BYRON NUCLEAR POWER STATION

ANNUAL RADIOLOGICAL EFFLUENT RELEASE REPORT (ARERR)

2009

BYRON NUCLEAR POWER STATION
UNIT 1/2 DOCKET NUMBER STN-50-454/455
RADIOACTIVE EFFLUENT RELEASE REPORT
January 2009 - December 2009
Supplemental Information

1. Regulatory Limits

a. Fission and activation gases:

Tech Spec Whole Body	=	500 mrem/year
Skin	=	3000 mrem/year
10CFR50 Gamma	=	5 mrad/quarter; 10 mrad/year
Beta	=	10 mrad/quarter; 20 mrad/year

b. Iodine: (summed with particulate, see below)

c. Particulates with half-lives > 8 days:

Tech Spec Organ	=	1500 mrem/year
10CFR50 Organ	=	7.5 mrem/quarter; 15 mrem/year

d. Liquid Effluents:

10CFR50 Whole Body	=	1.5 mrem/quarter; 3 mrem year
Organ	=	5 mrem/quarter; 10 mrem/year

e. Total Effective Dose Equivalent:

10CFR20 TEDE	=	100 mrem/year

2. Maximum Permissible Concentration

a. Fission and Activation Gases: 10CFR20 Appendix B Table 2
b. Iodine: 10CFR20 Appendix B Table 2
c. Particulates: 10CFR20 Appendix B Table 2
d. Liquid Effluents: 10 X 10CFR20 Appendix B Table 2

3. Average Energy: This item is not applicable. Release rates are calculated using an isotopic mix rather than average energy.

4. Measurements and Approximations of Total Radioactivity

a. Fission and activation gases: Prior to release, the isotopic content is determined. Released activity is calculated using volume of release, which is determined by the change in tank or containment pressure. Additional methods of calculation utilize historical data and assign an isotopic mix, which is representative of normal vent stack isotopics.

b. Particulate, tritium and iodine sampling media for the plant vent stacks are collected and isotopically analyzed weekly.

c. Liquid effluents: Isotopic analysis is performed on each batch release prior to its release. Total release activity is calculated using volume of release. Total tritium activity released is calculated

from the highest of a monthly circulating water blowdown composite activity or a sum of the input composite activities.

d. Analysis results that are less than the lower limit of detection (<LLD) are reported in units of uCi/cc or uCi/ml unless otherwise noted. All LLD values are listed in Attachment A.

5. Batch Releases:

a. Liquid:

1. Number of batch releases = 76
2. Total time period for batch releases = 10,837 minutes
3. Maximum time period for a batch release = 441 minutes
4. Average time period for a batch release = 143 minutes
5. Minimum time period for a batch release = 45 minutes
6. Average stream flow during periods of release of effluent into a flowing stream = 309 m^3/sec, based on information from the U.S. Geological Survey Byron Gauging Station.

b. Gaseous:

1. Number of batch releases = 314
2. Total time period for batch releases = 31,765 minutes
3. Maximum time period for a batch release = 3,333 minutes
4. Average time period for batch releases = 101 minutes
5. Minimum time period for a batch release = 10 minutes

6. Abnormal Releases:

a. Liquid - None

b. Gaseous – None

7. 2009 Radiological Groundwater Protection Program (RGPP) Results Summary:

In 2009, the number of Radiological Groundwater Protection Program (RGPP) monitoring wells sampled was reduced from 22 to 13 based on the evaluation and recommendation from an environmental consulting firm. The 9 wells removed from the sampling program in 2009 had not tested positive for tritium since the program began in 2006 and were determined to be low risk for contamination based on their locations commensurate with local hydrogeology. The samples obtained from the 13 wells in 2009 were obtained in April and October and analyzed for tritium. Of these samples, two wells contained levels of tritium above the lower limit of detection (LLD) of 200 pCi/L. They were: AR-4 (1350 pCi/L in April, 1360 pCi/L in October) and AR-11 (1110 pCi/L in April, 1010 pCi/L in October). Both of these wells are near the Circulating Water Blowdown piping, where historical leakage through vacuum breakers was known to have occurred. Well AR-4 has shown an overall steady decrease in tritium concentration since first sampled in 2006. Well AR-11 has also shown an overall decrease in tritium since 2006, and a slight decrease from 2008. The dose consequence from tritium present in these sample wells is negligible.

8. 2007 Errata

During the week of 8/3/2009, the biennial Nuclear Regulatory Commission (NRC) inspection per NRC inspection manual 71122.02, Radioactive Material Processing and Transportation, identified that resin radioactive waste shipment RWS 07-015 on 12/5/07 used incorrect samples and scaling factors to characterize the resin. During the extent of condition review, one other resin shipment, RWS 07-016 on 12/12/07, was found to contain the same error as found in shipment RWS 07-015. After re-characterizing the shipments using the proper scaling factors, the waste shipment classification (Class

"C") did not change, however, the new radionuclide makeup resulted in minor changes to the total curie content of the shipments. Using the correct scaling factors, shipment RWS 07-015 on 12/5/07 went from 211 to 288 curies. Shipment RWS-07-016 on 12/12/07 went from 338 to 203 curies. Below are the corrected shipment and quarterly curie totals:

SOLID RADIOACTIVE WASTE FOR BURIAL 4TH QUARTER 2007

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME PER SHIPMENT	CURIES* PER SHIPMENT
10/08/07	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), 7, UN2912, CLASS A, GENERAL DESIGN PACKAGE, 20' METAL BOX, NONE	EXCLUSIVE-USE	Oak Ridge, TN	9.23E+00	4.62E-03
11/28/07	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, CLASS B, TYPE B(U) PACKAGE, CASK, NONE	EXCLUSIVE-USE	Barnwell, SC	2.63E+00	4.19E+01
12/5/07	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, 7, UN2916, CLASS C, TYPE B(U) PACKAGE, CASK, NONE	EXCLUSIVE-USE	Barnwell, SC	2.63E+00	2.88E+02
12/12/07	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, 7, UN2916, CLASS C, TYPE B(U) PACKAGE, CASK, NONE	EXCLUSIVE-USE	Barnwell, SC	2.63E+00	2.03E+02
Quarterly Totals		Number of Shipments:	4	1.71E+01	5.33E+02
* Calculated using measured ratios				CUBIC M	CURIES

SUMMARY

Calculations based on gaseous and liquid effluents, Rock River flow and average/concurrent meteorological data indicate that public dose due to radioactive material attributable to Byron Station during the reporting period did not exceed any limits listed in the Regulatory Limits section.

The Total Effective Dose Equivalent (TEDE) due to licensed activities at Byron Station calculated for the maximum-exposed individual for the period is 3.09E-01 mrem. The annual limit on TEDE is 100 mrem.

The assessment of radiation doses to the public is performed in accordance with the ODCM. The results of these analyses confirm that the station is operating in compliance with 10CFR50 Appendix I, 10CFR20 and 40CFR190.

There were no additional operational controls implemented which affected the areas of radiological effluents in 2009.

There were no measurements which exceeded the reporting levels, including any which would not have been attributable to station effluents.

The results of the current radiological environmental monitoring program are approximately the same as those found during the pre-operational studies conducted at Byron Station.

Gaseous Effluents to the Atmosphere

A total of 1.20E+01 curies of fission and activation gases were released with a maximum average quarterly release rate of 1.33E+00 µCi/sec.

A total of 1.01E-04 curies of 1-131 were released during the year with a maximum average quarterly release rate of 6.41E-06 µCi/sec.

A total of 1.51E-05 curies were released as airborne particulate matter with a maximum average quarterly release rate of 1.12E-06 µCi/sec. Alpha-emitting radionuclides were below detectable limits.

A total of 0.00E+00 curies of other radioisotopes were released with a maximum average quarterly release rate of 0.00E+00 µCi/sec.

A total of 1.05E+02 curies of tritium were released with a maximum average quarterly release rate of 2.60E+00 µCi/sec.

Liquids Released to Rock River

A total of 2.76E+10 liters of radioactive liquid wastes (prior to dilution) containing 2.10E-02 curies (excluding tritium, noble gases and alpha) were discharged from the station. These wastes were released at a maximum quarterly average concentration of 1.01E-09 µCi/ml. A total of 1.81E+03 curies of tritium were released.

Gamma Dose Rates

Offsite Gamma air and whole body dose rates were calculated based on measured release rates, isotopic composition of the noble gases, and average meteorological data for the period. Based on measured effluents and average meteorological data, the maximum total body dose to an individual would be 1.73E-02 mrem for the year, with an occupancy or shielding factor of 0.7 included. The maximum total body dose based on measured effluents and concurrent meteorological data would be 9.72E-06 mrem. The maximum gamma air dose was 1.64E-04 mrad based on measured effluents and average meteorological data, and 1.93E-05 mrad based on concurrent meteorological data.

Beta Air and Skin Dose Rates

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "semi-infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate due to the effect of the beta particle energies, thickness of inert skin and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 7.0 mg/cm^2 and an occupancy factor of 1.0 is used. The skin dose based on concurrent meteorological data for the year was 2.52E-04 mrem. The maximum offsite beta air dose for the year, based on measured effluents and average meteorological data, was 6.36E-04 mrad. The beta air dose based on concurrent meteorological data was 4.52E-04 mrad.

Radioactive Iodine

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine. The minimal levels of radioiodine, 1-131, released during routine operation of the station, may be made available to man resulting in a dose to the thyroid. The principal pathway of interest for this radionuclide is ingestion of radioiodine in milk. Calculations made for 2009 and previous years indicate that contributions to doses from inhalation of I-131 and I-133 and ingestion of I-133 in milk are negligible. The hypothetical thyroid dose to the maximum exposed individual living near the station via ingestion of milk was calculated. The radionuclide considered was I-131 and the source of milk was taken to be the nearest dairy farm with the cows pastured from May through October. The maximum thyroid dose was 7.10E-02 mrem during the year (infant).

Liquid Effluent Pathways

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while on the shoreline. Not all of these pathways are significant or applicable at a given time or station but a reasonable approximation of the dose can be made by adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC developed equations were used to calculate the doses to the whole body, lower GI tracts, thyroid, bone and skin; specific parameters for use in the equations are given in the Exelon Offsite Dose Calculation Manual. The maximum whole body dose for the year was 2.92E-01 mrem (adult) and no organ dose exceeded 3.60E-01 mrem (adult).

Site Meteorology

A summary of the site meteorological measurements taken during each calendar quarter of the year is included in the Annual Radiological Environmental Operating Report (AREOR) or is retained on file to be provided upon request. The data are presented as cumulative joint frequency distributions of the wind direction for the 250' level and wind speed class by atmospheric stability class determined from the temperature difference between the 250' and 30' levels. Data recovery for all measurements on the tower was 99.8% during 2009.

SOLID RADIOACTIVE WASTE FOR BURIAL 1ST QUARTER 2009

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME (m^3) PER SHIPMENT	CURIES* PER SHIPMENT
2/12/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (2), NONE	EXCLUSIVE-USE	Oak Ridge, TN	6.52E+01	9.77E-02
3/9/09	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE LIMITED QUANTITY OF MATERIAL, 7, UN2910, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (3), NONE	EXCLUSIVE-USE	Oak Ridge, TN	2.13E+01	8.23E-03
3/24/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX, NONE	EXCLUSIVE-USE	Oak Ridge, TN	3.21E+01	1.16E-01
3/31/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (2), NONE	EXCLUSIVE-USE	Oak Ridge, TN	6.80E+01	8.99E-02
Quarterly Totals		Number of Shipments:	4	1.87E+02	3.12E-01
* Calculated using measured ratios				CUBIC M	CURIES

SOLID RADIOACTIVE WASTE FOR BURIAL 2ND QUARTER 2009

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME (m^3) PER SHIPMENT	CURIES* PER SHIPMENT
4/1/09	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE LIMITED QUANTITY OF MATERIAL, 7, UN2910, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), POLYETHELYNE LINER, NONE	EXCLUSIVE-USE	Clive, UT	4.76E+01	6.83E-03
4/8/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), CASK, NONE	EXCLUSIVE-USE	Clive, UT	4.53E+00	2.04E+01
4/14/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), CASK, NONE	EXCLUSIVE-USE	Clive, UT	4.67E+00	1.03E+01
5/11/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (3), NONE	EXCLUSIVE-USE	Oak Ridge, TN	2.07E+01	7.77E-03
5/13/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (2), NONE	EXCLUSIVE-USE	Oak Ridge, TN	6.63E+01	3.96E-02
Quarterly Totals		Number of Shipments:	5	1.44E+02	3.08E+01
* Calculated using measured ratios				CUBIC M	CURIES

SOLID RADIOACTIVE WASTE FOR BURIAL 3RD QUARTER 2009

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME (m^3) PER SHIPMENT	CURIES* PER SHIPMENT
7/22/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (2), NONE	EXCLUSIVE-USE	Oak Ridge, TN	6.80E+01	7.35E-02
8/28/09	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE LIMITED QUANTITY OF MATERIAL, 7, UN2910, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX, NONE	EXCLUSIVE-USE	Oak Ridge, TN	1.04E+01	4.87E-03
Quarterly Totals		Number of Shipments:	2	7.84E+01	7.84E-02
* Calculated using measured ratios				CUBIC M	CURIES

SOLID RADIOACTIVE WASTE FOR BURIAL 4TH QUARTER 2009

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME(m^3) PER SHIPMENT	CURIES* PER SHIPMENT
10/14/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), HIGH INTEGRITY CONTAINER, NONE	EXCLUSIVE-USE	Clive, UT	4.53E+00	3.07E+00
10/21/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, CLASS A, GENERAL DESIGN PACKAGE (GDP), HIGH INTEGRITY CONTAINER, NONE	EXCLUSIVE-USE	Clive, UT	4.81E+00	8.17E+00
11/6/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (2), NONE	EXCLUSIVE-USE	Oak Ridge, TN	6.73E+01	7.52E-02
12/2/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX, NONE	EXCLUSIVE-USE	Oak Ridge, TN	2.53E+01	2.04E-01
12/3/09	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, UN3321, FISSILE EXCEPTED, CLASS A, GENERAL DESIGN PACKAGE (GDP), 20' METAL BOX (2), NONE	EXCLUSIVE-USE	Oak Ridge, TN	6.80E+01	2.51E-01
Quarterly Totals		Number of Shipments:	5	1.70E+02	1.18E+01
* Calculated using measured ratios				CUBIC M	CURIES

SOLID RADIOACTIVE WASTE FOR BURIAL
Estimated Solid Waste Composition
2009

Resins, Filters, Evap Bottoms			
2009			
Volume (m3) 1.85E+01			
Class A			
Nuclide	% Adund	Curies	uCi/ml
H-3	56.089	2.35E+01	1.27E+00
C-14	0.351	1.47E-01	7.95E-03
CR-51	0.002	9.82E-04	5.31E-05
MN-54	1.174	4.93E-01	2.66E-02
FE-55	7.168	3.01E+00	1.63E-01
FE-59	0.002	9.33E-04	5.04E-05
CO-57	0.450	1.89E-01	1.02E-02
CO-58	14.027	5.89E+00	3.18E-01
CO-60	10.437	4.38E+00	2.37E-01
NI-59	0.153	6.40E-02	3.46E-03
NI-63	7.351	3.08E+00	1.66E-01
ZN-65	0.113	4.75E-02	2.57E-03
SR-89	0.000	1.20E-04	6.49E-06
SR-90	0.009	3.82E-03	2.06E-04
ZR-95	0.009	3.90E-03	2.11E-04
NB-95	0.002	8.75E-04	4.73E-05
TC-99	0.012	4.94E-03	2.67E-04
RU-103	0.000	1.07E-06	5.78E-08
AG-110M	0.012	4.99E-03	2.70E-04
SN-113	0.004	1.84E-03	9.95E-05
SB-124	0.001	3.06E-04	1.65E-05
SB-125	1.567	6.57E-01	3.55E-02
TE-123M	0.002	9.40E-04	5.08E-05
TE-125M	0.005	2.19E-03	1.18E-04
I-129	0.000	4.35E-05	2.35E-06
CS-134	0.039	1.63E-02	8.81E-04
CS-137	0.426	1.79E-01	9.68E-03
CE-144	0.562	2.36E-01	1.28E-02
PU-238	0.000	4.11E-05	2.22E-06
PU-239	0.000	1.98E-05	1.07E-06
PU-241	0.033	1.39E-02	7.51E-04
AM-241	0.000	1.02E-05	5.51E-07
CM-242	0.000	6.70E-06	3.62E-07
CM-243	0.000	1.03E-05	5.57E-07

Dry Active Waste			
2009			
Volume (m3) 5.50E+02			
Class A			
Nuclide	% Adund	Curies	uCi/ml
H-3	3.845	3.73E-02	6.78E-05
C-14	0.046	4.45E-04	8.09E-07
CR-51	3.751	3.64E-02	6.62E-05
MN-54	1.469	1.43E-02	2.60E-05
FE-55	23.929	2.32E-01	4.22E-04
FE-59	0.803	7.79E-03	1.42E-05
CO-57	0.142	1.38E-03	2.51E-06
CO-58	23.267	2.26E-01	4.11E-04
CO-60	17.682	1.72E-01	3.13E-04
NI-59	0.051	4.93E-04	8.96E-07
NI-63	13.884	1.35E-01	2.45E-04
ZN-65	0.034	3.31E-04	6.02E-07
SR-90	0.006	6.16E-05	1.12E-07
ZR-95	3.615	3.51E-02	6.38E-05
NB-95	4.918	4.77E-02	8.67E-05
TC-99	0.875	8.48E-03	1.54E-05
SN-113	0.052	5.02E-04	9.13E-07
SB-125	0.520	5.04E-03	9.16E-06
TE-123M	0.029	2.81E-04	5.11E-07
I-129	0.000	2.59E-06	4.71E-09
CS-137	0.159	1.54E-03	2.80E-06
CE-144	0.467	4.53E-03	8.24E-06
PU-238	0.038	3.73E-04	6.78E-07
PU-239	0.018	1.78E-04	3.24E-07
PU-241	0.359	3.48E-03	6.33E-06
AM-241	0.010	9.27E-05	1.69E-07
CM-242	0.020	1.91E-04	3.47E-07
CM-243	0.011	1.08E-04	1.96E-07

Irradiated Components			
2009 - No Shipments			
Volume (m3) 0.00E+00			
Class N/A			
	% Abund	Curies	uCi/ml

Other Waste (Oil)			
2009			
Volume (m3) 1.04E+01			
Class A			
	% Abund	Curies	uCi/ml
H-3	99.970	4.87E-03	4.68E-04
C-14	0.000	1.10E-09	1.06E-10
FE-55	0.004	1.97E-07	1.89E-08
CO-60	0.003	1.68E-07	1.62E-08
NI-59	0.000	2.28E-09	2.19E-10
NI-63	0.003	1.63E-07	1.57E-08
SR-90	0.000	2.42E-09	2.33E-10
TC-99	0.000	8.05E-09	7.74E-10
I-129	0.000	2.92E-12	2.81E-13
CS-137	0.002	1.14E-07	1.10E-08
CE-144	0.017	8.14E-07	7.83E-08
PU-238	0.000	4.24E-10	4.08E-11
PU-239	0.000	2.01E-10	1.93E-11
PU-241	0.000	3.72E-09	3.58E-10
AM-241	0.000	1.08E-10	1.04E-11
CM-242	0.000	4.99E-11	4.80E-12
CM-243	0.000	1.69E-10	1.63E-11

During the calendar year 2009, no changes were implemented to RW-AA-100, Process Control Program for Radioactive Wastes.

Error Analysis

The following is an estimate of the errors associated with effluent monitoring and analysis. The estimate is calculated using the square root of the sum of the squares methodology.

1. Gaseous Effluents

   Qme=3.33%
   RM=N/A
   ECe=5%
   Stdcse/Smplcse=5%
   qme=N/A

   Total error = 7.8%

2. Liquid Effluents

   Qme=3.33%
   RM=N/A
   ECe=N/A
   Stdcse/Smplcse=5%
   qme=2.22%

   Total error = 6.4%

3. Waste Resin

   Qme=10.0%
   RM=N/A
   ECe=5%
   Stdcse/Smplcse=5%
   qme=1.0%

   Total error = 12.3%

4. DAW, Mechanical Filters, and Contaminated Metal

   Qme=10.0%
   RM=N/A
   ECe=N/A
   Stdcse/Smplcse=5%
   qme=N/A

   Instrument calibration error = 10%

   Total error = 11.2%

Definition of Terms

Qme = the process quantity measurement error associated with the release point (e.g. flow, level measurements)

RM = error associated with the radiation monitor used in quantifying releases through the release point

ECe = error associated with the collection efficiency of the sample media

Stdcse = one-sigma counting error associated with the counting instrument of interest

Smplcse = one-sigma counting error associated with a sample of a given geometry that is used for the release point of interest

qme = sample quantity measurement error associated with the sample of interest

Miscellaneous Information

A. As required by Technical Specification 5.6.2, meteorological and environmental impact information is reported in the Station Annual Radiological Environmental Operating Report or is retained on file to be provided upon request.

B. No limits were exceeded in liquid hold up tanks as stated in Technical Specification 5.5.12 or in waste gas decay tanks as stated in Technical Specification 5.5.12.

C. There were no irradiated fuel shipments during this reporting period.

D. There were no REMP sample results that exceeded any technical specification limits or analytical results investigation levels during this reporting period. REMP third quarter composite surface water sample from point BY-12, Rock River downstream of the plant liquid effluent discharge, had a tritium result of 725 pCi/L. Although this result is well below the reportable limit of 30,000 pCi/L, tritium is not typically observed above the detection limit in this sample under normal operating conditions. The positive tritium result was likely due to the increase in liquid releases performed prior to and during the refueling outage beginning in September 2009. REMP November milk control sample result from BY-26-1 was 3.58 pCi/L for I-131, above the LLD of 1.00 pCi/L and the reportable limit of 3.00 pCi/L. This result was determined to be a false positive due to nuclide interference as a result of sample preparation contamination, as the sample was recounted one week later and showed an increase in activity, which is not consistent with radioactive decay of I-131. Milk samples from other plants in the same time period also had similar results. The issue has been properly documented via the vendor laboratory corrective action process.

E. There were no elevated releases during this reporting period. All releases are considered vent or ground level releases.

F. There were no plant effluent radiation release monitors that exceeded inoperability time limits as stated in TRM TLCO 3.11.a, TRM TLCO 3.11.b, or Technical Specification 5.5.12.

G. There were no unplanned or abnormal releases from the site to unrestricted areas during this reporting period.

H. Revision 6 of the ODCM was issued on May of 2009. The revision included literature and references that were added to include the planned commencement of Independent Spent Fuel Storage Installation (ISFSI), updates to REMP sample locations and TLD locations, and editorial changes. Although originally planned for 2009, the ISFSI campaign experienced delays, and no spent fuel was moved in 2009. None of the changes to the ODCM affected the ability to maintain the level of radioactive effluent control required by 10CFR20, 40CFR190, or 10CFR50, nor did the changes impact the accuracy or reliability of effluent dose or set point calculations.

I. Attached are offsite dose calculation reports for January through December of 2009.

Attachment A, 2009 Radioactive Effluent Release Report
2009 Lower Limits of Detection (LLD's)

Nuclide	Gaseous LLD (uCi/cc)	Nuclide	Liquid LLD (uCi/ml)
H3	6.26E-08	H3	2.05E-06
Ar41	4.55E-07	Na24	3.27E-08
Cr51	3.05E-12	Cr51	2.10E-07
Mn54	6.23E-13	Mn54	3.56E-08
Co58	7.55E-13	Fe55	9.30E-07
Fe59	1.58E-12	Co57	2.20E-08
Co60	1.14E-12	Co58	3.12E-08
Zn65	3.38E-13	Fe59	8.86E-08
Br82	6.22E-13	Co60	5.10E-08
Kr85m	1.50E-07	Zn65	8.53E-08
Kr87	4.30E-07	Sr85	3.81E-08
Kr88	4.87E-07	Sr89	3.65E-07
Sr89	3.09E-14	Sr-90	6.23E-09
Sr-90	1.97E-15	Sr92	4.01E-08
Mo99	2.44E-13	Nb95	6.78E-09
I131	5.00E-13	Zr95	6.90E-08
Xe131m	6.58E-06	Mo99	2.14E-08
I133	7.87E-13	Ag110m	3.25E-08
Xe133	4.11E-07	Sb122	4.73E-08
Xe133m	1.71E-06	Te123m	2.29E-08
Cs134	4.80E-13	Sb124	1.03E-07
I135	3.07E-12	Sb125	8.52E-08
Xe135	1.94E-07	Te125m	6.95E-06
Cs137	3.44E-13	Sb126	3.76E-08
Xe138	6.97E-07	I131	2.89E-08
Ba140	2.00E-12	I132	2.08E-08
La140	2.58E-13	Te132	2.48E-08
Ce141	5.36E-13	I133	3.80E-08
Ce144	1.93E-12	Xe133	5.90E-08
Gross Alpha	4.09E-13	Cs134	3.73E-08
		Xe135	2.77E-08
		Cs137	3.05E-08
		Ba140	1.07E-07
		La140	1.42E-08
		Ce141	4.06E-08
		Ce144	1.67E-07
		Gross Alpha	8.31E-08

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
2009 Unit 1

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	3.35E-03	2.64E-03	2.32E-03	2.77E-03	1.05E-02
2. Avg. Diluted Conc.	uCi/ml	1.01E-09	7.41E-10	6.49E-10	8.38E-10	7.61E-10
Tritium						
1. Total Release	Ci	1.63E+02	2.12E+02	4.14E+02	1.18E+02	9.07E+02
2. Avg. Diluted Conc.	uCi/ml	4.92E-05	5.96E-05	1.16E-04	3.56E-05	6.59E-05
Dissolved and Entrained Gases						
1. Total Release	Ci	3.54E-03	4.88E-06	1.64E-03	0.00E+00	5.18E-03
2. Avg. Diluted Conc.	uCi/ml	1.07E-09	1.37E-12	4.58E-10	0.00E+00	3.76E-10
Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Volume of liquid waste	liters	3.32E+09	3.56E+09	3.58E+09	3.30E+09	1.38E+10
Volume of dil. water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A - Release Tank
LIQUID EFFLUENTS - SUMMATION BY RELEASE POINT
2009 Unit 1

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	3.35E-03	2.64E-03	2.32E-03	2.77E-03	1.05E-02
2. Avg. Diluted Conc.	uCi/ml	6.23E-06	4.91E-06	1.68E-06	3.88E-06	3.30E-06
Tritium						
1. Total Release	Ci	1.56E+02	1.98E+02	3.70E+02	1.08E+02	8.33E+02
2. Avg. Diluted Conc.	uCi/ml	2.91E-01	3.69E-01	2.68E-01	1.51E-01	2.62E-01
Dissolved and Entrained Gases						
1. Total Release	Ci	3.54E-03	4.88E-06	1.64E-03	0.00E+00	5.18E-03
2. Avg. Diluted Conc.	uCi/ml	6.58E-06	9.08E-09	1.18E-06	0.00E+00	1.63E-06
Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Volume of liquid waste	liters	5.38E+05	5.37E+05	1.38E+06	7.14E+05	3.17E+06
Volume of dil. water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A - Circulating Water Blowdown
LIQUID EFFLUENTS - SUMMATION BY RELEASE POINT
2009 Unit 1

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Diluted Conc.	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
1. Total Release	Ci	6.96E+00	1.41E+01	4.41E+01	9.61E+00	7.47E+01
2. Avg. Diluted Conc.	uCi/ml	2.09E-06	3.96E-06	1.23E-05	2.91E-06	5.43E-06
Dissolved and Entrained Gases						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Diluted Conc.	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Volume of liquid waste	liters	3.32E+09	3.56E+09	3.58E+09	3.30E+09	1.38E+10
Volume of dil. water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2B
LIQUID EFFLUENTS - CONTINUOUS MODE
2009 Unit 1

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Tritium						
H-3	Ci	6.96E+00	1.41E+01	4.41E+01	9.61E+00	7.47E+01
Totals for Period...	Ci	6.96E+00	1.41E+01	4.41E+01	9.61E+00	7.47E+01
Dissolved and Entrained Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2B
LIQUID EFFLUENTS - BATCH MODE
2009 Unit 1

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
AG-110M	Ci	0.00E+00	0.00E+00	2.29E-05	0.00E+00	2.29E-05
CO-57	Ci	1.09E-05	1.70E-05	8.07E-06	2.66E-06	3.87E-05
CO-58	Ci	2.48E-03	1.39E-03	8.18E-04	2.59E-03	7.28E-03
CO-60	Ci	2.97E-04	4.38E-04	6.48E-04	1.14E-04	1.50E-03
CS-137	Ci	0.00E+00	0.00E+00	0.00E+00	2.52E-06	2.52E-06
I-131	Ci	0.00E+00	0.00E+00	1.34E-06	0.00E+00	1.34E-06
MN-54	Ci	1.08E-05	1.07E-05	2.16E-05	2.41E-06	4.55E-05
NB-95	Ci	0.00E+00	0.00E+00	0.00E+00	1.36E-06	1.36E-06
SB-124	Ci	0.00E+00	0.00E+00	5.44E-06	0.00E+00	5.44E-06
SB-125	Ci	0.00E+00	0.00E+00	1.34E-05	0.00E+00	1.34E-05
SR-85	Ci	1.53E-05	0.00E+00	4.59E-06	0.00E+00	1.99E-05
TE-125M	Ci	5.36E-04	5.62E-04	4.48E-04	0.00E+00	1.55E-03
Totals for Period...	Ci	3.35E-03	2.42E-03	1.99E-03	2.71E-03	1.05E-02
Tritium						
H-3	Ci	1.56E+02	1.98E+02	3.70E+02	1.08E+02	8.33E+02
Totals for Period...	Ci	1.56E+02	1.98E+02	3.70E+02	1.08E+02	8.33E+02
Dissolved and Entrained Gases						
KR-85	Ci	3.50E-03	0.00E+00	1.05E-03	0.00E+00	4.55E-03
XE-133	Ci	3.70E-05	4.88E-06	5.91E-04	0.00E+00	6.32E-04
Totals for Period...	Ci	3.54E-03	4.88E-06	1.64E-03	0.00E+00	5.18E-03
Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
Unit 1 2009

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
1. Total Release	Ci	2.67E-01	2.28E-01	3.63E-01	1.06E+01	1.14E+01
2. Avg. Release Rate	uCi/sec	3.39E-02	2.89E-02	4.61E-02	1.33E+00	3.62E-01
Iodine-131						
1. Total Release	Ci	0.00E+00	0.00E+00	6.99E-06	5.96E-06	1.29E-05
2. Avg. Release Rate	uCi/sec	0.00E+00	0.00E+00	8.86E-07	7.56E-07	4.10E-07
Particulates Half Life >= 8 days						
1. Total Release	Ci	0.00E+00	4.56E-06	8.85E-06	0.00E+00	1.34E-05
2. Avg. Release Rate	uCi/sec	0.00E+00	5.78E-07	1.12E-06	0.00E+00	4.25E-07
Tritium						
1. Total Release	Ci	2.60E+00	3.11E+01	1.16E+01	7.74E+00	5.31E+01
2. Avg. Release Rate	uCi/sec	3.29E-01	3.95E+00	1.47E+00	9.82E-01	1.68E+00
Gross Alpha						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Release Rate	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1C
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE
Unit 1 2009

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
XE-133	Ci	1.21E-01	1.27E-01	6.44E-02	5.81E-02	3.70E-01
Totals for Period...	Ci	1.21E-01	1.27E-01	6.44E-02	5.81E-02	3.70E-01
Iodines						
I-131	Ci	0.00E+00	0.00E+00	6.99E-06	5.96E-06	1.29E-05
I-132	Ci	0.00E+00	0.00E+00	3.40E-04	0.00E+00	3.40E-04
I-133	Ci	0.00E+00	0.00E+00	9.70E-05	0.00E+00	9.70E-05
Totals for Period...	Ci	0.00E+00	0.00E+00	4.44E-04	5.96E-06	4.50E-04
Particulates Half Life >= 8 days						
CR-51	Ci	0.00E+00	4.05E-06	0.00E+00	0.00E+00	4.05E-06
TE-123M	Ci	0.00E+00	5.07E-07	0.00E+00	0.00E+00	5.07E-07
ZN-69M	Ci	0.00E+00	0.00E+00	8.85E-06	0.00E+00	8.85E-06
Totals for Period...	Ci	0.00E+00	4.56E-06	8.85E-06	0.00E+00	1.34E-05
Tritium						
H-3	Ci	2.60E+00	3.11E+01	1.16E+01	7.74E+00	5.31E+01
Totals for Period...	Ci	2.60E+00	3.11E+01	1.16E+01	7.74E+00	5.31E+01
Gross Alpha						
Gross Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1C
GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE
Unit 1 2009

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
AR-41	Ci	0.00E+00	7.61E-03	1.01E-02	1.57E-02	3.34E-02
KR-85	Ci	0.00E+00	0.00E+00	0.00E+00	1.05E+01	1.05E+01
KR-85M	Ci	0.00E+00	0.00E+00	1.74E-04	0.00E+00	1.74E-04
XE-131M	Ci	1.36E-04	5.71E-05	2.46E-04	7.43E-05	5.13E-04
XE-133	Ci	1.46E-01	9.38E-02	2.62E-01	1.78E-02	5.19E-01
XE-133M	Ci	7.93E-06	0.00E+00	2.59E-03	3.03E-04	2.90E-03
XE-135	Ci	3.78E-04	9.34E-07	2.39E-02	1.28E-03	2.56E-02
Totals for Period...	Ci	1.47E-01	1.02E-01	2.99E-01	1.05E+01	1.10E+01
Iodines						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Particulates Half Life >= 8 days						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Tritium						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Gross Alpha						
** No Nuclide Activities **		.....	.....	.....	.....	.....

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
2009 Unit 2

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	3.35E-03	2.64E-03	2.32E-03	2.77E-03	1.05E-02
2. Avg. Diluted Conc.	uCi/ml	1.01E-09	7.41E-10	6.49E-10	8.38E-10	7.61E-10
Tritium						
1. Total Release	Ci	1.63E+02	2.12E+02	4.14E+02	1.18E+02	9.07E+02
2. Avg. Diluted Conc.	uCi/ml	4.92E-05	5.96E-05	1.16E-04	3.56E-05	6.59E-05
Dissolved and Entrained Gases						
1. Total Release	Ci	3.54E-03	4.88E-06	1.64E-03	0.00E+00	5.18E-03
2. Avg. Diluted Conc.	uCi/ml	1.07E-09	1.37E-12	4.58E-10	0.00E+00	3.76E-10
Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Volume of liquid waste	liters	3.32E+09	3.56E+09	3.58E+09	3.30E+09	1.38E+10
Volume of dil. water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A - Release Tank
LIQUID EFFLUENTS - SUMMATION BY RELEASE POINT
2009 Unit 2

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	3.35E-03	2.64E-03	2.32E-03	2.77E-03	1.05E-02
2. Avg. Diluted Conc.	uCi/ml	6.23E-06	4.91E-06	1.68E-06	3.88E-06	3.30E-06
Tritium						
1. Total Release	Ci	1.56E+02	1.98E+02	3.70E+02	1.08E+02	8.33E+02
2. Avg. Diluted Conc.	uCi/ml	2.91E-01	3.69E-01	2.68E-01	1.51E-01	2.62E-01
Dissolved and Entrained Gases						
1. Total Release	Ci	3.54E-03	4.88E-06	1.64E-03	0.00E+00	5.18E-03
2. Avg. Diluted Conc.	uCi/ml	6.58E-06	9.08E-09	1.18E-06	0.00E+00	1.63E-06
Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Volume of liquid waste	liters	5.38E+05	5.37E+05	1.38E+06	7.14E+05	3.17E+06
Volume of dil. water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2A - Circulating Water Blowdown
LIQUID EFFLUENTS - SUMMATION BY RELEASE POINT
2009 Unit 2

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Diluted Conc.	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
1. Total Release	Ci	6.96E+00	1.41E+01	4.41E+01	9.61E+00	7.47E+01
2. Avg. Diluted Conc.	uCi/ml	2.09E-06	3.96E-06	1.23E-05	2.91E-06	5.43E-06
Dissolved and Entrained Gases						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Diluted Conc.	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Volume of liquid waste	liters	3.32E+09	3.56E+09	3.58E+09	3.30E+09	1.38E+10
Volume of dil. water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2B
LIQUID EFFLUENTS - CONTINUOUS MODE
2009 Unit 2

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Tritium						
H-3	Ci	6.96E+00	1.41E+01	4.41E+01	9.61E+00	7.47E+01
Totals for Period...	Ci	6.96E+00	1.41E+01	4.41E+01	9.61E+00	7.47E+01
Dissolved and Entrained Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 2B
LIQUID EFFLUENTS - BATCH MODE
2009 Unit 2

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
AG-110M	Ci	0.00E+00	0.00E+00	2.29E-05	0.00E+00	2.29E-05
CO-57	Ci	1.09E-05	1.70E-05	8.07E-06	2.66E-06	3.87E-05
CO-58	Ci	2.48E-03	1.39E-03	8.18E-04	2.59E-03	7.28E-03
CO-60	Ci	2.97E-04	4.38E-04	6.48E-04	1.14E-04	1.50E-03
CS-137	Ci	0.00E+00	0.00E+00	0.00E+00	2.52E-06	2.52E-06
I-131	Ci	0.00E+00	0.00E+00	1.34E-06	0.00E+00	1.34E-06
MN-54	Ci	1.08E-05	1.07E-05	2.16E-05	2.41E-06	4.55E-05
NB-95	Ci	0.00E+00	0.00E+00	0.00E+00	1.36E-06	1.36E-06
SB-124	Ci	0.00E+00	0.00E+00	5.44E-06	0.00E+00	5.44E-06
SB-125	Ci	0.00E+00	0.00E+00	1.34E-05	0.00E+00	1.34E-05
SR-85	Ci	1.53E-05	0.00E+00	4.59E-06	0.00E+00	1.99E-05
TE-125M	Ci	5.36E-04	5.62E-04	4.48E-04	0.00E+00	1.55E-03
Totals for Period...	Ci	3.35E-03	2.42E-03	1.99E-03	2.71E-03	1.05E-02
Tritium						
H-3	Ci	1.56E+02	1.98E+02	3.70E+02	1.08E+02	8.33E+02
Totals for Period...	Ci	1.56E+02	1.98E+02	3.70E+02	1.08E+02	8.33E+02
Dissolved and Entrained Gases						
KR-85	Ci	3.50E-03	0.00E+00	1.05E-03	0.00E+00	4.55E-03
XE-133	Ci	3.70E-05	4.88E-06	5.91E-04	0.00E+00	6.32E-04
Totals for Period...	Ci	3.54E-03	4.88E-06	1.64E-03	0.00E+00	5.18E-03
Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
Unit 2 2009

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
1. Total Release	Ci	1.57E-01	1.30E-01	2.33E-02	1.07E-02	6.27E-01
2. Avg. Release Rate	uCi/sec	1.99E-02	1.65E-02	2.96E-02	1.36E-02	1.99E-02
Iodine-131						
1. Total Release	Ci	0.00E+00	0.00E+00	3.80E-05	5.05E-05	8.85E-05
2. Avg. Release Rate	uCi/sec	0.00E+00	0.00E+00	4.81E-06	6.41E-06	2.81E-06
Particulates Half Life >= 8 days						
1. Total Release	Ci	0.00E+00	0.00E+00	6.86E-07	9.77E-07	1.66E-06
2. Avg. Release Rate	uCi/sec	0.00E+00	0.00E+00	8.71E-08	1.24E-07	5.27E-08
Tritium						
1. Total Release	Ci	9.13E+00	5.94E+00	2.05E+01	1.61E+01	5.16E+01
2. Avg. Release Rate	uCi/sec	1.16E+00	7.53E-01	2.60E+00	2.04E+00	1.64E+00
Gross Alpha						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Release Rate	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1C
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE
Unit 2 2009

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
XE-133	Ci	1.21E-01	1.27E-01	6.44E-02	5.81E-02	3.70E-01
Totals for Period...	Ci	1.21E-01	1.27E-01	6.44E-02	5.81E-02	3.70E-01
Iodines						
I-131	Ci	0.00E+00	0.00E+00	3.80E-05	5.05E-05	8.85E-05
I-132	Ci	0.00E+00	0.00E+00	9.26E-05	0.00E+00	9.26E-05
I-133	Ci	0.00E+00	0.00E+00	1.86E-04	0.00E+00	1.86E-04
Totals for Period...	Ci	0.00E+00	0.00E+00	3.17E-04	5.05E-05	3.67E-04
Particulates Half Life >= 8 days						
CO-58	Ci	0.00E+00	0.00E+00	3.58E-07	5.10E-07	8.68E-07
CS-136	Ci	0.00E+00	0.00E+00	3.28E-07	4.67E-07	7.95E-07
Totals for Period...	Ci	0.00E+00	0.00E+00	6.86E-07	9.77E-07	1.66E-06
Tritium						
H-3	Ci	9.13E+00	5.94E+00	2.05E+01	1.61E+01	5.16E+01
Totals for Period...	Ci	9.13E+00	5.94E+00	2.05E+01	1.61E+01	5.16E+01
Gross Alpha						
GR-A	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL REPORT
TABLE 1C
GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE
Unit 2 2009

REPORT FOR 2009	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Gases						
AR-41	Ci	5.19E-03	2.35E-03	3.15E-03	1.82E-02	2.89E-02
KR-85M	Ci	0.00E+00	0.00E+00	1.74E-04	0.00E+00	1.74E-04
XE-131M	Ci	1.36E-04	5.71E-05	2.46E-04	1.02E-02	1.06E-02
XE-133M	Ci	7.93E-06	0.00E+00	2.59E-03	3.03E-04	2.90E-03
XE-133	Ci	2.69E-02	1.25E-03	1.39E-01	1.88E-02	1.86E-01
XE-135	Ci	2.56E-06	9.34E-07	2.39E-02	1.28E-03	2.52E-02
XE-138	Ci	4.22E-03	0.00E+00	0.00E+00	0.00E+00	4.22E-03
Totals for Period...	Ci	3.65E-02	3.67E-03	1.69E-01	4.88E-02	2.58E-02
Iodines						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Particulates Half Life >= 8 days						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Tritium						
** No Nuclide Activities **		.....	.....	.....	.....	.....
Gross Alpha						
** No Nuclide Activities **		.....	.....	.....	.....	.....

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1
Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) ========== QUARTER 1 ==========

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	1.84E-03	3.86E-02	3.80E-02	4.49E-02	3.74E-02	5.29E-02	0.00E+00	3.86E-02
TEEN	2.00E-03	2.93E-02	2.87E-02	2.81E-02	2.81E-02	3.95E-02	0.00E+00	2.93E-02
CHILD	2.57E-03	3.24E-02	3.20E-02	3.13E-02	3.13E-02	3.57E-02	0.00E+00	3.26E-02
INFANT	6.27E-06	1.39E-02	1.39E-02	1.39E-02	1.39E-02	1.39E-02	0.00E+00	1.39E-02

=== SITE DOSE LIMIT ANALYSIS ========== QUARTER 1 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 1 - Admin. Any Organ	ADULT	GILLI	5.29E-02	3.75E+00	1.41E+00
Qtr 1 - Admin. Total Body	ADULT	TBODY	3.86E-02	1.13E+00	3.43E+00
Qtr 1 - T.Spc. Any Organ	ADULT	GILLI	5.29E-02	5.00E+00	1.06E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	7.07E+01
MN-54	3.65E-01
CO-58	1.14E+01
CO-60	3.64E+00
TE-125M	1.39E+01

Qtr 1 - T.Spc. Total Body	ADULT	TBODY	3.86E-02	1.50E+00	2.57E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.70E+01
MN-54	3.12E-02
CO-58	1.73E+00
CO-60	5.85E-01
TE-125M	6.38E-01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1
Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) ========== QUARTER 2 ==========

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	3.74E-03	3.62E-02	3.57E-02	4.11E-02	3.54E-02	4.59E-02	0.00E+00	3.61E-02
TEEN	3.67E-03	2.74E-02	2.69E-02	2.65E-02	2.66E-02	3.45E-02	0.00E+00	2.73E-02
CHILD	4.39E-03	3.04E-02	3.01E-02	2.95E-02	2.96E-02	3.26E-02	0.00E+00	3.04E-02
INFANT	4.64E-05	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	0.00E+00	1.31E-02

=== SITE DOSE LIMIT ANALYSIS ========== QUARTER 2 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 2 - Admin. Any Organ	ADULT	GILLI	4.59E-02	3.75E+00	1.22E+00
Qtr 2 - Admin. Total Body	ADULT	TBODY	3.61E-02	1.13E+00	3.21E+00
Qtr 2 - T.Spc. Any Organ	ADULT	GILLI	4.59E-02	5.00E+00	9.19E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	7.69E+01
MN-54	3.12E-01
FE-55	1.20E-01
CO-58	5.48E+00
CO-60	4.59E+00
SR-89	5.37E-02
SR-90	1.10E-01
TE-125M	1.25E+01

Qtr 2 - T.Spc. Total Body	ADULT	TBODY	3.61E-02	1.50E+00	2.41E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.78E+01
MN-54	2.47E-02
FE-55	6.23E-02
CO-58	7.71E-01
CO-60	6.86E-01
SR-89	1.22E-02
SR-90	1.12E-01
TE-125M	5.33E-01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1
Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) ========== QUARTER 3 ==========

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	2.35E-03	3.46E-02	3.43E-02	3.65E-02	3.41E-02	3.91E-02	0.00E+00	3.45E-02
TEEN	2.25E-03	2.61E-02	2.58E-02	2.56E-02	2.56E-02	2.93E-02	0.00E+00	2.60E-02
CHILD	2.64E-03	2.89E-02	2.88E-02	2.85E-02	2.85E-02	2.99E-02	0.00E+00	2.90E-02
INFANT	3.37E-05	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	0.00E+00	1.26E-02

=== SITE DOSE LIMIT ANALYSIS ========== QUARTER 3 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 3 - Admin. Any Organ	ADULT	GILLI	3.91E-02	3.75E+00	1.04E+00
Qtr 3 - Admin. Total Body	ADULT	TBODY	3.45E-02	1.13E+00	3.07E+00
Qtr 3 - T.Spc. Any Organ	ADULT	GILLI	3.91E-02	5.00E+00	7.82E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	8.73E+01
MN-54	3.80E-01
FE-55	1.08E-01
CO-58	1.95E+00
CO-60	4.12E+00
SR-89	4.82E-02
SR-90	9.88E-02
AG-110M	1.15E-02
TE-125M	6.03E+00
I-131	1.01E-04

Qtr 3 - T.Spc. Total Body	ADULT	TBODY	3.45E-02	1.50E+00	2.30E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.88E+01
MN-54	2.68E-02
FE-55	4.96E-02
CO-58	2.45E-01
CO-60	5.47E-01
SR-89	9.76E-03
SR-90	8.94E-02
AG-110M	1.89E-05

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Nuclide	Percentage
TE-125M	2.29E-01
I-131	2.49E-04

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LIQUID DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1
Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) ========== QUARTER 4 ==========

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	2.94E-03	3.93E-02	3.63E-02	3.71E-02	3.66E-02	5.01E-02	0.00E+00	3.90E-02
TEEN	2.97E-03	3.03E-02	2.72E-02	2.81E-02	2.76E-02	3.67E-02	0.00E+00	2.93E-02
CHILD	3.60E-03	3.31E-02	3.03E-02	3.11E-02	3.06E-02	3.36E-02	0.00E+00	3.19E-02
INFANT	2.13E-05	1.34E-02	1.34E-02	1.34E-02	1.34E-02	1.34E-02	0.00E+00	1.34E-02

=== SITE DOSE LIMIT ANALYSIS ========== QUARTER 4 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 4 - Admin. Any Organ	ADULT	GILLI	5.01E-02	3.75E+00	1.34E+00
Qtr 4 - Admin. Total Body	ADULT	TBODY	3.90E-02	1.13E+00	3.47E+00
Qtr 4 - T.Spc. Any Organ	ADULT	GILLI	5.01E-02	5.00E+00	1.00E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	7.23E+01
MN-54	1.21E-01
FE-55	5.42E-02
CO-58	1.76E+01
CO-60	2.07E+00
SR-89	2.42E-02
SR-90	4.96E-02
NB-95	7.64E+00
CS-137	9.51E-02

Qtr 4 - T.Spc. Total Body	ADULT	TBODY	3.90E-02	1.50E+00	2.60E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.29E+01
MN-54	9.67E-03
FE-55	2.83E-02
CO-58	2.50E+00
CO-60	3.12E-01
SR-89	5.56E-03
SR-90	5.10E-02
NB-95	8.70E-04
CS-137	4.14E+00

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LIQUID DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1
Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) ========== ANNUAL 2009 =========

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	4.70E-03	1.46E-01	1.44E-01	1.58E-01	1.43E-01	1.80E-01	0.00E+00	1.46E-01
TEEN	5.11E-03	1.11E-01	1.08E-01	1.07E-01	1.07E-01	1.34E-01	0.00E+00	1.10E-01
CHILD	6.54E-03	1.23E-01	1.21E-01	1.19E-01	1.19E-01	1.29E-01	0.00E+00	1.22E-01
INFANT	1.34E-05	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	0.00E+00	5.27E-02

=== SITE DOSE LIMIT ANALYSIS ========== ANNUAL 2009 =========

Annual - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
2009 - Admin. Any Organ	ADULT	GILLI	1.80E-01	7.50E+00	2.40E+00
2009 - Admin. Total Body	ADULT	TBODY	1.46E-01	2.25E+00	6.49E+00
2009 - T.Spc. Any Organ	ADULT	GILLI	1.80E-01	1.00E+01	1.80E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	7.93E+01
MN-54	3.25E-01
CO-58	7.03E+00
CO-60	3.85E+00
NB-95	1.09E+00
AG-110M	4.65E-03
TE-125M	8.42E+00
I-131	4.10E-05
CS-137	1.35E-02

2009 - T.Spc. Total Body	ADULT	TBODY	1.46E-01	3.00E+00	4.87E+00

Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.76E+01
MN-54	2.49E-02
CO-58	9.58E-01
CO-60	5.57E-01
NB-95	1.18E-04
AG-110M	8.33E-06
TE-125M	3.48E-01
I-131	1.10E-04
CS-137	5.63E-01

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== I&P DOSE LIMIT ANALYSIS ========== QUARTER 1 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 1 - Admin. Any Organ	CHILD	LIVER	9.68E-04	5.63E+00	1.72E-02
Qtr 1 - Admin. Total Body	CHILD	TBODY	9.68E-04	5.25E+00	1.84E-02
Qtr 1 - T.Spc. Any Organ	CHILD	LIVER	9.68E-04	7.50E+00	1.29E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

Qtr 1 - T.Spc. Total Body	CHILD	TBODY	9.68E-04	7.50E+00	1.29E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== NG DOSE LIMIT ANALYSIS ========== QUARTER 1 ==========

Quartr - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
Qtr 1 - Admin. Gamma	1.36E-05	3.75E+00	3.62E-04
Qtr 1 - Admin. Beta	6.75E-06	7.50E+00	9.00E-05
Qtr 1 - T.Spc. Gamma	1.36E-05	5.00E+00	2.72E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	2.06E+01
XE-138	1.66E+01
XE-135	3.12E-01
XE-133M	2.21E-03
XE-131M	1.80E-02
XE-133	6.25E+01

Qtr 1 - T.Spc. Beta	6.75E-06	1.00E+01	6.75E-05

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	3.59E+00
XE-138	4.24E+00
XE-135	1.98E-01
XE-133M	4.96E-03
XE-131M	6.35E-02
XE-133	9.19E+01

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== I&P DOSE LIMIT ANALYSIS ========== QUARTER 2 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 2 - Admin. Any Organ	CHILD	GILLI	3.06E-03	5.63E+00	5.44E-02
Qtr 2 - Admin. Total Body	CHILD	TBODY	3.06E-03	5.25E+00	5.83E-02
Qtr 2 - T.Spc. Any Organ	CHILD	GILLI	3.06E-03	7.50E+00	4.08E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.00E+02
CR-51	2.76E-04
TE-123M	0.00E+00

Qtr 2 - T.Spc. Total Body	CHILD	TBODY	3.06E-03	7.50E+00	4.08E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.00E+02
CR-51	7.74E-05
TE-123M	0.00E+00

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== NG DOSE LIMIT ANALYSIS ========== QUARTER 2 ==========

Quartr - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
Qtr 2 - Admin. Gamma	1.25E-05	3.75E+00	3.34E-04
Qtr 2 - Admin. Beta	5.68E-06	7.50E+00	7.57E-05
Qtr 2 - T.Spc. Gamma	1.25E-05	5.00E+00	2.50E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	4.30E+01
XE-135	1.66E-03
XE-131M	8.26E-03
XE-133	5.70E+01

Qtr 2 - T.Spc. Beta	5.68E-06	1.00E+01	5.68E-05

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	8.20E+00
XE-135	1.15E-03
XE-131M	3.18E-02
XE-133	9.18E+01

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== I&P DOSE LIMIT ANALYSIS ========== QUARTER 3 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 3 - Admin. Any Organ	INFANT	THYROID	1.52E-02	5.63E+00	2.70E-01
Qtr 3 - Admin. Total Body	CHILD	TBODY	2.66E-03	5.25E+00	5.06E-02
Qtr 3 - T.Spc. Any Organ	INFANT	THYROID	1.52E-02	7.50E+00	2.03E-01

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Grs/Goat/Milk (GMILK)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.35E+01
CO-58	1.07E-04
I-131	8.17E+01
I-132	7.30E-03
I-133	4.78E+00
CS-136	3.87E-05

Qtr 3 - T.Spc. Total Body	CHILD	TBODY	2.66E-03	7.50E+00	3.54E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.96E+01
CO-58	1.08E-03
I-131	3.53E-01
I-132	2.85E-03
I-133	2.88E-02
CS-136	1.11E-02

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== NG DOSE LIMIT ANALYSIS ========== QUARTER 3 ==========

Quartr - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
Qtr 3 - Admin. Gamma	2.35E-05	3.75E+00	6.26E-04
Qtr 3 - Admin. Beta	1.03E-05	7.50E+00	1.38E-04
Qtr 3 - T.Spc. Gamma	2.35E-05	5.00E+00	4.69E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	3.05E+01
KR-85M	1.06E-01
XE-135	2.27E+01
XE-133M	4.19E-01
XE-131M	1.90E-02
XE-133	4.62E+01

Qtr 3 - T.Spc. Beta	1.03E-05	1.00E+01	1.03E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	6.00E+00
KR-85M	9.42E-02
XE-135	1.62E+01
XE-133M	1.06E+00
XE-131M	7.52E-02
XE-133	7.65E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== I&P DOSE LIMIT ANALYSIS ========== QUARTER 4 ==========

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 4 - Admin. Any Organ	INFANT	THYROID	1.71E-02	5.63E+00	3.05E-01
Qtr 4 - Admin. Total Body	CHILD	TBODY	1.98E-03	5.25E+00	3.77E-02
Qtr 4 - T.Spc. Any Organ	INFANT	THYROID	1.71E-02	7.50E+00	2.29E-01

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Grs/Goat/Milk (GMILK)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	8.93E+00
CO-58	1.35E-04
I-131	9.11E+01
CS-136	4.88E-05

Qtr 4 - T.Spc. Total Body	CHILD	TBODY	1.98E-03	7.50E+00	2.64E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.94E+01
CO-58	2.06E-03
I-131	5.95E-01
CS-136	2.11E-02

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== NG DOSE LIMIT ANALYSIS ========== QUARTER 4 ==========

Quartr - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
Qtr 4 - Admin. Gamma	3.22E-05	3.75E+00	8.59E-04
Qtr 4 - Admin. Beta	2.95E-04	7.50E+00	3.93E-03
Qtr 4 - T.Spc. Gamma	3.22E-05	5.00E+00	6.44E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	5.67E+01
KR-85	3.24E+01
XE-135	8.86E-01
XE-133M	3.57E-02
XE-131M	2.89E-01
XE-133	9.71E+00

Qtr 4 - T.Spc. Beta	2.95E-04	1.00E+01	2.95E-03

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	5.37E-01
KR-85	9.86E+01
XE-135	3.05E-02
XE-133M	4.34E-03
XE-131M	5.51E-02
XE-133	7.76E-01

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== I&P DOSE LIMIT ANALYSIS ========== ANNUAL 2009 =========

Annual - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
2009 - Admin. Any Organ	INFANT	THYROID	3.55E-02	1.13E+01	3.15E-01
2009 - Admin. Total Body	CHILD	TBODY	8.67E-03	1.05E+01	8.25E-02
2009 - T.Spc. Any Organ	INFANT	THYROID	3.55E-02	1.50E+01	2.37E-01

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Grs/Goat/Milk (GMILK)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.90E+01
CR-51	6.50E-06
CO-58	1.11E-04
I-131	7.90E+01
I-132	3.13E-03
I-133	2.05E+00
CS-136	4.02E-05
TE-123M	0.00E+00

2009 - T.Spc. Total Body	CHILD	TBODY	8.67E-03	1.50E+01	5.78E-02

Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.97E+01
CR-51	2.73E-05
CO-58	7.99E-04
I-131	2.44E-01
I-132	8.75E-04
I-133	8.84E-03
CS-136	8.23E-03
TE-123M	0.00E+00

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GASEOUS DOSE SUMMARY

2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== NG DOSE LIMIT ANALYSIS ========== ANNUAL 2009 =========

Annual - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
2009 - Admin. Gamma	8.18E-05	7.50E+00	1.09E-03
2009 - Admin. Beta	3.18E-04	1.50E+01	2.12E-03
2009 - T.Spc. Gamma	8.18E-05	1.00E+01	8.18E-04

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	4.11E+01
KR-85	1.28E+01
XE-138	2.76E+00
KR-85M	3.03E-02
XE-135	6.92E+00
XE-133M	1.35E-01
XE-131M	1.23E-01
XE-133	3.62E+01

2009 - T.Spc. Beta	3.18E-04	2.00E+01	1.59E-03

Receptor: 4 Composite Crit. Receptor - NG
Distance: 0.00 (meters) Compass Point: NA

Nuclide	Percentage
AR-41	9.16E-01
KR-85	9.15E+01
XE-138	9.00E-02
KR-85M	3.07E-03
XE-135	5.61E-01
XE-133M	3.85E-02
XE-131M	5.55E-02
XE-133	6.80E+00

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2009 Unit 1

Report for: 2009
Unit Range - From: 1 To: 1

=== MAXIMUM DOSE ANALYSIS ================================ ANNUAL 2009 =========

Dose Type	Age Group	Organ	Dose (mrem)
Any Organ	ADULT	GILLI	1.85E-01

Liquid Receptor: 0 Liquid Receptor
Gaseous Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA

Liquid Dose: 1.80E-01 % of Total: 9.71E+01
Critical Pathway: Fresh Water Fish - Sport (FFSP)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	7.93E+01
MN-54	3.25E-01
CO-58	7.03E+00
CO-60	3.85E+00
NB-95	1.09E+00
AG-110M	4.65E-03
TE-125M	8.42E+00
I-131	4.10E-05
CS-137	1.35E-02

Gaseous Dose: 5.25E-03 % of Total: 2.84E+00
Critical Pathway: Vegetation (VEG)
Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	9.99E+01
CR-51	2.44E-04
CO-58	2.94E-03
I-131	6.87E-02
I-132	1.27E-03
I-133	1.29E-02
CS-136	1.17E-03
TE-123M	0.00E+00

=== MAXIMUM DOSE ANALYSIS ================================ ANNUAL 2009 =========

Dose Type	Age Group	Organ	Dose (mrem)
Total Body	ADULT	TBODY	1.51E-01

Liquid Receptor: 0 Liquid Receptor
Gaseous Receptor: 5 Composite Crit. Receptor - IP
Distance: 0.00 (meters) Compass Point: NA