. Tritium						
H-3	Ci	5.51E-01	5.32E+00	1.85E-01	2.78E-01	6.34E+00
E. Gross Alpha						
G-Alpha	Ci	0.00E+00	8.01E-09	0.00E+00	0.00E+00	8.01E-09

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Batch Mode

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
F. Carbon-14						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Continuous Mode

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Continuous Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Gases						
Ar-41	Ci	0.00E+00	4.64E-01	0.00E+00	0.00E+00	4.64E-01
Kr-85m	Ci	3.82E-02	0.00E+00	0.00E+00	0.00E+00	3.82E-02
Xe-131m	Ci	0.00E+00	0.00E+00	8.05E-01	9.85E+00	1.07E+01
Xe-135	Ci	3.91E-02	0.00E+00	0.00E+00	0.00E+00	3.91E-02
Xe-135m	Ci	0.00E+00	5.47E-01	0.00E+00	0.00E+00	5.47E-01
Total For Period	Ci	7.73E-02	1.01E+00	8.05E-01	9.85E+00	1.17E+01
B. Iodines and Halogens						
I-131	Ci	1.29E-06	4.89E-07	8.67E-07	0.00E+00	2.65E-06
C. Particulates						
Cr-51	Ci	0.00E+00	0.00E+00	5.09E-07	0.00E+00	5.09E-07
D. Tritium						
H-3	Ci	0.00E+00	0.00E+00	1.34E-01	1.49E-01	2.83E-01
E. Gross Alpha						
G-Alpha	Ci	0.00E+00	0.00E+00	2.18E-09	0.00E+00	2.18E-09
F. Carbon-14						
C-14	Ci	2.73E+00	2.87E+00	1.83E+00	2.89E+00	1.03E+01

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Batch Mode

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Gases						
Ar-41	Ci	2.14E-01	2.09E-01	1.98E+00	1.85E-01	2.59E+00
Kr-85m	Ci	5.46E-05	4.83E-06	1.58E-05	0.00E+00	7.52E-05
Xe-127	Ci	0.00E+00	0.00E+00	2.23E-05	0.00E+00	2.23E-05
Xe-131m	Ci	0.00E+00	0.00E+00	1.67E-04	0.00E+00	1.67E-04
Xe-133m	Ci	0.00E+00	0.00E+00	2.07E-04	0.00E+00	2.07E-04
Xe-135	Ci	1.64E-03	7.07E-04	1.00E-03	1.16E-03	4.51E-03
Xe-133	Ci	4.50E-02	2.64E-02	7.88E-01	2.24E-02	8.82E-01
Xe-138	Ci	0.00E+00	0.00E+00	3.66E-05	0.00E+00	3.66E-05
Total For Period	Ci	2.60E-01	2.36E-01	2.77E+00	2.09E-01	3.47E+00
B. Iodines and Halogens						
I-131	Ci	0.00E+00	0.00E+00	2.16E-07	0.00E+00	2.16E-07
I-133	Ci	0.00E+00	0.00E+00	1.44E-07	0.00E+00	1.44E-07
Total For Period	Ci	0.00E+00	0.00E+00	3.60E-07	0.00E+00	3.60E-07
C. Particulates						
Co-60	Ci	0.00E+00	0.00E+00	2.95E-07	0.00E+00	2.95E-07
Zn-65	Ci	0.00E+00	0.00E+00	3.93E-07	0.00E+00	3.93E-07
Nb-95	Ci	0.00E+00	0.00E+00	1.73E-07	0.00E+00	1.73E-07
Total For Period	Ci	0.00E+00	0.00E+00	8.61E-07	0.00E+00	8.61E-07
D. Tritium						
H-3	Ci	3.07E-01	1.26E-01	2.07E+00	1.72E-01	2.68E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 1B, Gaseous Effluents - Ground Level Release - Batch Mode

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
E. Gross Alpha						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F. Carbon-14						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2A, Liquid Effluents - Summation of All Releases

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Total Release	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual	Uncertainty
A. Fission and Activation Products							
1. Total Release	Ci	1.56E-02	1.39E-02	1.41E-02	3.35E-03	4.69E-02	
2. Average Concentration	uCi/mL	1.17E-10	7.00E-11	8.93E-11	4.36E-11	8.28E-11	
3. Percent of Limit	%						
B. Tritium							
1. Total Release	Ci	3.47E+02	2.78E+02	1.61E+02	2.16E+01	8.08E+02	
2. Average Concentration	uCi/mL	2.60E-06	1.40E-06	1.02E-06	2.81E-07	1.42E-06	
3. Percent of Limit	%						
C. Dissolved and Entrained Gases							
1. Total Release	Ci	7.15E-04	8.47E-03	9.04E-03	6.49E-05	1.83E-02	
2. Average Concentration	uCi/mL	5.35E-12	4.26E-11	5.74E-11	8.43E-13	3.23E-11	
3. Percent of Limit	%						
D. Gross Alpha Activity							
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average Concentration	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
E. Primary Liquid Release Volume							
1. Total Release	Liters	3.49E+07	5.49E+07	9.45E+07	2.92E+07	2.14E+08	
F. Dilution Volume							
1. Total Release	Liters	1.34E+11	1.99E+11	1.58E+11	7.69E+10	5.67E+11	

Reg. Guide 1.21, Table 2A, Liquid Effluents - Summation of All Releases

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Total Release	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual	Uncertainty
A. Fission and Activation Products							
1. Total Release	Ci	7.80E-03	6.96E-03	7.04E-03	1.68E-03	2.35E-02	
2. Average Concentration	uCi/mL	1.17E-10	7.00E-11	8.93E-11	4.36E-11	8.28E-11	
3. Percent of Limit	%						
B. Tritium							
1. Total Release	Ci	1.73E+02	1.39E+02	8.06E+01	1.08E+01	4.04E+02	
2. Average Concentration	uCi/mL	2.60E-06	1.40E-06	1.02E-06	2.81E-07	1.42E-06	
3. Percent of Limit	%						
C. Dissolved and Entrained Gases							
1. Total Release	Ci	3.57E-04	4.23E-03	4.52E-03	3.24E-05	9.15E-03	
2. Average Concentration	uCi/mL	5.35E-12	4.26E-11	5.74E-11	8.43E-13	3.23E-11	
3. Percent of Limit	%						
D. Gross Alpha Activity							
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average Concentration	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
E. Primary Liquid Release Volume							
1. Total Release	Liters	1.74E+07	2.75E+07	4.73E+07	1.46E+07	1.07E+08	
F. Dilution Volume							
1. Total Release	Liters	6.68E+10	9.94E+10	7.88E+10	3.85E+10	2.84E+11	

Reg. Guide 1.21, Table 2A, Liquid Effluents - Summation of All Releases

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Total Release	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual	Uncertainty
A. Fission and Activation Products							
1. Total Release	Ci	7.80E-03	6.96E-03	7.04E-03	1.68E-03	2.35E-02	
2. Average Concentration	uCi/mL	1.17E-10	7.00E-11	8.93E-11	4.36E-11	8.28E-11	
3. Percent of Limit	%						
B. Tritium							
1. Total Release	Ci	1.73E+02	1.39E+02	8.06E+01	1.08E+01	4.04E+02	
2. Average Concentration	uCi/mL	2.60E-06	1.40E-06	1.02E-06	2.81E-07	1.42E-06	
3. Percent of Limit	%						
C. Dissolved and Entrained Gases							
1. Total Release	Ci	3.57E-04	4.23E-03	4.52E-03	3.24E-05	9.15E-03	
2. Average Concentration	uCi/mL	5.35E-12	4.26E-11	5.74E-11	8.43E-13	3.23E-11	
3. Percent of Limit	%						
D. Gross Alpha Activity							
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average Concentration	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
E. Primary Liquid Release Volume							
1. Total Release	Liters	1.74E+07	2.75E+07	4.73E+07	1.46E+07	1.07E+08	
F. Dilution Volume							
1. Total Release	Liters	6.68E+10	9.94E+10	7.88E+10	3.85E+10	2.84E+11	

Reg. Guide 1.21, Table 2B, Liquid Effluents - Continuous Mode

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Continuous Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Products						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B. Tritium						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C. Dissolved and Entrained Gases						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
D. Gross Alpha Activity						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Batch Mode

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Products						
C-14	Ci	7.44E-03	3.28E-03	2.76E-03	6.81E-04	1.42E-02
Na-24	Ci	8.89E-06	5.16E-05	3.87E-05	3.33E-06	1.03E-04
Be-7	Ci	0.00E+00	1.58E-04	2.66E-05	0.00E+00	1.85E-04
Cr-51	Ci	8.71E-05	5.50E-05	7.05E-04	1.77E-04	1.02E-03
Mn-54	Ci	3.91E-05	2.74E-04	2.39E-04	3.78E-05	5.90E-04
Fe-59	Ci	9.56E-06	0.00E+00	1.45E-04	0.00E+00	1.54E-04
Co-58	Ci	6.06E-04	2.61E-03	1.51E-03	1.15E-03	5.88E-03
Co-60	Ci	1.50E-03	2.53E-03	2.21E-03	5.96E-04	6.84E-03
Ni-63	Ci	1.83E-03	9.60E-04	6.56E-04	3.62E-04	3.81E-03
Ni-65	Ci	0.00E+00	1.76E-05	0.00E+00	0.00E+00	1.76E-05
Zn-65	Ci	1.25E-05	1.50E-04	1.01E-04	0.00E+00	2.64E-04
Sr-91	Ci	4.15E-06	0.00E+00	0.00E+00	0.00E+00	4.15E-06
Y-92	Ci	0.00E+00	0.00E+00	7.43E-05	0.00E+00	7.43E-05
Zr-95	Ci	2.24E-05	4.57E-06	6.21E-04	4.13E-05	6.90E-04
Nb-95	Ci	5.94E-05	8.86E-05	1.05E-03	6.74E-05	1.26E-03
Nb-97	Ci	3.00E-04	1.75E-04	4.95E-04	4.95E-05	1.02E-03
Ru-103	Ci	5.63E-06	0.00E+00	0.00E+00	0.00E+00	5.63E-06
Ag-110m	Ci	1.37E-04	1.65E-04	4.25E-04	4.51E-05	7.72E-04
Sb-124	Ci	3.82E-04	1.59E-03	1.00E-03	5.45E-05	3.03E-03
Sb-122	Ci	0.00E+00	5.45E-05	0.00E+00	0.00E+00	5.45E-05
Sb-125	Ci	3.01E-03	1.40E-03	9.48E-04	7.05E-05	5.43E-03
Te-123m	Ci	4.87E-06	6.96E-05	0.00E+00	0.00E+00	7.45E-05
Te-129m	Ci	0.00E+00	0.00E+00	7.82E-04	0.00E+00	7.82E-04
Te-132	Ci	0.00E+00	1.16E-04	0.00E+00	0.00E+00	1.16E-04
I-131	Ci	0.00E+00	2.18E-06	0.00E+00	0.00E+00	2.18E-06
I-132	Ci	0.00E+00	1.19E-04	0.00E+00	0.00E+00	1.19E-04

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Batch Mode

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Cs-137	Ci	1.37E-04	4.02E-05	0.00E+00	1.32E-05	1.90E-04
La-140	Ci	0.00E+00	0.00E+00	2.75E-04	0.00E+00	2.75E-04
W-187	Ci	0.00E+00	0.00E+00	1.19E-05	0.00E+00	1.19E-05
Total For Period	Ci	1.56E-02	1.39E-02	1.41E-02	3.35E-03	4.69E-02
B. Tritium						
H-3	Ci	3.47E+02	2.78E+02	1.61E+02	2.16E+01	8.08E+02
C. Dissolved and Entrained Gases						
Ar-41	Ci	0.00E+00	1.48E-04	0.00E+00	0.00E+00	1.48E-04
Kr-85m	Ci	0.00E+00	3.25E-06	0.00E+00	0.00E+00	3.25E-06
Kr-88	Ci	0.00E+00	8.82E-06	0.00E+00	0.00E+00	8.82E-06
Xe-131m	Ci	0.00E+00	0.00E+00	5.75E-05	0.00E+00	5.75E-05
Xe-135	Ci	0.00E+00	4.51E-05	4.34E-06	2.50E-06	5.19E-05
Xe-133m	Ci	0.00E+00	9.48E-05	5.19E-05	0.00E+00	1.47E-04
Xe-133	Ci	7.15E-04	8.17E-03	8.93E-03	6.24E-05	1.79E-02
Total For Period	Ci	7.15E-04	8.47E-03	9.04E-03	6.49E-05	1.83E-02
D. Gross Alpha Activity						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Continuous Mode

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Continuous Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Products						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B. Tritium						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C. Dissolved and Entrained Gases						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
D. Gross Alpha Activity						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Batch Mode

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Products						
C-14	Ci	3.72E-03	1.64E-03	1.38E-03	3.41E-04	7.08E-03
Na-24	Ci	4.44E-06	2.58E-05	1.94E-05	1.66E-06	5.13E-05
Be-7	Ci	0.00E+00	7.91E-05	1.33E-05	0.00E+00	9.24E-05
Cr-51	Ci	4.36E-05	2.75E-05	3.53E-04	8.84E-05	5.12E-04
Mn-54	Ci	1.96E-05	1.37E-04	1.19E-04	1.89E-05	2.95E-04
Fe-59	Ci	4.78E-06	0.00E+00	7.24E-05	0.00E+00	7.72E-05
Co-58	Ci	3.03E-04	1.31E-03	7.56E-04	5.77E-04	2.94E-03
Co-60	Ci	7.50E-04	1.27E-03	1.10E-03	2.98E-04	3.42E-03
Ni-63	Ci	9.17E-04	4.80E-04	3.28E-04	1.81E-04	1.91E-03
Ni-65	Ci	0.00E+00	8.82E-06	0.00E+00	0.00E+00	8.82E-06
Zn-65	Ci	6.27E-06	7.49E-05	5.06E-05	0.00E+00	1.32E-04
Sr-91	Ci	2.07E-06	0.00E+00	0.00E+00	0.00E+00	2.07E-06
Y-92	Ci	0.00E+00	0.00E+00	3.71E-05	0.00E+00	3.71E-05
Zr-95	Ci	1.12E-05	2.28E-06	3.11E-04	2.07E-05	3.45E-04
Nb-95	Ci	2.97E-05	4.43E-05	5.23E-04	3.37E-05	6.31E-04
Nb-97	Ci	1.50E-04	8.73E-05	2.47E-04	2.48E-05	5.10E-04
Ru-103	Ci	2.82E-06	0.00E+00	0.00E+00	0.00E+00	2.82E-06
Ag-110m	Ci	6.83E-05	8.26E-05	2.12E-04	2.26E-05	3.86E-04
Sb-124	Ci	1.91E-04	7.97E-04	5.01E-04	2.72E-05	1.52E-03
Sb-122	Ci	0.00E+00	2.72E-05	0.00E+00	0.00E+00	2.72E-05
Sb-125	Ci	1.51E-03	6.98E-04	4.74E-04	3.52E-05	2.71E-03
Te-123m	Ci	2.43E-06	3.48E-05	0.00E+00	0.00E+00	3.73E-05
Te-129m	Ci	0.00E+00	0.00E+00	3.91E-04	0.00E+00	3.91E-04
Te-132	Ci	0.00E+00	5.80E-05	0.00E+00	0.00E+00	5.80E-05
I-131	Ci	0.00E+00	1.09E-06	0.00E+00	0.00E+00	1.09E-06
I-132	Ci	0.00E+00	5.95E-05	0.00E+00	0.00E+00	5.95E-05

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Batch Mode

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Cs-137	Ci	6.85E-05	2.01E-05	0.00E+00	6.60E-06	9.52E-05
La-140	Ci	0.00E+00	0.00E+00	1.37E-04	0.00E+00	1.37E-04
W-187	Ci	0.00E+00	0.00E+00	5.96E-06	0.00E+00	5.96E-06
Total For Period	Ci	7.80E-03	6.96E-03	7.04E-03	1.68E-03	2.35E-02
B. Tritium						
H-3	Ci	1.73E+02	1.39E+02	8.06E+01	1.08E+01	4.04E+02
C. Dissolved and Entrained Gases						
Ar-41	Ci	0.00E+00	7.41E-05	0.00E+00	0.00E+00	7.41E-05
Kr-85m	Ci	0.00E+00	1.62E-06	0.00E+00	0.00E+00	1.62E-06
Kr-88	Ci	0.00E+00	4.41E-06	0.00E+00	0.00E+00	4.41E-06
Xe-131m	Ci	0.00E+00	0.00E+00	2.88E-05	0.00E+00	2.88E-05
Xe-135	Ci	0.00E+00	2.25E-05	2.17E-06	1.25E-06	2.60E-05
Xe-133m	Ci	0.00E+00	4.74E-05	2.59E-05	0.00E+00	7.33E-05
Xe-133	Ci	3.57E-04	4.08E-03	4.47E-03	3.12E-05	8.94E-03
Total For Period	Ci	3.57E-04	4.23E-03	4.52E-03	3.24E-05	9.15E-03
D. Gross Alpha Activity						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Continuous Mode

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Continuous Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Products						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B. Tritium						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C. Dissolved and Entrained Gases						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
D. Gross Alpha Activity						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Batch Mode

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
A. Fission and Activation Products						
C-14	Ci	3.72E-03	1.64E-03	1.38E-03	3.41E-04	7.08E-03
Na-24	Ci	4.44E-06	2.58E-05	1.94E-05	1.66E-06	5.13E-05
Be-7	Ci	0.00E+00	7.91E-05	1.33E-05	0.00E+00	9.24E-05
Cr-51	Ci	4.36E-05	2.75E-05	3.53E-04	8.84E-05	5.12E-04
Mn-54	Ci	1.96E-05	1.37E-04	1.19E-04	1.89E-05	2.95E-04
Fe-59	Ci	4.78E-06	0.00E+00	7.24E-05	0.00E+00	7.72E-05
Co-58	Ci	3.03E-04	1.31E-03	7.56E-04	5.77E-04	2.94E-03
Co-60	Ci	7.50E-04	1.27E-03	1.10E-03	2.98E-04	3.42E-03
Ni-63	Ci	9.17E-04	4.80E-04	3.28E-04	1.81E-04	1.91E-03
Ni-65	Ci	0.00E+00	8.82E-06	0.00E+00	0.00E+00	8.82E-06
Zn-65	Ci	6.27E-06	7.49E-05	5.06E-05	0.00E+00	1.32E-04
Sr-91	Ci	2.07E-06	0.00E+00	0.00E+00	0.00E+00	2.07E-06
Y-92	Ci	0.00E+00	0.00E+00	3.71E-05	0.00E+00	3.71E-05
Zr-95	Ci	1.12E-05	2.28E-06	3.11E-04	2.07E-05	3.45E-04
Nb-95	Ci	2.97E-05	4.43E-05	5.23E-04	3.37E-05	6.31E-04
Nb-97	Ci	1.50E-04	8.73E-05	2.47E-04	2.48E-05	5.10E-04
Ru-103	Ci	2.82E-06	0.00E+00	0.00E+00	0.00E+00	2.82E-06
Ag-110m	Ci	6.83E-05	8.26E-05	2.12E-04	2.26E-05	3.86E-04
Sb-124	Ci	1.91E-04	7.97E-04	5.01E-04	2.72E-05	1.52E-03
Sb-122	Ci	0.00E+00	2.72E-05	0.00E+00	0.00E+00	2.72E-05
Sb-125	Ci	1.51E-03	6.98E-04	4.74E-04	3.52E-05	2.71E-03
Te-123m	Ci	2.43E-06	3.48E-05	0.00E+00	0.00E+00	3.73E-05
Te-129m	Ci	0.00E+00	0.00E+00	3.91E-04	0.00E+00	3.91E-04
Te-132	Ci	0.00E+00	5.80E-05	0.00E+00	0.00E+00	5.80E-05
I-131	Ci	0.00E+00	1.09E-06	0.00E+00	0.00E+00	1.09E-06
I-132	Ci	0.00E+00	5.95E-05	0.00E+00	0.00E+00	5.95E-05

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

Reg. Guide 1.21, Table 2B, Liquid Effluents - Batch Mode

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Nuclides Released	Units	Batch Mode				
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Cs-137	Ci	6.85E-05	2.01E-05	0.00E+00	6.60E-06	9.52E-05
La-140	Ci	0.00E+00	0.00E+00	1.37E-04	0.00E+00	1.37E-04
W-187	Ci	0.00E+00	0.00E+00	5.96E-06	0.00E+00	5.96E-06
Total For Period	Ci	7.80E-03	6.96E-03	7.04E-03	1.68E-03	2.35E-02
B. Tritium						
H-3	Ci	1.73E+02	1.39E+02	8.06E+01	1.08E+01	4.04E+02
C. Dissolved and Entrained Gases						
Ar-41	Ci	0.00E+00	7.41E-05	0.00E+00	0.00E+00	7.41E-05
Kr-85m	Ci	0.00E+00	1.62E-06	0.00E+00	0.00E+00	1.62E-06
Kr-88	Ci	0.00E+00	4.41E-06	0.00E+00	0.00E+00	4.41E-06
Xe-131m	Ci	0.00E+00	0.00E+00	2.88E-05	0.00E+00	2.88E-05
Xe-135	Ci	0.00E+00	2.25E-05	2.17E-06	1.25E-06	2.60E-05
Xe-133m	Ci	0.00E+00	4.74E-05	2.59E-05	0.00E+00	7.33E-05
Xe-133	Ci	3.57E-04	4.08E-03	4.47E-03	3.12E-05	8.94E-03
Total For Period	Ci	3.57E-04	4.23E-03	4.52E-03	3.24E-05	9.15E-03
D. Gross Alpha Activity						
No Nuclides Found	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.

L-2022-023
Enclosure

TABLE 3.2
SOLID WASTE STORAGE AND SHIPMENTS
(10 PAGES)



NRC Regulatory Guide 1.21 Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Waste Class and Stream
 During Period From: 01/01/2021 to 12/31/2021

Resins, Filters, And Evaporator Bottoms			
Waste Class	Volume		Curies Shipped
	ft ³	m ³	
A	3.62E+02	1.03E+01	1.80E+01
B	1.29E+03	3.65E+01	5.88E+02
C	3.44E+01	9.74E-01	9.78E+00
Unclassified	1.54E+01	4.37E-01	8.84E+01
All	1.70E+03	4.82E+01	7.04E+02

Major Nuclides for the Above Table:

H-3, C-14, Cr-51, Mn-54, Fe-55, Co-58, Co-60, Ni-59, Ni-63, Sr-90, Zr-95, Nb-95, Tc-99, Ag-110m, Sb-125, I-129, Cs-134, Cs-137, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, Cm-243

Dry Active Waste (DAW)			
Waste Class	Volume		Curies Shipped
	ft ³	m ³	
A	3.05E+04	8.64E+02	8.15E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
Unclassified	0.00E+00	0.00E+00	0.00E+00
All	3.05E+04	8.64E+02	8.15E+00

Major Nuclides for the Above Table:

H-3, Be-7, C-14, Cr-51, Mn-54, Fe-55, Co-58, Co-60, Ni-63, Zr-95, Nb-95, Tc-99, I-129, Cs-137, Am-241, Cm-243

Irradiated Components			
Waste Class	Volume		Curies Shipped
	ft ³	m ³	
A	0.00E+00	0.00E+00	0.00E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
Unclassified	0.00E+00	0.00E+00	0.00E+00
All	0.00E+00	0.00E+00	0.00E+00

Major Nuclides for the Above Table:



NRC Regulatory Guide 1.21 Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Waste Class and Stream

During Period From: 01/01/2021 to 12/31/2021

Other Waste			
Waste Class	Volume		Curies Shipped
	ft ³	m ³	
A	0.00E+00	0.00E+00	0.00E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
Unclassified	0.00E+00	0.00E+00	0.00E+00
All	0.00E+00	0.00E+00	0.00E+00

Major Nuclides for the Above Table:

Sum of All Low-Level Waste Shipped From Site			
Waste Class	Volume		Curies Shipped
	ft ³	m ³	
A	3.09E+04	8.75E+02	2.61E+01
B	1.29E+03	3.65E+01	5.88E+02
C	3.44E+01	9.74E-01	9.78E+00
Unclassified	1.54E+01	4.37E-01	8.84E+01
All	3.22E+04	9.13E+02	7.12E+02

Major Nuclides for the Above Table:

H-3, Be-7, C-14, Cr-51, Mn-54, Fe-55, Co-58, Co-60, Ni-59, Ni-63, Sr-90, Zr-95, Nb-95, Tc-99, Ag-110m, Sb-125, I-129, Cs-134, Cs-137, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, Cm-243



NRC Regulatory Guide 1.21 Activity Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Shipment, Package, and Category

During Period From: 01/01/2021 to 12/31/2021

Percent Cutoff: 1.0%

Dry Active Waste		
Waste Class A		
Nuclide Name	Abundance	Activity (Ci)
H-3	5.94%	4.84E-01
Cr-51	2.94%	2.39E-01
Fe-55	33.33%	2.71E+00
Co-58	3.72%	3.03E-01
Co-60	38.19%	3.11E+00
Ni-63	5.77%	4.70E-01
Zr-95	2.14%	1.74E-01
Nb-95	3.93%	3.20E-01
Total Combined		
Nuclide Name	Abundance	Activity (Ci)
H-3	5.94%	4.84E-01
Cr-51	2.94%	2.39E-01
Fe-55	33.33%	2.71E+00
Co-58	3.72%	3.03E-01
Co-60	38.19%	3.11E+00
Ni-63	5.77%	4.70E-01
Zr-95	2.14%	1.74E-01
Nb-95	3.93%	3.20E-01

Resins, Filters, and Evap Bottoms		
Waste Class A		
Nuclide Name	Abundance	Activity (Ci)
H-3	5.98%	1.08E+00
C-14	1.06%	1.91E-01
Cr-51	8.51%	1.53E+00
Fe-55	16.03%	2.88E+00
Co-58	3.42%	6.16E-01
Co-60	36.23%	6.52E+00
Ni-63	4.97%	8.94E-01
Zr-95	5.21%	9.37E-01
Nb-95	9.58%	1.72E+00
Ag-110m	2.75%	4.95E-01
Cs-137	3.51%	6.32E-01



NRC Regulatory Guide 1.21 Activity Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Shipment, Package, and Category

During Period From: 01/01/2021 to 12/31/2021

Percent Cutoff: 1.0%

Waste Class B		
Nuclide Name	Abundance	Activity (Ci)
Fe-55	5.03%	2.96E+01
Co-60	15.21%	8.94E+01
Ni-63	66.34%	3.90E+02
Cs-137	11.57%	6.80E+01
Waste Class C		
Nuclide Name	Abundance	Activity (Ci)
C-14	16.02%	1.57E+00
Mn-54	1.28%	1.25E-01
Fe-55	1.99%	1.94E-01
Co-60	61.31%	6.00E+00
Ni-63	11.73%	1.15E+00
Nb-95	2.32%	2.27E-01
Ag-110m	2.54%	2.49E-01
Sb-125	1.16%	1.13E-01
Waste Class Unclassified		
Nuclide Name	Abundance	Activity (Ci)
C-14	3.04%	2.68E+00
Co-60	17.08%	1.51E+01
Ni-63	75.96%	6.71E+01
Tc-99	1.67%	1.47E+00
Cs-137	1.03%	9.06E-01
Total Combined		
Nuclide Name	Abundance	Activity (Ci)
C-14	1.11%	7.84E+00
Fe-55	4.75%	3.34E+01
Co-60	16.63%	1.17E+02
Ni-63	65.22%	4.59E+02
Cs-137	9.88%	6.95E+01



NRC Regulatory Guide 1.21 Activity Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Shipment, Package, and Category

During Period From: 01/01/2021 to 12/31/2021

Percent Cutoff: 1.0%

Sum of All 4 Categories		
Waste Class A		
Nuclide Name	Abundance	Activity (Ci)
H-3	5.97%	1.56E+00
Cr-51	6.77%	1.77E+00
Fe-55	21.42%	5.60E+00
Co-58	3.52%	9.19E-01
Co-60	36.84%	9.63E+00
Ni-63	5.22%	1.36E+00
Zr-95	4.25%	1.11E+00
Nb-95	7.82%	2.04E+00
Ag-110m	1.97%	5.16E-01
Cs-137	2.46%	6.44E-01
Waste Class B		
Nuclide Name	Abundance	Activity (Ci)
Fe-55	5.03%	2.96E+01
Co-60	15.21%	8.94E+01
Ni-63	66.34%	3.90E+02
Cs-137	11.57%	6.80E+01
Waste Class C		
Nuclide Name	Abundance	Activity (Ci)
C-14	16.02%	1.57E+00
Mn-54	1.28%	1.25E-01
Fe-55	1.99%	1.94E-01
Co-60	61.31%	6.00E+00
Ni-63	11.73%	1.15E+00
Nb-95	2.32%	2.27E-01
Ag-110m	2.54%	2.49E-01
Sb-125	1.16%	1.13E-01
Waste Class Unclassified		
Nuclide Name	Abundance	Activity (Ci)
C-14	3.04%	2.68E+00
Co-60	17.08%	1.51E+01
Ni-63	75.96%	6.71E+01
Tc-99	1.67%	1.47E+00
Cs-137	1.03%	9.06E-01



NRC Regulatory Guide 1.21 Activity Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Shipment, Package, and Category

During Period From: 01/01/2021 to 12/31/2021

Percent Cutoff: 1.0%

Total Combined		
Nuclide Name	Abundance	Activity (Ci)
C-14	1.1%	7.85E+00
Fe-55	5.07%	3.61E+01
Co-60	16.87%	1.20E+02
Ni-63	64.54%	4.59E+02
Cs-137	9.77%	6.95E+01



Total Shipments by Carrier

Number of Shipments per each carrier

Number of Shipments	Mode of Transportation	Destination
1	Hittman Transport (TN)	Energy Solutions (DTK) Gallaher Road 628 Gallaher Road
29	Hittman Transport (TN)	EnergySolutions Bear Creek 1560 Bear Creek Road
6	Hittman Transport (TN)	Erwin ResinSolutions, LLC 151 T.C. Runion Road
1	Hittman Transport (TN)	EnergySolutions Bear Creek 1560 Bear Creek Road



Solid Waste Shipped Offsite for Disposal

During Period from: 1/1/2021 to 12/31/2021

Shipment Date	Manifest ID	Destination	Package Name	Category Name	NRC Class	DOT Type
3/17/2021	FPL/PSL 21-021	Energy Solutions Bear Creek	ESUU200604	Dry Active Waste	A	A LSA-II
			ESUU 300447	Dry Active Waste	A	A LSA-II
3/22/2021	FPL/PSL 21-022	Energy Solutions Bear Creek	ESUU200935	Other Waste	A	A LSA-II
4/6/2021	FPL/PSL 21-025	Energy Solutions Bear Creek	ESUU200572	Dry Active Waste	A	A LSA-II
			ESUU200007	Dry Active Waste	A	A LSA-II
4/16/2021	FPL/PSL 21-032	Energy Solutions Bear Creek	ESUU300168	Dry Active Waste	A	A LSA-II
			ESUU200576	Dry Active Waste	A	Exempt-Quantity
5/3/2021	FPL/PSL 21-037	Energy Solutions Bear Creek	ESUU300607	Dry Active Waste	A	A LSA-II
			ESUU200412	Dry Active Waste	A	A LSA-II
5/6/2021	FPL/PSL 21-043	Erwin Resin Solutions, LLC	PO648043-5	Resins, Filters, and Evap Bottoms	B	>A LSA-II
5/7/2021	FPL/PSL 21-044	Erwin Resin Solutions, LLC	PO636386-2	Resins, Filters, and Evap Bottoms	B	>A LSA-II
5/10/2021	FPL/PSL 21-047	Energy Solutions Bear Creek	PO640852-2	Resins, Filters, and Evap Bottoms	B	>A LSA-II
5/11/2021	FPL/PSL 21-048	Energy Solutions Bear Creek	PO661753-2	Resins, Filters, and Evap Bottoms	B	>A LSA-II
5/12/2021	FPL/PSL 21-049	Erwin Resin Solutions, LLC	PO661753-9	Resins, Filters, and Evap Bottoms	B	>A LSA-II
5/13/2021	FPL/PSL 21-050	Energy Solutions Bear Creek	PO640852-1	Resins, Filters, and Evap Bottoms	B	>A LSA-II
5/17/2021	FPL/PSL 21-045	Energy Solutions Bear Creek	ESUU600016	Other Waste	A	A LSA-II
5/26/2021	FPL/PSL 21-051	Energy Solutions Bear Creek	ESUU300507	Dry Active Waste	A	A LSA-II
			ESUU200909	Dry Active Waste	A	A LSA-II
5/26/2021	FPL/PSL 21-052	Energy Solutions Bear Creek	ESUU200661	Dry Active Waste	A	A LSA-II



Solid Waste Shipped Offsite for Disposal

During Period from: 1/1/2021 to 12/31/2021

			ESUU200533	Dry Active Waste	A	A LSA-II
6/17/2021	FPL/PSL 21-059	Erwin Resin Solutions, LLC	PO668168-13	Resins, Filters, and Evap Bottoms	B	>A LSA-II
6/30/2021	FPL/PSL 21-063	Energy Solutions, (DTK) Gallaher Road	ESUU 200660	Dry Active Waste	A	Exempt Quantity
8/25/2021	FPL/PSL 21-077	Energy Solutions Bear Creek	PO672186-4	Resins, Filters, and Evap Bottoms	A	A LSA-II
9/1/2021	FPL/PSL 21-079	Erwin Resin Solutions, LLC	PO676947-24	Resins, Filters, and Evap Bottoms	B	A LSA-II
11/3/2021	FPL/PSL 21-095	Energy Solutions Bear Creek	ESUU200522	Dry Active Waste	A	A LSA-II
			ESUU200559	Dry Active Waste	A	A LSA-II
11/5/2021	FPL/PSL 21-098	Energy Solutions Bear Creek	ESUU200406	Dry Active Waste	A	A LSA-II
			ESUU200506	Dry Active Waste	A	A LSA-II
11/5/2021	FPL/PSL 21-097	Energy Solutions Bear Creek	ESUU200629	Dry Active Waste	A	A LSA-II
			ESUU200729	Dry Active Waste	A	A LSA-I
11/12/2021	FPL/PSL 21-104	Energy Solutions Bear Creek	21-104	Dry Active Waste	A	A LSA-I
11/12/2021	FPL/PSL 21-099	Energy Solutions Bear Creek	PO698226-7	Resins, Filters, and Evap Bottoms	A	A LSA-II
11/16/2021	FPL/PSL 21-103	Energy Solutions Bear Creek	PO661753-1	Resins, Filters, and Evap Bottoms	B	A LSA-II
11/17/2021	FPL/PSL 21-100	Energy Solutions Bear Creek	PO678888-7	Resins, Filters, and Evap Bottoms	N	Type B
11/19/2021	FPL/PSL 21-105	Energy Solutions Bear Creek	PO656334-3	Resins, Filters, and Evap Bottoms	B	A LSA-II
11/23/2021	FPL/PSL 21-107	Erwin Resin Solutions, LLC	PO692512-2	Resins, Filters, and Evap Bottoms	B	>A LSA-II
12/1/2021	FPL/PSL 21-111	Energy Solutions Bear Creek	PO695587-16	Resins, Filters, and Evap Bottoms	C	A LSA-II



Solid Waste Shipped Offsite for Disposal

During Period from: 1/1/2021 to 12/31/2021

12/1/2021	FPL/PSL 21-110	Energy Solutions Bear Creek	ESUU600054	Other Waste	A	A LSA-II
12/1/2021	FPL/PSL 21-109	Energy Solutions Bear Creek	ESUU200635	Dry Active Waste	A	A LSA-II
			ESUU200450	Dry Active Waste	A	A LSA-II
12/3/2021	FPL/PSL 21-113	Energy Solutions Bear Creek	PO656976-2	Other Waste	A	A LSA-II
12/6/2021	FPL/PSL 21-114	Energy Solutions Bear Creek	PO615380-4	Resins, Filters, and Evap Bottoms	A	A LSA-II
12/8/2021	FPL/PSL 21-115	Energy Solutions Bear Creek	PO661752-4	Resins, Filters, and Evap Bottoms	A	A LSA-II
12/9/2021	FPL/PSL 21-116	Energy Solutions Bear Creek	PO687738--2	Resins, Filters, and Evap Bottoms	C	A LSA-II
12/10/2021	FPL/PSL 21-118	Energy Solutions Bear Creek	PO661752-6	Resins, Filters, and Evap Bottoms	A	A LSA-II
12/17/2021	FPL/PSL 21-121	Energy Solutions Bear Creek	PSL 128	Dry Active Waste	A	A LSA-II
			PSL 129	Dry Active Waste	A	A LSA-II
12/29/2021	FPL/PSL 21-123	Energy Solutions Bear Creek	108	Dry Active Waste	A	A LSA-II

L-2022-023
Enclosure

TABLE 3.3
DOSE ASSESSMENTS
(27 PAGES)

Reg. Guide 1.21, App B, Sec Doses due to Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Organ Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Bone	mRem	1.42E-03	1.16E-03	1.21E-03	1.46E-03	5.25E-03
Limit	mRem					
Percent of Limit	%					
Liver	mRem	1.23E-03	1.10E-03	1.10E-03	1.28E-03	4.71E-03
Limit	mRem					
Percent of Limit	%					
Total Body	mRem	1.23E-03	1.10E-03	1.10E-03	1.28E-03	4.71E-03
Limit	mRem					
Percent of Limit	%					
Thyroid	mRem	1.23E-03	1.11E-03	1.10E-03	1.28E-03	4.72E-03
Limit	mRem					
Percent of Limit	%					
Kidney	mRem	1.77E-04	1.89E-04	1.76E-04	1.91E-04	7.34E-04
Limit	mRem					
Percent of Limit	%					
Lung	mRem	1.23E-03	1.10E-03	1.10E-03	1.28E-03	4.71E-03
Limit	mRem					
Percent of Limit	%					
GI-Li	mRem	1.23E-03	1.10E-03	1.10E-03	1.28E-03	4.71E-03
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Doses due to Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

<u>Organ Dose</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>	<u>Annual</u>
Bone	mRem	7.25E-04	4.20E-04	7.43E-04	7.20E-04	2.61E-03
Limit	mRem					
Percent of Limit	%					
Liver	mRem	6.28E-04	4.73E-04	6.60E-04	6.46E-04	2.41E-03
Limit	mRem					
Percent of Limit	%					
Total Body	mRem	6.28E-04	4.73E-04	6.60E-04	6.46E-04	2.41E-03
Limit	mRem					
Percent of Limit	%					
Thyroid	mRem	6.30E-04	4.79E-04	6.60E-04	6.46E-04	2.42E-03
Limit	mRem					
Percent of Limit	%					
Kidney	mRem	9.13E-05	1.01E-04	1.01E-04	1.01E-04	3.94E-04
Limit	mRem					
Percent of Limit	%					
Lung	mRem	6.28E-04	4.73E-04	6.60E-04	6.46E-04	2.41E-03
Limit	mRem					
Percent of Limit	%					
GI-Li	mRem	6.28E-04	4.73E-04	6.60E-04	6.46E-04	2.41E-03
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Doses due to Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Organ Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Bone	mRem	6.98E-04	7.36E-04	4.68E-04	7.41E-04	2.64E-03
Limit	mRem					
Percent of Limit	%					
Liver	mRem	6.00E-04	6.27E-04	4.42E-04	6.36E-04	2.30E-03
Limit	mRem					
Percent of Limit	%					
Total Body	mRem	6.00E-04	6.27E-04	4.42E-04	6.36E-04	2.30E-03
Limit	mRem					
Percent of Limit	%					
Thyroid	mRem	6.01E-04	6.28E-04	4.42E-04	6.36E-04	2.31E-03
Limit	mRem					
Percent of Limit	%					
Kidney	mRem	8.58E-05	8.85E-05	7.50E-05	9.09E-05	3.40E-04
Limit	mRem					
Percent of Limit	%					
Lung	mRem	6.00E-04	6.27E-04	4.42E-04	6.36E-04	2.30E-03
Limit	mRem					
Percent of Limit	%					
GI-LI	mRem	6.00E-04	6.27E-04	4.42E-04	6.36E-04	2.30E-03
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Air Doses Due To Gaseous Releases

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

NG Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Gamma Air	mRad	2.62E-04	5.10E-04	1.09E-03	2.95E-04	2.15E-03
Limit	mRad					
Percent of Limit	%					
Beta Air	mRad	1.06E-04	1.91E-04	4.64E-04	6.33E-04	1.39E-03
Limit	mRad					
Percent of Limit	%					
NG Total Body	mRem	2.49E-04	4.82E-04	1.03E-03	2.52E-04	2.01E-03
Limit	mRem					
Percent of Limit	%					
NG Skin	mRem	3.75E-04	7.14E-04	1.53E-03	6.25E-04	3.25E-03
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Air Doses Due To Gaseous Releases

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

NG Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Gamma Air	mRad	1.54E-04	9.86E-05	1.31E-04	1.29E-04	5.13E-04
Limit	mRad					
Percent of Limit	%					
Beta Air	mRad	5.94E-05	5.70E-05	4.74E-05	4.61E-05	2.10E-04
Limit	mRad					
Percent of Limit	%					
NG Total Body	mRem	1.47E-04	9.33E-05	1.25E-04	1.23E-04	4.87E-04
Limit	mRem					
Percent of Limit	%					
NG Skin	mRem	2.19E-04	1.50E-04	1.83E-04	1.79E-04	7.31E-04
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Air Doses Due To Gaseous Releases

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

NG Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Gamma Air	mRad	1.08E-04	4.11E-04	9.55E-04	1.66E-04	1.64E-03
Limit	mRad					
Percent of Limit	%					
Beta Air	mRad	4.69E-05	1.34E-04	4.16E-04	5.87E-04	1.18E-03
Limit	mRad					
Percent of Limit	%					
NG Total Body	mRem	1.03E-04	3.89E-04	9.03E-04	1.29E-04	1.52E-03
Limit	mRem					
Percent of Limit	%					
NG Skin	mRem	1.55E-04	5.64E-04	1.35E-03	4.46E-04	2.52E-03
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Doses to a member of the public due to Liquid Releases

Unit: Site

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Organ Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Bone	mRem	2.27E-03	1.73E-03	1.54E-03	3.19E-04	5.85E-03
Limit	mRem					
Percent of Limit	%					
Liver	mRem	2.70E-03	3.56E-03	2.82E-03	1.90E-04	9.28E-03
Limit	mRem					
Percent of Limit	%					
Total Body	mRem	2.62E-03	2.90E-03	2.10E-03	2.20E-04	7.83E-03
Limit	mRem					
Percent of Limit	%					
Thyroid	mRem	2.31E-03	1.85E-03	1.13E-03	1.27E-04	5.41E-03
Limit	mRem					
Percent of Limit	%					
Kidney	mRem	2.76E-03	3.18E-03	2.02E-03	1.44E-04	8.11E-03
Limit	mRem					
Percent of Limit	%					
Lung	mRem	3.67E-03	2.54E-03	1.96E-03	1.52E-04	8.32E-03
Limit	mRem					
Percent of Limit	%					
GI-Li	mRem	6.49E-03	8.91E-03	4.20E-02	2.56E-03	6.00E-02
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Doses to a member of the public due to Liquid Releases

Unit: PSL1

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Organ Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Bone	mRem	1.13E-03	8.64E-04	7.68E-04	1.59E-04	2.92E-03
Limit	mRem					
Percent of Limit	%					
Liver	mRem	1.35E-03	1.78E-03	1.41E-03	9.52E-05	4.64E-03
Limit	mRem					
Percent of Limit	%					
Total Body	mRem	1.31E-03	1.45E-03	1.05E-03	1.10E-04	3.92E-03
Limit	mRem					
Percent of Limit	%					
Thyroid	mRem	1.16E-03	9.24E-04	5.63E-04	6.33E-05	2.71E-03
Limit	mRem					
Percent of Limit	%					
Kidney	mRem	1.38E-03	1.59E-03	1.01E-03	7.22E-05	4.05E-03
Limit	mRem					
Percent of Limit	%					
Lung	mRem	1.83E-03	1.27E-03	9.80E-04	7.61E-05	4.16E-03
Limit	mRem					
Percent of Limit	%					
GI-LJI	mRem	3.25E-03	4.46E-03	2.10E-02	1.28E-03	3.00E-02
Limit	mRem					
Percent of Limit	%					

Reg. Guide 1.21, App B, Sec Doses to a member of the public due to Liquid Releases

Unit: PSL2

Starting: 1-Jan-2021 Ending: 31-Dec-2021

Organ Dose	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Annual
Bone	mRem	1.13E-03	8.64E-04	7.68E-04	1.59E-04	2.92E-03
Limit	mRem					
Percent of Limit	%					
Liver	mRem	1.35E-03	1.78E-03	1.41E-03	9.52E-05	4.64E-03
Limit	mRem					
Percent of Limit	%					
Total Body	mRem	1.31E-03	1.45E-03	1.05E-03	1.10E-04	3.92E-03
Limit	mRem					
Percent of Limit	%					
Thyroid	mRem	1.16E-03	9.24E-04	5.63E-04	6.33E-05	2.71E-03
Limit	mRem					
Percent of Limit	%					
Kidney	mRem	1.38E-03	1.59E-03	1.01E-03	7.22E-05	4.05E-03
Limit	mRem					
Percent of Limit	%					
Lung	mRem	1.83E-03	1.27E-03	9.80E-04	7.61E-05	4.16E-03
Limit	mRem					
Percent of Limit	%					
GI-LI	mRem	3.25E-03	4.46E-03	2.10E-02	1.28E-03	3.00E-02
Limit	mRem					
Percent of Limit	%					

Period: Ann, 2021

Site/Unit/Discharge Point:

Site

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Xe-135	N	5.193E+01	2.432E-10	1.216E-07	9.156E-14	4.578E-11
Kr-85m	N	3.250E+00	1.522E-11	7.611E-09	5.730E-15	2.865E-12
Ar-41	N	1.481E+02	6.937E-10	3.469E-07	2.612E-13	1.306E-10
Xe-133	N	1.788E+04	8.374E-08	4.187E-05	3.152E-11	1.576E-08
Xe-131m	N	5.752E+01	2.694E-10	1.347E-07	1.014E-13	5.071E-11
Xe-133m	N	1.466E+02	6.868E-10	3.434E-07	2.585E-13	1.293E-10
Kr-88	N	8.821E+00	4.131E-11	2.066E-08	1.555E-14	7.776E-12
Nuclide Type Total		1.829E+04	8.569E-08	4.284E-05	3.226E-11	1.613E-08

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Ni-63	O	3.812E+03	1.785E-08	1.785E-05	6.721E-12	6.721E-09
H-3	O	8.076E+08	3.783E-03	3.783E-01	1.424E-06	1.424E-04
C-14	O	1.417E+04	6.637E-08	2.212E-04	2.498E-11	8.328E-08
Nuclide Type Total		8.077E+08	3.783E-03	3.785E-01	1.424E-06	1.425E-04

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Ni-65	P	1.764E+01	8.261E-11	8.261E-08	3.110E-14	3.110E-11
Sb-122	P	5.450E+01	2.553E-10	2.553E-06	9.609E-14	9.609E-10
Te-129m	P	7.818E+02	3.662E-09	5.231E-05	1.378E-12	1.969E-08
Cs-137	P	1.905E+02	8.921E-10	8.921E-05	3.358E-13	3.358E-08
Te-132	P	1.160E+02	5.431E-10	6.035E-06	2.045E-13	2.272E-09
Sb-125	P	5.426E+03	2.542E-08	8.472E-05	9.568E-12	3.189E-08
Sr-91	P	4.146E+00	1.942E-11	9.710E-08	7.311E-15	3.655E-11
Y-92	P	7.425E+01	3.478E-10	8.695E-07	1.309E-13	3.273E-10
Nb-97	P	1.019E+03	4.773E-09	1.591E-06	1.797E-12	5.989E-10
Sb-124	P	3.033E+03	1.420E-08	2.029E-04	5.347E-12	7.639E-08
W-187	P	1.191E+01	5.581E-11	1.860E-07	2.101E-14	7.003E-11
Co-58	P	5.884E+03	2.756E-08	1.378E-04	1.037E-11	5.187E-08
Be-7	P	1.848E+02	8.655E-10	0.000E+00	3.258E-13	0.000E+00
Zn-65	P	2.636E+02	1.235E-09	2.469E-05	4.648E-13	9.296E-09

Period: Ann, 2021

Site/Unit/Discharge Point:

Site

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Mn-54	P	5.897E+02	2.762E-09	9.207E-06	1.040E-12	3.466E-09
Ag-110m	P	7.719E+02	3.615E-09	6.025E-05	1.361E-12	2.268E-08
Ru-103	P	5.632E+00	2.638E-11	8.793E-08	9.931E-15	3.310E-11
Cr-51	P	1.024E+03	4.798E-09	9.596E-07	1.806E-12	3.612E-10
Fe-59	P	1.545E+02	7.234E-10	7.234E-06	2.723E-13	2.723E-09
Co-60	P	6.836E+03	3.202E-08	1.067E-03	1.205E-11	4.018E-07
Nb-95	P	1.262E+03	5.909E-09	1.970E-05	2.224E-12	7.415E-09
La-140	P	2.747E+02	1.287E-09	1.430E-05	4.844E-13	5.382E-09
Te-123m	P	7.450E+01	3.490E-10	0.000E+00	1.314E-13	0.000E+00
Na-24	P	1.026E+02	4.804E-10	9.608E-07	1.809E-13	3.617E-10
Zr-95	P	6.895E+02	3.230E-09	1.615E-05	1.216E-12	6.079E-09
Nuclide Type Total		2.885E+04	1.351E-07	1.799E-03	5.086E-11	6.773E-07

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
I-131	R	2.183E+00	1.023E-11	1.023E-06	3.850E-15	3.850E-10
I-132	R	1.190E+02	5.573E-10	5.573E-07	2.098E-13	2.098E-10
Nuclide Type Total		1.212E+02	5.675E-10	1.580E-06	2.136E-13	5.948E-10

Total		8.077E+08	3.783E-03	3.804E-01	1.424E-06	1.432E-04
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Period: Ann, 2021

Site/Unit/Discharge Point:

Site

Liquid Dose Summary - Note: All Doses in mRem

<u>Receptor</u>	<u>Agegroup</u>	<u>Bone</u>	<u>Liver</u>	<u>Total Body</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI-LIi</u>	<u>Skin</u>
Liquid Receptor - Teenager	Teenager	5.848E-03	9.281E-03	7.834E-03	5.414E-03	8.108E-03	8.323E-03	5.998E-02	0.000E+00
Liquid Receptor - Child	Child	3.553E-03	6.901E-03	6.659E-03	5.005E-03	3.538E-03	6.255E-03	2.549E-02	0.000E+00
Maximum Dose by Organ:		5.848E-03	9.281E-03	7.834E-03	5.414E-03	8.108E-03	8.323E-03	5.998E-02	0.000E+00
Maximum Organ Dose (mRem):		5.998E-02							
Maximum Total Body Dose (mRem):		7.834E-03							

Period: Ann, 2021

Site/Unit/Discharge Point:

PSL1

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Xe-135	N	2.596E+01	2.432E-10	1.216E-07	9.156E-14	4.578E-11
Kr-88	N	4.410E+00	4.131E-11	2.066E-08	1.555E-14	7.776E-12
Ar-41	N	7.406E+01	6.937E-10	3.469E-07	2.612E-13	1.306E-10
Xe-131m	N	2.876E+01	2.694E-10	1.347E-07	1.014E-13	5.071E-11
Xe-133	N	8.939E+03	8.374E-08	4.187E-05	3.152E-11	1.576E-08
Xe-133m	N	7.332E+01	6.868E-10	3.434E-07	2.585E-13	1.293E-10
Kr-85m	N	1.625E+00	1.522E-11	7.611E-09	5.730E-15	2.865E-12
Nuclide Type Total		9.147E+03	8.569E-08	4.284E-05	3.226E-11	1.613E-08

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Ni-63	O	1.906E+03	1.785E-08	1.785E-05	6.721E-12	6.721E-09
H-3	O	4.038E+08	3.783E-03	3.783E-01	1.424E-06	1.424E-04
C-14	O	7.085E+03	6.637E-08	2.212E-04	2.498E-11	8.328E-08
Nuclide Type Total		4.038E+08	3.783E-03	3.785E-01	1.424E-06	1.425E-04

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Co-60	P	3.418E+03	3.202E-08	1.067E-03	1.205E-11	4.018E-07
Be-7	P	9.239E+01	8.655E-10	0.000E+00	3.258E-13	0.000E+00
Zr-95	P	3.448E+02	3.230E-09	1.615E-05	1.216E-12	6.079E-09
Zn-65	P	1.318E+02	1.235E-09	2.469E-05	4.648E-13	9.296E-09
Cr-51	P	5.122E+02	4.798E-09	9.596E-07	1.806E-12	3.612E-10
Y-92	P	3.713E+01	3.478E-10	8.695E-07	1.309E-13	3.273E-10
Sb-124	P	1.516E+03	1.420E-08	2.029E-04	5.347E-12	7.639E-08
Ru-103	P	2.816E+00	2.638E-11	8.793E-08	9.931E-15	3.310E-11
Nb-95	P	6.308E+02	5.909E-09	1.970E-05	2.224E-12	7.415E-09
La-140	P	1.374E+02	1.287E-09	1.430E-05	4.844E-13	5.382E-09
Na-24	P	5.128E+01	4.804E-10	9.608E-07	1.809E-13	3.617E-10
Sr-91	P	2.073E+00	1.942E-11	9.710E-08	7.311E-15	3.655E-11
Ag-110m	P	3.859E+02	3.615E-09	6.025E-05	1.361E-12	2.268E-08
Cs-137	P	9.523E+01	8.921E-10	8.921E-05	3.358E-13	3.358E-08

Period: Ann, 2021

Site/Unit/Discharge Point:

PSL1

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Te-132	P	5.798E+01	5.431E-10	6.035E-06	2.045E-13	2.272E-09
Nb-97	P	5.095E+02	4.773E-09	1.591E-06	1.797E-12	5.989E-10
Sb-122	P	2.725E+01	2.553E-10	2.553E-06	9.609E-14	9.609E-10
Te-129m	P	3.909E+02	3.662E-09	5.231E-05	1.378E-12	1.969E-08
Mn-54	P	2.949E+02	2.762E-09	9.207E-06	1.040E-12	3.466E-09
Fe-59	P	7.723E+01	7.234E-10	7.234E-06	2.723E-13	2.723E-09
W-187	P	5.957E+00	5.581E-11	1.860E-07	2.101E-14	7.003E-11
Te-123m	P	3.725E+01	3.490E-10	0.000E+00	1.314E-13	0.000E+00
Sb-125	P	2.713E+03	2.542E-08	8.472E-05	9.568E-12	3.189E-08
Co-58	P	2.942E+03	2.756E-08	1.378E-04	1.037E-11	5.187E-08
Ni-65	P	8.818E+00	8.261E-11	8.261E-08	3.110E-14	3.110E-11
Nuclide Type Total		1.442E+04	1.351E-07	1.799E-03	5.086E-11	6.773E-07
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
I-131	R	1.092E+00	1.023E-11	1.023E-06	3.850E-15	3.850E-10
I-132	R	5.949E+01	5.573E-10	5.573E-07	2.098E-13	2.098E-10
Nuclide Type Total		6.058E+01	5.675E-10	1.580E-06	2.136E-13	5.948E-10
Total		4.039E+08	3.783E-03	3.804E-01	1.424E-06	1.432E-04

Period: Ann, 2021

Site/Unit/Discharge Point: PSL1

Liquid Dose Summary - Note: All Doses in mRem

<u>Receptor</u>	<u>Agegroup</u>	<u>Bone</u>	<u>Liver</u>	<u>Total Body</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI-Li</u>	<u>Skin</u>
Liquid Receptor - Teenager	Teenager	2.924E-03	4.640E-03	3.917E-03	2.707E-03	4.054E-03	4.162E-03	2.999E-02	0.000E+00
Liquid Receptor - Child	Child	1.777E-03	3.451E-03	3.329E-03	2.503E-03	1.769E-03	3.128E-03	1.274E-02	0.000E+00

Maximum Dose by Organ:	2.924E-03	4.640E-03	3.917E-03	2.707E-03	4.054E-03	4.162E-03	2.999E-02	0.000E+00
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Maximum Organ Dose (mRem): 2.999E-02

Maximum Total Body Dose (mRem): 3.917E-03

Period: Ann, 2021

Site/Unit/Discharge Point:

PSL2

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Ar-41	N	7.406E+01	6.937E-10	3.469E-07	2.612E-13	1.306E-10
Xe-133	N	8.939E+03	8.374E-08	4.187E-05	3.152E-11	1.576E-08
Kr-85m	N	1.625E+00	1.522E-11	7.611E-09	5.730E-15	2.865E-12
Kr-88	N	4.410E+00	4.131E-11	2.066E-08	1.555E-14	7.776E-12
Xe-135	N	2.596E+01	2.432E-10	1.216E-07	9.156E-14	4.578E-11
Xe-133m	N	7.332E+01	6.868E-10	3.434E-07	2.585E-13	1.293E-10
Xe-131m	N	2.876E+01	2.694E-10	1.347E-07	1.014E-13	5.071E-11
Nuclide Type Total		9.147E+03	8.569E-08	4.284E-05	3.226E-11	1.613E-08

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
H-3	O	4.038E+08	3.783E-03	3.783E-01	1.424E-06	1.424E-04
C-14	O	7.085E+03	6.637E-08	2.212E-04	2.498E-11	8.328E-08
Ni-63	O	1.906E+03	1.785E-08	1.785E-05	6.721E-12	6.721E-09
Nuclide Type Total		4.038E+08	3.783E-03	3.785E-01	1.424E-06	1.425E-04

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Co-60	P	3.418E+03	3.202E-08	1.067E-03	1.205E-11	4.018E-07
La-140	P	1.374E+02	1.287E-09	1.430E-05	4.844E-13	5.382E-09
Nb-97	P	5.095E+02	4.773E-09	1.591E-06	1.797E-12	5.989E-10
Sb-124	P	1.516E+03	1.420E-08	2.029E-04	5.347E-12	7.639E-08
Ru-103	P	2.816E+00	2.638E-11	8.793E-08	9.931E-15	3.310E-11
Cr-51	P	5.122E+02	4.798E-09	9.596E-07	1.806E-12	3.612E-10
Te-123m	P	3.725E+01	3.490E-10	0.000E+00	1.314E-13	0.000E+00
Fe-59	P	7.723E+01	7.234E-10	7.234E-06	2.723E-13	2.723E-09
Cs-137	P	9.523E+01	8.921E-10	8.921E-05	3.358E-13	3.358E-08
Te-132	P	5.798E+01	5.431E-10	6.035E-06	2.045E-13	2.272E-09
Sb-122	P	2.725E+01	2.553E-10	2.553E-06	9.609E-14	9.609E-10
Sb-125	P	2.713E+03	2.542E-08	8.472E-05	9.568E-12	3.189E-08
Na-24	P	5.128E+01	4.804E-10	9.608E-07	1.809E-13	3.617E-10
Mn-54	P	2.949E+02	2.762E-09	9.207E-06	1.040E-12	3.466E-09

Period: Ann, 2021

Site/Unit/Discharge Point:

PSL2

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
Ni-65	P	8.818E+00	8.261E-11	8.261E-08	3.110E-14	3.110E-11
Y-92	P	3.713E+01	3.478E-10	8.695E-07	1.309E-13	3.273E-10
Ag-110m	P	3.859E+02	3.615E-09	6.025E-05	1.361E-12	2.268E-08
W-187	P	5.957E+00	5.581E-11	1.860E-07	2.101E-14	7.003E-11
Zn-65	P	1.318E+02	1.235E-09	2.469E-05	4.648E-13	9.296E-09
Co-58	P	2.942E+03	2.756E-08	1.378E-04	1.037E-11	5.187E-08
Zr-95	P	3.448E+02	3.230E-09	1.615E-05	1.216E-12	6.079E-09
Nb-95	P	6.308E+02	5.909E-09	1.970E-05	2.224E-12	7.415E-09
Te-129m	P	3.909E+02	3.662E-09	5.231E-05	1.378E-12	1.969E-08
Be-7	P	9.239E+01	8.655E-10	0.000E+00	3.258E-13	0.000E+00
Sr-91	P	2.073E+00	1.942E-11	9.710E-08	7.311E-15	3.655E-11
Nuclide Type Total		1.442E+04	1.351E-07	1.799E-03	5.086E-11	6.773E-07
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/mL)</u>	<u>Avg Conc/10xECL</u>	<u>Dil Conc (uCi/mL)</u>	<u>Dil Conc/10xECL</u>
I-132	R	5.949E+01	5.573E-10	5.573E-07	2.098E-13	2.098E-10
I-131	R	1.092E+00	1.023E-11	1.023E-06	3.850E-15	3.850E-10
Nuclide Type Total		6.058E+01	5.675E-10	1.580E-06	2.136E-13	5.948E-10
Total		4.039E+08	3.783E-03	3.804E-01	1.424E-06	1.432E-04

Period: Ann, 2021

Site/Unit/Discharge Point: PSL2

Liquid Dose Summary - Note: All Doses in mRem

<u>Receptor</u>	<u>Agegroup</u>	<u>Bone</u>	<u>Liver</u>	<u>Total Body</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI-Li</u>	<u>Skin</u>
Liquid Receptor - Teenager	Teenager	2.924E-03	4.640E-03	3.917E-03	2.707E-03	4.054E-03	4.162E-03	2.999E-02	0.000E+00
Liquid Receptor - Child	Child	1.777E-03	3.451E-03	3.329E-03	2.503E-03	1.769E-03	3.128E-03	1.274E-02	0.000E+00
Maximum Dose by Organ:		2.924E-03	4.640E-03	3.917E-03	2.707E-03	4.054E-03	4.162E-03	2.999E-02	0.000E+00

Maximum Organ Dose (mRem): 2.999E-02

Maximum Total Body Dose (mRem): 3.917E-03

Period: Ann, 2021

Site/Unit/Discharge Point:

Site

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
Xe-135	N	2.177E+05	6.073E-11	8.675E-05	6.904E-03
Xe-135m	N	5.471E+05	1.526E-10	3.814E-04	1.735E-02
Kr-88	N	2.535E+02	7.071E-14	7.857E-07	8.039E-06
Xe-138	N	4.314E+02	1.203E-13	6.016E-07	1.368E-05
Xe-127	N	6.480E+01	1.807E-14	0.000E+00	2.055E-06
Xe-133	N	1.070E+06	2.983E-10	5.967E-05	3.392E-02
Xe-131m	N	1.065E+07	2.971E-09	1.486E-04	3.378E-01
Kr-89	N	1.825E+04	5.090E-12	5.090E-04	5.787E-04
Xe-133m	N	1.362E+03	3.798E-13	6.330E-08	4.318E-05
Kr-85m	N	3.829E+04	1.068E-11	1.068E-05	1.214E-03
Ar-41	N	4.061E+06	1.133E-09	1.133E-02	1.288E-01
Kr-87	N	1.231E+02	3.435E-14	1.717E-07	3.905E-06
Nuclide Type Total		1.661E+07	4.632E-09	1.253E-02	5.266E-01
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
H-3	O	1.175E+07	3.278E-09	3.278E-03	3.726E-01
G-Alpha	O	3.889E-02	1.085E-17	1.085E-03	1.233E-09
C-14	O	2.050E+07	5.718E-09	1.906E-01	6.501E-01
Nuclide Type Total		3.225E+07	8.996E-09	1.950E-01	1.023E+00
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
Cr-51	P	5.095E-01	1.421E-16	4.737E-10	1.616E-08
Co-60	P	2.949E-01	8.224E-17	1.645E-07	9.350E-09
Nb-95	P	2.893E-01	8.069E-17	4.034E-09	9.173E-09
Zn-65	P	3.930E-01	1.096E-16	2.741E-08	1.246E-08
Nuclide Type Total		1.487E+00	4.147E-16	1.964E-07	4.714E-08
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
I-133	R	3.092E+01	8.625E-15	8.625E-07	9.806E-07
I-131	R	6.415E+00	1.789E-15	8.947E-07	2.034E-07
Nuclide Type Total		3.734E+01	1.041E-14	1.757E-06	1.184E-06
Total		4.886E+07	1.363E-08	2.075E-01	1.549E+00

Period: Ann, 2021

Site/Unit/Discharge Point: Site

Site Boundary NNG Doserate Summary - Note: All Doses in mRem/yr

Receptor	Agegroup	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-Lli	Skin
NW Site Boundary - In	Infant	5.251E-03	4.712E-03	4.712E-03	4.722E-03	7.337E-04	4.712E-03	4.712E-03	0.000E+00
WNW Site Boundary - I	Infant	6.887E-08	6.887E-08	6.887E-08	6.887E-08	6.887E-08	6.887E-08	6.887E-08	0.000E+00
Maximum Doserate by Organ:		5.251E-03	4.712E-03	4.712E-03	4.722E-03	7.337E-04	4.712E-03	4.712E-03	0.000E+00
Maximum Organ Doserate (mRem/yr):		5.251E-03							
Maximum Total Body Doserate (mRem/yr):			4.712E-03						

Site Boundary NG Doserate Summary

Gas Receptor Location	Gamma (mRad/yr)	Beta (mRad/yr)	Total Body (mRem/yr)	Skin (mRem/yr)
NW Site Boundary	2.153E-03	1.394E-03	2.011E-03	3.249E-03
WNW Site Boundary	1.855E-03	1.201E-03	1.733E-03	2.799E-03
Maximum NG Dose Rate:	2.153E-03	1.394E-03	2.011E-03	3.249E-03

Period: Ann, 2021

Site/Unit/Discharge Point:

Site

Maximum Individual NNG Dose Summary - Note: All Doses in mRem

Receptor	Agegroup	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-Li	Skin
NW - Near Milk - Adult	Adult	3.382E-08	4.824E-08	2.737E-08	1.418E-05	8.073E-08	2.795E-09	1.734E-08	0.000E+00
NW Near Milk - Child	Child	1.290E-07	1.343E-07	9.711E-08	4.161E-05	8.262E-08	2.778E-09	1.781E-08	0.000E+00
NW Near Milk - Infant	Infant	2.621E-07	3.172E-07	1.791E-07	9.883E-05	7.649E-08	2.768E-09	1.835E-08	0.000E+00
NW Near Milk - Teenager	Teenager	5.604E-08	7.946E-08	4.599E-08	2.126E-05	1.018E-07	2.795E-09	2.117E-08	0.000E+00
SE Nearest Res - Adult	Adult	2.412E-08	2.899E-08	2.119E-08	3.106E-06	3.842E-08	1.630E-08	2.199E-08	0.000E+00
SE Nearest Res - Child	Child	3.123E-08	3.346E-08	2.491E-08	4.733E-06	2.644E-08	1.623E-08	1.971E-08	0.000E+00
SE Nearest Res - Infant	Infant	2.818E-08	3.235E-08	2.250E-08	4.366E-06	2.005E-08	1.619E-08	1.762E-08	0.000E+00
SE Nearest Res - Teenager	Teenager	2.724E-08	3.363E-08	2.314E-08	3.861E-06	3.842E-08	1.630E-08	2.269E-08	0.000E+00
SE Visitor - Lifeguard 1.0 mi	Adult	1.098E-08	1.311E-08	9.703E-09	1.356E-06	1.722E-08	7.568E-09	1.005E-08	0.000E+00
W Near Garden - Adult	Adult	1.087E-08	1.288E-08	9.658E-09	1.283E-06	1.677E-08	7.639E-09	9.986E-09	0.000E+00
W Near Garden - Child	Child	1.380E-08	1.472E-08	1.119E-08	1.955E-06	1.183E-08	7.608E-09	9.045E-09	0.000E+00
W Near Garden - Teenager	Teenager	1.215E-08	1.479E-08	1.046E-08	1.595E-06	1.677E-08	7.639E-09	1.028E-08	0.000E+00
Maximum Dose by Organ:		2.621E-07	3.172E-07	1.791E-07	9.883E-05	1.018E-07	1.630E-08	2.269E-08	0.000E+00

Maximum Organ Dose (mRem): 9.883E-05

Maximum Total Body Dose (mRem): 1.791E-07

Maximum Individual NG Dose Summary

Gas Receptor Location	Gamma (mRad)	Beta (mRad)	Total Body (mRem)	Skin (mRem)
NW Near Milk 4.25 mi	1.884E-04	1.220E-04	1.760E-04	2.843E-04
SE Nearest Res 1.52 mi 142 deg	9.582E-04	6.204E-04	8.953E-04	1.446E-03
SE Visitor @ 1 mi	4.149E-04	2.686E-04	3.876E-04	6.261E-04
W Near Gard 2.0 miles	3.297E-04	2.134E-04	3.080E-04	4.975E-04
Maximum NG Dose:	9.582E-04	6.204E-04	8.953E-04	1.446E-03

Period: Ann, 2021

Site/Unit/Discharge Point: PSL1

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
Xe-133	N	1.881E+05	1.127E-10	2.255E-05	5.963E-03
Kr-87	N	1.231E+02	7.383E-14	3.691E-07	3.905E-06
Xe-135	N	1.741E+05	1.044E-10	1.491E-04	5.522E-03
Ar-41	N	1.009E+06	6.052E-10	6.052E-03	3.201E-02
Xe-135m	N	2.577E+02	1.545E-13	3.862E-07	8.170E-06
Xe-133m	N	1.154E+03	6.921E-13	1.153E-07	3.661E-05
Xe-127	N	4.255E+01	2.551E-14	0.000E+00	1.349E-06
Kr-88	N	2.535E+02	1.520E-13	1.689E-06	8.039E-06
Xe-138	N	3.949E+02	2.367E-13	1.184E-06	1.252E-05
Kr-89	N	1.825E+04	1.094E-11	1.094E-03	5.787E-04

Nuclide Type Total		1.392E+06	8.346E-10	7.322E-03	4.414E-02
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<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
C-14	O	1.019E+07	6.106E-09	2.035E-01	3.230E-01
H-3	O	8.792E+06	5.271E-09	5.271E-03	2.788E-01
G-Alpha	O	3.671E-02	2.201E-17	2.201E-03	1.164E-09

Nuclide Type Total		1.898E+07	1.138E-08	2.110E-01	6.018E-01
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<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
Nb-95	P	1.158E-01	6.942E-17	3.471E-09	3.672E-09

Nuclide Type Total		1.158E-01	6.942E-17	3.471E-09	3.672E-09
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<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
I-133	R	3.078E+01	1.845E-14	1.845E-06	9.760E-07
I-131	R	3.550E+00	2.128E-15	1.064E-06	1.126E-07

Nuclide Type Total		3.433E+01	2.058E-14	2.909E-06	1.089E-06
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Total		2.037E+07	1.221E-08	2.183E-01	6.459E-01
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Period: Ann, 2021

Site/Unit/Discharge Point: PSL1

Site Boundary NNG Doserate Summary - Note: All Doses in mRem/yr

Receptor	Agegroup	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-Lli	Skin
NW Site Boundary - In	Infant	2.609E-03	2.407E-03	2.407E-03	2.415E-03	3.935E-04	2.407E-03	2.407E-03	0.000E+00
WNW Site Boundary - I	Infant	5.104E-08	5.104E-08	5.104E-08	5.104E-08	5.104E-08	5.104E-08	5.104E-08	0.000E+00
Maximum Doserate by Organ:		2.609E-03	2.407E-03	2.407E-03	2.415E-03	3.935E-04	2.407E-03	2.407E-03	0.000E+00

Maximum Organ Doserate (mRem/yr): 2.609E-03

Maximum Total Body Doserate (mRem/yr): 2.407E-03

Site Boundary NG Doserate Summary

Gas Receptor Location	Gamma (mRad/yr)	Beta (mRad/yr)	Total Body (mRem/yr)	Skin (mRem/yr)
NW Site Boundary	5.131E-04	2.099E-04	4.874E-04	7.312E-04
WNW Site Boundary	4.420E-04	1.808E-04	4.198E-04	6.299E-04
Maximum NG Dose Rate:	5.131E-04	2.099E-04	4.874E-04	7.312E-04

Period: Ann, 2021

Site/Unit/Discharge Point: PSL1

Maximum Individual NNG Dose Summary - Note: All Doses in mRem

Receptor	Agegroup	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-Lli	Skin
NW - Near Milk - Adult	Adult	2.112E-08	3.032E-08	1.682E-08	8.554E-06	5.058E-08	2.048E-09	1.206E-08	0.000E+00
NW Near Milk - Child	Child	7.883E-08	8.286E-08	5.823E-08	2.516E-05	5.100E-08	2.048E-09	1.270E-08	0.000E+00
NW Near Milk - Infant	Infant	1.587E-07	1.940E-07	1.066E-07	5.941E-05	4.706E-08	2.048E-09	1.298E-08	0.000E+00
NW Near Milk - Teenager	Teenager	3.471E-08	4.960E-08	2.792E-08	1.284E-05	6.335E-08	2.048E-09	1.490E-08	0.000E+00
SE Nearest Res - Adult	Adult	1.868E-08	2.302E-08	1.599E-08	2.507E-06	3.117E-08	1.198E-08	1.746E-08	0.000E+00
SE Nearest Res - Child	Child	2.477E-08	2.697E-08	1.898E-08	3.960E-06	2.084E-08	1.198E-08	1.538E-08	0.000E+00
SE Nearest Res - Infant	Infant	2.218E-08	2.603E-08	1.707E-08	3.658E-06	1.534E-08	1.198E-08	1.338E-08	0.000E+00
SE Nearest Res - Teenager	Teenager	2.137E-08	2.709E-08	1.755E-08	3.163E-06	3.117E-08	1.198E-08	1.818E-08	0.000E+00
SE Visitor - Lifeguard 1.0 mi	Adult	8.488E-09	1.038E-08	7.313E-09	1.095E-06	1.394E-08	5.565E-09	7.956E-09	0.000E+00
W Near Garden - Adult	Adult	8.385E-09	1.018E-08	7.273E-09	1.036E-06	1.354E-08	5.620E-09	7.882E-09	0.000E+00
W Near Garden - Child	Child	1.090E-08	1.181E-08	8.510E-09	1.636E-06	9.278E-09	5.620E-09	7.022E-09	0.000E+00
W Near Garden - Teenager	Teenager	9.496E-09	1.186E-08	7.917E-09	1.307E-06	1.354E-08	5.620E-09	8.179E-09	0.000E+00
Maximum Dose by Organ:		1.587E-07	1.940E-07	1.066E-07	5.941E-05	6.335E-08	1.198E-08	1.818E-08	0.000E+00

Maximum Organ Dose (mRem): 5.941E-05

Maximum Total Body Dose (mRem): 1.066E-07

Maximum Individual NG Dose Summary

Gas Receptor Location	Gamma (mRad)	Beta (mRad)	Total Body (mRem)	Skin (mRem)
NW Near Milk 4.25 mi	4.490E-05	1.836E-05	4.265E-05	6.398E-05
SE Nearest Res 1.52 mi 142 deg	2.284E-04	9.340E-05	2.169E-04	3.254E-04
SE Visitor @ 1 mi	9.889E-05	4.044E-05	9.393E-05	1.409E-04
W Near Gard 2.0 miles	7.858E-05	3.213E-05	7.463E-05	1.120E-04
Maximum NG Dose:	2.284E-04	9.340E-05	2.169E-04	3.254E-04

Period: Ann, 2021

Site/Unit/Discharge Point:

PSL2

<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
Xe-131m	N	1.065E+07	5.556E-09	2.778E-04	3.378E-01
Kr-85m	N	3.829E+04	1.997E-11	1.997E-05	1.214E-03
Xe-138	N	3.657E+01	1.907E-14	9.535E-08	1.159E-06
Xe-133m	N	2.074E+02	1.082E-13	1.803E-08	6.576E-06
Xe-135m	N	5.468E+05	2.852E-10	7.129E-04	1.734E-02
Xe-127	N	2.225E+01	1.161E-14	0.000E+00	7.057E-07
Xe-135	N	4.359E+04	2.274E-11	3.248E-05	1.382E-03
Xe-133	N	8.816E+05	4.598E-10	9.196E-05	2.796E-02
Ar-41	N	3.052E+06	1.592E-09	1.592E-02	9.677E-02
Nuclide Type Total		1.521E+07	7.935E-09	1.705E-02	4.825E-01
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
C-14	O	1.032E+07	5.381E-09	1.794E-01	3.271E-01
H-3	O	2.960E+06	1.544E-09	1.544E-03	9.386E-02
G-Alpha	O	2.184E-03	1.139E-18	1.139E-04	6.924E-11
Nuclide Type Total		1.328E+07	6.924E-09	1.810E-01	4.210E-01
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
Cr-51	P	5.095E-01	2.657E-16	8.857E-10	1.616E-08
Co-60	P	2.949E-01	1.538E-16	3.076E-07	9.350E-09
Nb-95	P	1.735E-01	9.049E-17	4.524E-09	5.502E-09
Zn-65	P	3.930E-01	2.050E-16	5.125E-08	1.246E-08
Nuclide Type Total		1.371E+00	7.150E-16	3.642E-07	4.347E-08
<u>Nuclide</u>	<u>Type</u>	<u>Activity (uCi)</u>	<u>Avg Conc (uCi/cc)</u>	<u>Avg Conc/10xECL</u>	<u>Avg Rel Rate (uCi/sec)</u>
I-133	R	1.440E-01	7.513E-17	7.513E-09	4.568E-09
I-131	R	2.866E+00	1.495E-15	7.473E-07	9.087E-08
Nuclide Type Total		3.010E+00	1.570E-15	7.548E-07	9.544E-08
Total		2.849E+07	1.486E-08	1.981E-01	9.035E-01

Period: Ann, 2021

Site/Unit/Discharge Point: PSL2

Site Boundary NNG Doserate Summary - Note: All Doses in mRem/yr

Receptor	Agegroup	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-Lli	Skin
NW Site Boundary - In	Infant	2.642E-03	2.305E-03	2.305E-03	2.306E-03	3.402E-04	2.305E-03	2.305E-03	0.000E+00
WNW Site Boundary - I	Infant	1.783E-08	1.783E-08	1.783E-08	1.783E-08	1.783E-08	1.783E-08	1.783E-08	0.000E+00
Maximum Doserate by Organ:		2.642E-03	2.305E-03	2.305E-03	2.306E-03	3.402E-04	2.305E-03	2.305E-03	0.000E+00

Maximum Organ Doserate (mRem/yr): 2.642E-03

Maximum Total Body Doserate (mRem/yr): 2.305E-03

Site Boundary NG Doserate Summary

Gas Receptor Location	Gamma (mRad/yr)	Beta (mRad/yr)	Total Body (mRem/yr)	Skin (mRem/yr)
NW Site Boundary	1.640E-03	1.184E-03	1.524E-03	2.518E-03
WNW Site Boundary	1.413E-03	1.020E-03	1.313E-03	2.169E-03
Maximum NG Dose Rate:	1.640E-03	1.184E-03	1.524E-03	2.518E-03

Period: Ann, 2021

Site/Unit/Discharge Point: PSL2

Maximum Individual NNG Dose Summary - Note: All Doses in mRem

Receptor	Agroup	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-LI	Skin
NW - Near Milk - Adult	Adult	1.270E-08	1.792E-08	1.055E-08	5.630E-06	3.015E-08	7.477E-10	5.274E-09	0.000E+00
NW Near Milk - Child	Child	5.022E-08	5.141E-08	3.888E-08	1.645E-05	3.162E-08	7.302E-10	5.112E-09	0.000E+00
NW Near Milk - Infant	Infant	1.034E-07	1.232E-07	7.249E-08	3.942E-05	2.943E-08	7.208E-10	5.368E-09	0.000E+00
NW Near Milk - Teenager	Teenager	2.133E-08	2.986E-08	1.807E-08	8.418E-06	3.848E-08	7.478E-10	6.273E-09	0.000E+00
SE Nearest Res - Adult	Adult	5.441E-09	5.970E-09	5.207E-09	5.984E-07	7.249E-09	4.321E-09	4.528E-09	0.000E+00
SE Nearest Res - Child	Child	6.455E-09	6.495E-09	5.931E-09	7.731E-07	5.601E-09	4.247E-09	4.330E-09	0.000E+00
SE Nearest Res - Infant	Infant	5.995E-09	6.315E-09	5.436E-09	7.082E-07	4.717E-09	4.207E-09	4.242E-09	0.000E+00
SE Nearest Res - Teenager	Teenager	5.866E-09	6.540E-09	5.592E-09	6.982E-07	7.249E-09	4.321E-09	4.512E-09	0.000E+00
SE Visitor - Lifeguard 1.0 mi	Adult	2.492E-09	2.723E-09	2.390E-09	2.613E-07	3.281E-09	2.003E-09	2.093E-09	0.000E+00
W Near Garden - Adult	Adult	2.481E-09	2.700E-09	2.385E-09	2.473E-07	3.228E-09	2.019E-09	2.104E-09	0.000E+00
W Near Garden - Child	Child	2.900E-09	2.916E-09	2.684E-09	3.195E-07	2.547E-09	1.988E-09	2.023E-09	0.000E+00
W Near Garden - Teenager	Teenager	2.657E-09	2.935E-09	2.544E-09	2.885E-07	3.228E-09	2.019E-09	2.098E-09	0.000E+00
Maximum Dose by Organ:		1.034E-07	1.232E-07	7.249E-08	3.942E-05	3.848E-08	4.321E-09	6.273E-09	0.000E+00

Maximum Organ Dose (mRem): 3.942E-05

Maximum Total Body Dose (mRem): 7.249E-08

Maximum Individual NG Dose Summary

Gas Receptor Location	Gamma (mRad)	Beta (mRad)	Total Body (mRem)	Skin (mRem)
NW Near Milk 4.25 mi	1.435E-04	1.036E-04	1.334E-04	2.203E-04
SE Nearest Res 1.52 mi 142 deg	7.298E-04	5.270E-04	6.783E-04	1.121E-03
SE Visitor @ 1 mi	3.160E-04	2.282E-04	2.937E-04	4.852E-04
W Near Gard 2.0 miles	2.511E-04	1.813E-04	2.334E-04	3.855E-04
Maximum NG Dose:	7.298E-04	5.270E-04	6.783E-04	1.121E-03

TABLE 3.4
VISITOR DOSE
(1 PAGE)

3.4 Visitor Dose

Dose to a Member of the Public from Activities Inside the Site Boundary
Assessment of radiation dose from radioactive effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY assumes the VISITOR to be a Lifeguard at the Walton Rocks Beach recreation area. The visitor is assumed to be onsite for 6 hours per day for 312 days per year at a distance of 1 mile in the South East sector. The VISITOR received exposure from each of the two reactors on Site. Actual Met Data was used to calculate Visitor Dose for Calendar Year 2021, and the results are below.

Noble Gas Dose	mrads
Gamma Air Dose	9.79E-04
Beta Air Dose	6.34E-04

Gas, Particulate, Iodine, Carbon Dose	mrem
Bone	5.37E-09
Liver	6.41E-09
Thyroid	6.64E-07
Kidney	8.42E-09
Lung	3.70E-09
GI-LLI	4.92E-09
Total Body	4.75E-09