Nuclear Fuel Services, Inc.
P.O. Box 337, MS 123
Erwin, TN 37650

(423) 743-9141

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

21G-97-0022
GOV-01-55-03
ACF-97-039

February 25, 1997

Mr. Luis A. Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323

REFERENCE: ***DOCKET 70-143/SNM-124***

SUBJECT: ***BI-ANNUAL EFFLUENT MONITORING REPORT (JULY-DECEMBER, 1996)***

Dear Mr. Reyes:

In accordance with the requirements set forth in 10 CFR, Part 70.59, Nuclear Fuel Services, Inc., (NFS) submits the attached reports (Attachment A - Radioactivity in Effluent Liquid and Attachment B - Radioactivity in Effluent Air) of its effluent monitoring for the period July-December, 1996.

If you have any questions or need further information, please contact me or Ms. Marie Moore, Environmental Manager, at (423) 743-1737. Please reference our unique document identification number (21G-97-0022) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

T. S. Baer, PhD
Vice President
Safety and Regulatory

TSB/CAH/rcy

Attachment

cc: Director, Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. Michael F. Weber, Chief
Licensing Branch, NMSS
Mail Stop T8 D14
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Mr. Bill Gleaves,
Project Inspector
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW
Suite 2900
Atlanta, GA 30323

IE04

ATTACHMENT A
To Letter Dated February 25, 1997
T. S. Baer to Mr. Luis A. Reyes

Report of Radioactivity in Effluent Liquid
for the period
July - December, 1996

Nuclear Fuel Services, Inc.

Radioactivity in Effluent Liquid, July 1, 1996 to December 31, 1996

2/14/97

	Total Volume (l)	Concentration (µ Ci/ml)	Error Estimate (µ Ci/ml)	LLD (µ Ci/ml)	Quantity Released (Ci)	Quantity Released (g)	Percent of ECL*
Sewer							
Pu-238	15,842,442	2.85E-11	2.04E-10	3.73E-10	1.71E-06	2.84E-09	0%
Pu-239	15,842,442	1.21E-11	1.09E-10	1.99E-10	7.25E-07	3.09E-06	0%
Th-228	15,842,442	8.11E-11	4.87E-10	8.50E-10	4.86E-06	1.57E-09	0%
Th-230	15,842,442	2.62E-10	1.99E-10	2.70E-10	1.57E-05	2.05E-04	0%
Th-232	15,842,442	7.36E-12	1.22E-10	2.66E-10	4.42E-07	1.07E+00	0%
U-234	15,842,442	4.61E-08	2.89E-09	2.05E-10	2.76E-03	1.17E-01	2%
U-235	15,842,442	1.55E-09	3.39E-10	1.83E-10	9.27E-05	1.13E+01	0%
U-238	15,842,442	6.85E-09	7.03E-10	1.81E-10	4.10E-04	8.24E+02	0%
WWTF							
Ce-144	740,592	0.00E+00	0.00E+00	5.07E-08	0.00E+00	0.00E+00	0%
Co-60	740,592	0.00E+00	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0%
Cs-137	740,592	0.00E+00	0.00E+00	8.98E-09	0.00E+00	0.00E+00	0%
Mn-54	740,592	0.00E+00	0.00E+00	8.65E-09	0.00E+00	0.00E+00	0%
Pu-238	740,592	-4.31E-11	2.09E-10	3.86E-10	-1.21E-07	-1.87E-09	0%
Pu-239	740,592	-3.31E-11	1.34E-10	2.76E-10	-9.27E-08	-3.94E-07	0%
Tc-99	1,536,153	9.09E-09	1.17E-08	1.93E-08	5.29E-05	8.28E-04	0%
Th-228	1,536,153	2.50E-10	3.80E-10	5.99E-10	1.45E-06	4.69E-10	0%
Th-230	1,536,153	2.64E-10	1.72E-10	2.27E-10	1.53E-06	2.01E-05	0%
Th-232	1,536,153	1.63E-11	1.31E-10	2.57E-10	9.48E-08	2.30E-01	0%
U-234	1,536,153	9.45E-08	5.48E-09	2.37E-10	5.50E-04	2.33E-02	31%
U-235	1,536,153	2.16E-09	4.30E-10	2.40E-10	1.26E-05	1.54E+00	1%
U-238	1,536,153	7.23E-09	7.81E-10	2.29E-10	4.21E-05	3.32E+01	2%
Banner Spring Branch							
Pu-238	495,949,730	1.24E-11	1.39E-10	2.60E-10	2.33E-05	3.60E-07	0%
Pu-239	495,949,730	1.76E-10	1.28E-10	1.56E-10	3.31E-04	1.41E-03	1%
Th-228	495,949,730	1.82E-10	3.02E-10	5.01E-10	3.42E-04	1.10E-07	0%
Th-230	495,949,730	1.90E-10	1.46E-10	2.08E-10	3.57E-04	4.57E-03	0%
Th-232	495,949,730	1.10E-11	1.20E-10	2.23E-10	2.07E-05	5.01E+01	0%
U-234	495,949,730	1.21E-08	9.74E-10	1.76E-10	2.28E-02	9.65E-01	4%
U-235	495,949,730	3.68E-10	1.70E-10	1.75E-10	6.91E-04	6.45E+01	0%
U-238	495,949,730	2.13E-09	3.36E-10	1.74E-10	3.99E-03	3.15E+03	1%

*ECL: Effluent Concentration Limit from 10-CFR-20, Appendix B.

ATTACHMENT B
To Letter Dated February 25, 1997
T. S. Baer to Mr. Luis A. Reyes

Report of Radioactivity in Effluent Air
for the period
July - December, 1996

Nuclear Fuel Services, Inc.

Radioactivity in Effluent Air, July 1, 1996 to December 31, 1996 2/14/97

	Total Volume (m³)	Concentration (µCi/ml)	Error Estimate (± µCi/ml)	LLD (µCi/ml)	Quantity Released (Ci)	Quantity Released (g)	Percent of ECL*
Main Stack 416							
9.13 m³/sec							
Th-228	146,222,359	3.97E-16	1.98E-16	6.71E-16	5.77E-08	7.04E-11	1%
Th-230	146,222,359	1.99E-16	9.91E-17	3.36E-16	2.88E-08	1.43E-05	0%
Th-232	146,222,359	3.97E-16	1.98E-16	6.71E-16	5.77E-08	5.29E-01	3%
U-234	146,222,359	6.17E-14	3.08E-14	1.04E-13	8.96E-06	1.44E-03	59%
U-235	146,222,359	1.39E-15	6.94E-16	2.35E-15	2.02E-07	9.35E-02	1%
U-236	146,222,359	3.31E-17	1.65E-17	5.60E-17	4.81E-09	7.41E-05	0%
U-238	146,222,359	2.18E-15	1.09E-15	3.69E-15	3.17E-07	9.47E-01	2%
Stack 186 Bldg. 131							
1.79 m³/sec							
U-234	28,498,031	1.07E-15	5.17E-15	1.74E-14	3.05E-06	4.89E-03	2%
U-238	28,498,031	2.06E-15	1.00E-14	3.38E-14	5.93E-06	1.77E-01	3%
Stack 234 Bldg. 234							
0.30 m³/sec							
Am-241	3,235,108	3.75E-16	4.29E-16	1.44E-15	1.21E-09	3.54E-10	2%
Pu-236	3,235,108	7.35E-17	8.40E-17	2.83E-16	2.38E-10	1.39E-11	0%
Pu-239	3,235,108	8.10E-16	9.26E-16	3.12E-15	2.62E-09	4.21E-06	4%
Pu-240	3,235,108	2.72E-16	3.11E-16	1.05E-15	8.81E-10	3.87E-09	1%
Pu-241	3,235,108	2.37E-15	2.71E-15	9.14E-15	7.67E-09	7.46E-11	0%
Stack 27 Bldg. 234							
2.10 m³/sec							
Am-241	33,364,400	8.61E-16	4.29E-16	1.44E-15	2.87E-08	8.36E-09	4%
Pu-236	33,364,400	1.69E-16	8.40E-17	2.83E-16	5.63E-09	3.29E-10	1%
Pu-239	33,364,400	1.86E-15	9.26E-16	3.12E-15	6.20E-08	9.97E-07	9%
Pu-240	33,364,400	6.26E-16	3.12E-16	1.05E-15	2.09E-08	9.15E-08	3%
Pu-241	33,364,400	5.45E-15	2.71E-15	9.14E-15	1.82E-07	1.76E-09	1%
Stack 28 Bldg. 234							
1.38 m³/sec							
Am-241	21,940,190	2.79E-16	4.27E-16	1.44E-15	6.11E-09	1.78E-09	1%
Pu-236	21,940,190	5.48E-17	8.37E-17	2.82E-16	1.20E-09	7.00E-11	0%
Pu-239	21,940,190	6.02E-16	9.23E-16	3.11E-15	1.32E-08	2.12E-07	3%
Pu-240	21,940,190	2.02E-16	3.11E-16	1.05E-15	4.44E-09	1.95E-08	1%
Pu-241	21,940,190	1.76E-15	2.70E-15	9.11E-15	3.87E-08	3.75E-10	0%
Stack 332 Bldg. 139							
0.92 m³/sec							
Th-228	14,704,366	4.23E-15	6.98E-16	3.02E-15	6.22E-08	7.59E-11	21%

*ECL: Effluent Concentration Limit from 10-CFR-20, Appendix B, percentage of the stack is provided for reference only. The percentage reported does not account for the atmospheric dispersion that occurs prior to the effluent exiting the site. Actual concentrations at the site boundary are significantly lower. Regulatory compliance is demonstrated by dose assessment and not by the percent of ECL.

Radioactivity in Effluent Air, July 1, 1996 to December 31, 1996 2/14/97

	Total Volume (m^3)	Concentration ($\mu Ci/ml$)	Error Estimate ($\pm \mu Ci/ml$)	LLD ($\mu Ci/ml$)	Quantity Released (Ci)	Quantity Released (g)	Percent of ECL[1]
Stack 332 Bldg. 120							
0.92 m^3/sec							
Th-230	14,704,366	1.97E-15	4.17E-16	1.41E-15	2.89E-08	1.43E-08	7%
Th-232	14,704,366	4.15E-15	8.81E-16	2.97E-15	6.11E-08	5.81E-01	69%
U-234	14,704,366	3.35E-14	7.09E-15	2.39E-14	4.92E-07	7.88E-05	67%
U-235	14,704,366	5.47E-15	1.16E-15	3.91E-15	8.04E-08	3.72E-02	9%
U-238	14,704,366	2.37E-14	5.02E-15	1.69E-14	3.48E-07	1.04E+00	39%
Stack 333 Bldg. 110							
0.46 m^3/sec							
Th-228	7,205,810	6.11E-16	9.83E-16	3.33E-15	3.68E-09	4.60E-12	3%
Th-230	7,205,810	2.38E-16	4.58E-16	1.55E-15	1.71E-09	8.49E-08	1%
Th-232	7,205,810	5.02E-16	9.66E-16	3.27E-15	3.62E-09	3.32E-02	8%
U-234	7,205,810	4.04E-15	7.78E-15	2.63E-14	2.91E-08	4.67E-06	8%
U-235	7,205,810	6.61E-16	1.27E-15	4.30E-15	4.76E-09	2.20E-03	1%
U-238	7,205,810	2.86E-15	5.51E-15	1.86E-14	2.06E-08	6.16E-02	5%
Stack 376 Bldg. 301							
3.17 m^3/sec							
U-234	50,317,838	6.02E-15	2.19E-14	7.38E-14	3.03E-07	4.88E-05	7%
U-235	50,317,838	9.17E-17	3.33E-16	1.12E-15	4.62E-09	2.14E-03	0%
U-238	50,317,838	3.06E-16	1.11E-17	3.74E-17	1.54E-10	2.37E-06	0%
U-238	50,317,838	1.83E-16	6.67E-16	2.25E-17	9.23E-11	2.76E-04	0%
Stack 421 Bldg. 100							
0.14 m^3/sec							
Th-228	2,214,285	3.18E-16	6.13E-16	2.06E-15	7.06E-10	8.81E-13	2%
Th-230	2,214,285	1.47E-16	2.83E-16	9.52E-16	3.25E-10	1.61E-08	0%
Th-232	2,214,285	3.18E-16	6.13E-16	2.06E-15	7.06E-10	6.47E-03	5%
U-234	2,214,285	4.50E-15	8.68E-15	2.91E-14	9.98E-09	1.60E-06	9%
U-235	2,214,285	3.84E-16	7.39E-16	2.48E-15	8.50E-10	3.93E-04	1%
U-238	2,214,285	4.90E-16	9.44E-16	3.17E-17	1.08E-11	1.67E-07	0%
U-238	2,214,285	2.07E-15	3.98E-15	1.34E-14	4.57E-09	1.37E-02	3%
Stack 647 Bldg. 100							
0.92 m^3/sec							
Th-228	14,693,632	1.58E-16	5.58E-16	1.88E-15	2.29E-09	2.80E-12	1%
Th-230	14,693,632	7.20E-17	2.58E-16	8.67E-16	1.06E-09	5.24E-08	0%
Th-232	14,693,632	1.58E-16	5.58E-16	1.88E-15	2.29E-09	2.10E-02	3%
U-234	14,693,632	2.20E-15	7.89E-15	2.65E-14	3.24E-08	5.19E-06	4%

[1] ECL: Effluent Concentration Limit from 10-CFR-20, Appendix B, percentage at the stack is provided for reference only. The percentage reported does not account for the atmospheric dispersion that occurs prior to the effluent exiting the site. Actual concentrations at the site boundary are significantly lower. Regulatory compliance is demonstrated by dose assessment and not by the percent of ECL.

Radioactivity in Effluent Air, July 1, 1996 to December 31, 1996 2/14/97

	Total Volume (m^3)	Concentration ($\mu Ci/ml$)	Error Estimate ($\pm \mu Ci/ml$)	LLD ($\mu Ci/ml$)	Quantity Released (Ci)	Quantity Released (g)	Percent of ECL[1]
Stack 647 Bldg. 100							
6.82 m³/sec							
U-235	14,663,632	1.86E-16	6.79E-16	2.28E-15	2.78E-09	1.28E-03	0%
U-236	14,663,632	2.40E-16	8.60E-16	2.89E-17	3.59E-11	5.43E-07	0%
U-238	14,663,632	1.01E-15	3.62E-15	1.22E-14	1.49E-08	4.44E-02	2%
Stack 664 Bldg. 110							
6.36 m³/sec							
Am-241	5,586,950	1.22E-16	4.33E-16	1.46E-15	6.80E-10	1.98E-10	1%
Pu-236	5,586,950	2.36E-17	8.46E-17	2.86E-16	1.33E-10	7.79E-12	0%
Pu-239	5,586,950	2.63E-16	9.36E-16	3.15E-15	1.47E-09	2.36E-06	1%
Pu-240	5,586,950	8.84E-17	3.15E-16	1.06E-15	4.94E-10	2.17E-09	0%
Pu-241	5,586,950	7.70E-16	2.74E-15	9.24E-15	4.30E-09	4.18E-11	0%
Stack 683 Bldg. 234							
6.14 m³/sec							
Am-241	2,251,816	4.92E-16	4.26E-16	1.44E-15	1.11E-09	3.23E-10	2%
Pu-236	2,251,816	9.64E-17	6.36E-17	2.82E-16	2.17E-10	1.27E-11	0%
Pu-239	2,251,816	1.06E-15	9.24E-16	3.11E-15	2.39E-09	3.86E-06	5%
Pu-240	2,251,816	3.57E-16	3.11E-16	1.05E-15	8.05E-10	3.53E-09	2%
Pu-241	2,251,816	3.11E-15	2.71E-15	9.12E-15	7.01E-09	6.80E-11	0%
Stack 699 Bldg. 110							
4.48 m³/sec							
U-234	71,291,828	7.04E-15	1.79E-14	6.01E-14	5.02E-07	8.04E-05	14%
U-235	71,291,828	1.07E-16	2.72E-16	9.15E-16	7.64E-09	3.54E-03	0%
U-236	71,291,828	3.67E-16	9.06E-16	3.05E-17	2.55E-10	3.93E-06	0%
U-238	71,291,828	2.14E-16	5.44E-16	1.83E-17	1.53E-10	4.56E-04	0%
Stack 616 Bldg. 302							
6.37 m³/sec							
U-234	5,892,251	5.65E-15	1.78E-14	6.00E-14	3.33E-08	5.34E-06	5%
U-235	5,892,251	2.63E-16	8.29E-16	2.79E-15	1.55E-09	7.17E-04	0%
U-236	5,892,251	7.11E-16	2.24E-17	7.55E-17	4.19E-11	6.46E-07	0%
U-238	5,892,251	1.19E-15	3.74E-15	1.26E-14	6.99E-09	2.09E-02	1%
Stack 646 Bldg. 110							
9.42 m³/sec							
Th-228	6,634,860	2.69E-16	9.15E-16	3.09E-15	1.78E-09	2.17E-12	1%
Th-230	6,634,860	1.25E-16	4.26E-16	1.44E-15	8.29E-10	4.10E-08	0%
Th-232	6,634,860	2.64E-16	9.00E-16	3.04E-15	1.75E-09	1.81E-02	4%
U-234	6,634,860	2.12E-15	7.24E-15	2.44E-14	1.41E-08	2.26E-06	4%

[1] *ECL: Effluent Concentration Limit from 10-CFR-20, Appendix B, percentage of the stack is provided for reference only. The percentage reported does not account for the atmospheric dispersion that occurs prior to the effluent exiting the site. Actual concentrations at the site boundary are significantly lower. Regulatory compliance is demonstrated by dose assessment and not by the percent of ECL.*

	Total Volume (m³)	Concentration (µCi/ml)	Error Estimate (± µCi/ml)	LLD (µCi/ml)	Quantity Released (Ci)	Quantity Released (g)	Percent of ECL[1]
Stack 846 Bldg. 110							
8.42 m³/sec							
U-235	6,634,860	3.47E-16	1.16E-15	3.99E-15	2.30E-09	1.07E-03	1%
U-238	6,634,860	1.50E-15	5.13E-15	1.73E-14	9.96E-09	2.99E-02	3%
Stack 849 Bldg. 836							
8.64 m³/sec							
U-234	10,203,784	1.97E-15	4.73E-15	1.60E-14	2.01E-08	3.22E-06	2%
U-235	10,203,784	8.18E-16	1.96E-15	6.63E-15	8.35E-09	3.86E-03	1%
U-238	10,203,784	5.39E-15	1.29E-14	4.37E-14	5.50E-08	1.84E-01	5%
Stack 867 Pond 4							
11.11 m³/sec							
U-234	176,549,927	1.30E-14	4.81E-15	1.62E-14	2.30E-06	3.69E-04	16%
U-235	176,549,927	5.41E-15	2.00E-15	6.74E-15	9.55E-07	4.42E-01	6%
U-238	176,549,927	3.57E-14	1.31E-14	4.44E-14	6.29E-06	1.86E+01	38%

[1] *ECL: Effluent Concentration Limit from 10-CFR-20, Appendix B, percentage at the stack is provided for reference only. The percentage reported does not account for the atmospheric dispersion that occurs prior to the effluent exiting the site. Actual concentrations at the site boundary are significantly lower. Regulatory compliance is demonstrated by dose assessment and not by the percent of ECL.*