ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

April 27, 2007

Mr. Jim Kottan
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

SUBJECT: INTERIM REPORT FOR COMPLETED ANALYSES FOR SAMPLES FROM SET TWENTY, FROM THE INDIAN POINT POWER STATION, BUCHANAN, NEW YORK [INSPECTION REPORT NO. 050-247/2006-007] [RFTA NO. 06-001]

Dear Mr. Kottan:

The Oak Ridge Institute for Science and Education (ORISE) received set 20, consisting of 10 water samples, associated with the Indian Point Power Station on January 29, 2007. Sample analysis was initiated based on your previous direction for handling samples from this licensee. Sample identification and collection data for the samples addressed in this report are presented in Table 1. Gamma spectroscopy, the hard-to-detect betas (iron-55, nickel-63, and tritium), technetium-99, total radiostrontium, alpha spectroscopy, plutonium-241, and carbon-14 data are provided in Tables 2 through 8, respectively. The pertinent procedure references are provided in each specific table.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request. Additional reports will follow after the completion of the requested analyses.

ORISE has removed the Ni-59 data due to problems with the calculation associated with the concentration of this radionuclide. ORISE is discontinuing the reporting of Ni-59 data until this problem can be resolved.

My contact information is listed below. You may also contact Wade Ivey at 865.576.9184 with any questions or comments.

Sincerely,

Dale Condra

Dale Condra, Manager
Laboratory

RDC:WPI:km

Enclosures

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TABLE 1

SAMPLE IDENTIFICATIONS AND COLLECTION DATA INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Collection Date	Collection Time
1697W0124[a]	MW-30 74' 006	1/16/2007	13:40
1697M0073[b]	MW-30 74' 006	1/16/2007	13:40
1697W0125	MW-30 88' 003	1/16/2007	13:50
1697M0074	MW-30 88' 003	1/16/2007	13:50
1697W0126	MW-31 53' (002)	1/18/2007	9:13
1697M0075	MW-31 53' (002)	1/18/2007	9:13
1697W0127	MW-31 67' (002)	1/18/2007	9:25
1697M0076	MW-31 67' (002)	1/18/2007	9:25
1697W0128	MW-31 89' (002)	1/18/2007	9:16
1697M0077	MW-31 89' (002)	1/18/2007	9:16
1697W0129	MW-32 62' (001)	1/19/2007	9:30
1697M0078	MW-32 62' (001)	1/19/2007	9:30
1697W0130	MW-32 92' (001)	1/19/2007	9:40
1697M0079	MW-32 92' (001)	1/19/2007	9:40
1697W0131	MW-32 140' (001)	1/19/2007	9:45
1697M0080	MW-32 140' (001)	1/19/2007	9:45
1697W0132	MW-32 160' (001)	1/19/2007	9:50
1697M0081	MW-32 160' (001)	1/19/2007	9:50
1697W0133	MW-32 197' (001)	1/19/2007	9:55
1697M0082	MW-32 197' (001)	1/19/2007	9:55

[a]The W in the ORISE sample identification represents a water matrix.

[b]The M in the ORISE sample identification represents the filtered fraction of the preceding water sample.

TABLE 2

CONCENTRATIONS OF SELECTED GAMMA EMITTING RADIONUCLIDES IN WATER SAMPLES BY GAMMA SPECTROSCOPY CP1, REVISION 15 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations[a] (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1697W0124	MW-30 74' 006	2.2 ± 3.3[b]	2.2 ± 2.9	-1.0 ± 3.1	1.2 ± 2.8
1697W0125	MW-30 88' 003	0.6 ± 2.4	1.2 ± 2.3	0.6 ± 2.4	0.3 ± 2.2
1697W0126	MW-31 53' (002)	1.2 ± 2.9	2.6 ± 3.1	0.8 ± 3.0	2.3 ± 5.7
1697W0127	MW-31 67' (002)	0.3 ± 3.1	4.1 ± 3.0	3.6 ± 3.8	1.0 ± 2.6
1697W0128	MW-31 89' (002)	-2.6 ± 2.6	1.4 ± 2.4	0.0[c] ± 2.3	0.6 ± 2.1
1697W0129	MW-32 62' (001)	-0.8 ± 3.7	0.5 ± 3.3	1.8 ± 3.9	1.3 ± 2.9
1697W0130	MW-32 92' (001)	0.5 ± 3.0	3.9 ± 3.0	1.0 ± 3.1	0.7 ± 5.5
1697W0131	MW-32 140' (001)	-2.5 ± 3.2	2.6 ± 3.2	-0.4 ± 3.3	4.9 ± 4.5
1697W0132	MW-32 160' (001)	-0.1 ± 2.3	1.1 ± 2.8	2.0 ± 2.4	-0.7 ± 2.1
1697W0133	MW-32 197' (001)	-0.4 ± 3.4	1.9 ± 3.3	1.6 ± 3.4	2.4 ± 2.4

[a]The range of MDCs for the selected radionuclides is 3.5 pCi/L to 5.9 pCi/L.

[b]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

[c]Zero values are due to rounding.

TABLE 3

CONCENTRATIONS OF HARD-TO-DETECT BETA EMITTING RADIONUCLIDES IN WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS CP4, REVISION 3 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations[a] (pCi/L)		
		Fe-55[b]	Ni-63[c]	H-3[d]
1697W0124	MW-30 74' 006	-7 ± 19[e] , 33	9.0 ± 5.4 , 9.0	82,700 ± 3,000 , 320
1697W0125	MW-30 88' 003	-16 ± 19 , 33	10.0 ± 5.4 , 9.0	7,280 ± 440 , 320
1697W0126	MW-31 53' (002)	-12 ± 19 , 33	9.1 ± 5.4 , 9.0	1,340 ± 230 , 320
1697W0127	MW-31 67' (002)	-22 ± 19 , 33	8.5 ± 5.4 , 9.0	13,660 ± 660 , 320
1697W0128	MW-31 89' (002)	-12 ± 19 , 33	5.6 ± 5.4 , 9.0	2,270 ± 270 , 320
1697W0129	MW-32 62' (001)	11 ± 20 , 33	5.1 ± 7.5 , 12.6	7,360 ± 440 , 320
1697W0130	MW-32 92' (001)	-16 ± 19 , 33	9.2 ± 5.4 , 9.0	10,620 ± 550 , 320
1697W0131	MW-32 140' (001)	-9 ± 19 , 33	3.8 ± 5.4 , 9.0	10,480 ± 550 , 320
1697W0132	MW-32 160' (001)	-10 ± 19 , 33	9.3 ± 5.4 , 9.0	10,520 ± 550 , 320
1697W0133	MW-32 197' (001)	-2 ± 19 , 33	5.1 ± 5.4 , 9.0	11,000 ± 570 , 320

[a]The MDCs for each radionuclide are after the comma.

[b]Fe-55 analyzed using procedure AP13, Revision 4.

[c]Ni-63 analyzed using procedure AP12, Revision 5.

[d]H-3 analyzed using procedure AP2, Revision 15.

[e]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

TABLE 4

CONCENTRATIONS OF TECHNETIUM-99 (Tc-99) IN WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP5, REVISION 16; CP4, REVISION 3 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Tc-99 Concentrations[a] (pCi/L)
1697W0124	MW-30 74' 006	5 ± 16[b] , 27
1697W0125	MW-30 88' 003	15 ± 16 , 27
1697W0126	MW-31 53' (002)	7 ± 16 , 27
1697W0127	MW-31 67' (002)	10 ± 16 , 27
1697W0128	MW-31 89' (002)	7 ± 16 , 27
1697W0129	MW-32 62' (001)	12 ± 16 , 27
1697W0130	MW-32 92' (001)	9 ± 16 , 27
1697W0131	MW-32 140' (001)	12 ± 16 , 27
1697W0132	MW-32 160' (001)	17 ± 16 , 27
1697W0133	MW-32 197' (001)	11 ± 16 , 27

[a]The MDCs are after the comma.

[b]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

TABLE 5

CONCENTRATIONS OF TOTAL RADIOSTRONTIUM IN WATER SAMPLES BY LOW BACKGROUND BETA COUNTING AP4, REVISION 13; CP3, REVISION 2 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations, TPUs, and MDCs[a] (pCi/L)
1697W0124	MW-30 74' 006	0.2 ± 1.0[b] , 1.8
1697W0125	MW-30 88' 003	0.6 ± 1.1 , 1.8
1697W0126	MW-31 53' (002)	-0.6 ± 1.0 , 1.8
1697W0127	MW-31 67' (002)	-0.3 ± 1.0 , 1.8
1697W0128	MW-31 89' (002)	0.2 ± 1.1 , 1.9
1697W0129	MW-32 62' (001)	0.2 ± 1.1 , 1.9
1697W0130	MW-32 92' (001)	-0.1 ± 1.1 , 1.9
1697W0131	MW-32 140' (001)	0.2 ± 1.0 , 1.8
1697W0132	MW-32 160' (001)	0.4 ± 1.1 , 1.9
1697W0133	MW-32 197' (001)	0.6 ± 1.1 , 1.9

[a]The MDCs are after the comma.

[b]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

TABLE 6

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN SUSPENDED AND DISSOLVED FRACTIONS OF WATER SAMPLES AP11, REVISION 3; CP2, REVISION 12 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations[a] (pCi/g of sediment in 100 mL or pCi/L for water)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0124[b]	MW-30 74' 006	0.14 ± 0.20[c] , 0.33	-0.06 ± 0.08 , 0.21	-0.14 ± 0.15 , 0.34	0.06 ± 0.06 , 0.06
1697M0073[d]	MW-30 74' 006	0.01 ± 0.02 , 0.03	0.02 ± 0.02 , 0.03	0.00[e] ± 0.02 , 0.03	-0.01 ± 0.02 , 0.03
1697W0125	MW-30 88' 003	0.11 ± 0.23 , 0.40	0.07 ± 0.12 , 0.22	0.07 ± 0.21 , 0.37	0.02 ± 0.18 , 0.34
1697M0074	MW-30 88' 003	0.01 ± 0.03 , 0.05	0.01 ± 0.01 , 0.02	0.01 ± 0.02 , 0.04	-0.02 ± 0.02 , 0.04
1697W0126	MW-31 53' (002)	0.02 ± 0.08 , 0.18	0.02 ± 0.04 , 0.06	0.00 ± 0.09 , 0.21	-0.12 ± 0.18 , 0.39
1697M0075	MW-31 53' (002)	-0.01 ± 0.01 , 0.03	0.01 ± 0.01 , 0.01	0.000 ± 0.004[f] , 0.006	0.00 ± 0.02 , 0.04
1697W0127	MW-31 67' (002)	0.02 ± 0.19 , 0.36	-0.02 ± 0.10 , 0.22	-0.11 ± 0.19 , 0.39	-0.21 ± 0.19 , 0.46
1697M0076	MW-31 67' (002)	0.01 ± 0.02 , 0.04	0.00 ± 0.01 , 0.02	-0.01 ± 0.02 , 0.03	0.00 ± 0.01 , 0.02
1697W0128	MW-31 89' (002)	0.00 ± 0.20 , 0.38	0.06 ± 0.08 , 0.14	-0.15 ± 0.19 , 0.40	-0.02 ± 0.04 , 0.16
1697M0077	MW-31 89' (002)	0.00 ± 0.02 , 0.04	0.00 ± 0.01 , 0.02	0.00 ± 0.02 , 0.04	0.00 ± 0.02 , 0.03
1697W0129	MW-32 62' (001)	0.24 ± 0.21 , 0.33	0.02 ± 0.07 , 0.15	-0.02 ± 0.20 , 0.40	-0.04 ± 0.15 , 0.33
1697M0078	MW-32 62' (001)	0.03 ± 0.04 , 0.06	0.01 ± 0.02 , 0.03	0.01 ± 0.03 , 0.06	0.00 ± 0.01 , 0.02
1697W0130	MW-32 92' (001)	0.02 ± 0.19 , 0.37	0.04 ± 0.09 , 0.17	-0.20 ± 0.23 , 0.47	0.07 ± 0.08 , 0.07
1697M0079	MW-32 92' (001)	-0.01 ± 0.02 , 0.04	0.00 ± 0.01 , 0.02	-0.01 ± 0.02 , 0.04	-0.02 ± 0.02 , 0.05
1697W0131	MW-32 140' (001)	0.03 ± 0.20 , 0.37	-0.06 ± 0.10 , 0.21	0.03 ± 0.15 , 0.29	-0.07 ± 0.16 , 0.38
1697M0080	MW-32 140' (001)	0.01 ± 0.02 , 0.03	0.02 ± 0.01 , 0.02	0.01 ± 0.01 , 0.02	-0.01 ± 0.01 , 0.03
1697W0132	MW-32 160' (001)	0.08 ± 0.20 , 0.36	-0.07 ± 0.10 , 0.24	0.00 ± 0.15 , 0.29	0.00 ± 0.10 , 0.23
1697M0081	MW-32 160' (001)	0.02 ± 0.02 , 0.04	0.03 ± 0.02 , 0.02	-0.02 ± 0.02 , 0.04	0.01 ± 0.02 , 0.03
1697W0133	MW-32 197' (001)	0.05 ± 0.13 , 0.23	0.02 ± 0.08 , 0.17	0.05 ± 0.13 , 0.25	-0.14 ± 0.18 , 0.39
1697M0082	MW-32 197' (001)	0.00 ± 0.01 , 0.02	0.000 ± 0.003 , 0.018	0.00 ± 0.02 , 0.03	0.00 ± 0.01 , 0.01

TABLE 6 (Continued)

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN SUSPENDED AND DISSOLVED FRACTIONS OF WATER SAMPLES

AP11, REVISION 3; CP2, REVISION 12
INDIAN POINT POWER STATION
BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations[a] (pCi/g of sediment in 100 mL or pCi/L for water)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0124[b]	MW-30 74' 006	0.06 ± 0.15 , 0.28	0.06 ± 0.06 , 0.06	3.49 ± 0.53 , 0.12	3.16 ± 0.50 , 0.15
1697M0073[d]	MW-30 74' 006	-0.02 ± 0.02 , 0.04	0.00 ± 0.01 , 0.03	0.01 ± 0.01 , 0.02	0.00 ± 0.01 , 0.02
1697W0125	MW-30 88' 003	-0.04 ± 0.21 , 0.41	0.04 ± 0.14 , 0.27	3.62 ± 0.58 , 0.20	3.30 ± 0.54 , 0.05
1697M0074	MW-30 88' 003	0.00 ± 0.01 , 0.03	0.01 ± 0.01 , 0.02	0.02 ± 0.01 , 0.01	0.00 ± 0.01 , 0.02
1697W0126	MW-31 53' (002)	0.14 ± 0.15 , 0.24	0.04 ± 0.08 , 0.15	1.04 ± 0.31 , 0.24	0.91 ± 0.26 , 0.05
1697M0075	MW-31 53' (002)	0.02 ± 0.02 , 0.04	0.01 ± 0.01 , 0.02	0.01 ± 0.01 , 0.01	0.00 ± 0.01 , 0.02
1697W0127	MW-31 67' (002)	0.00 ± 0.04 , 0.41	0.02 ± 0.08 , 0.18	1.69 ± 0.37 , 0.05	1.77 ± 0.38 , 0.14
1697M0076	MW-31 67' (002)	0.01 ± 0.02 , 0.03	0.01 ± 0.01 , 0.01	0.02 ± 0.01 , 0.02	0.00 ± 0.01 , 0.01
1697W0128	MW-31 89' (002)	0.13 ± 0.16 , 0.26	0.08 ± 0.09 , 0.06	1.24 ± 0.31 , 0.19	1.17 ± 0.30 , 0.16
1697M0077	MW-31 89' (002)	0.02 ± 0.02 , 0.03	0.00 ± 0.01 , 0.02	0.01 ± 0.01 , 0.02	0.00 ± 0.01 , 0.01
1697W0129	MW-32 62' (001)	-0.04 ± 0.15 , 0.33	0.06 ± 0.10 , 0.16	0.53 ± 0.21 , 0.19	0.57 ± 0.20 , 0.05
1697M0078	MW-32 62' (001)	0.01 ± 0.02 , 0.04	0.00 ± 0.01 , 0.01	0.00 ± 0.01 , 0.02	0.01 ± 0.01 , 0.02
1697W0130	MW-32 92' (001)	0.07 ± 0.17 , 0.32	0.07 ± 0.08 , 0.07	0.53 ± 0.20 , 0.13	0.65 ± 0.22 , 0.13
1697M0079	MW-32 92' (001)	0.00 ± 0.02 , 0.04	0.00 ± 0.01 , 0.02	0.01 ± 0.01 , 0.01	0.01 ± 0.01 , 0.02
1697W0131	MW-32 140' (001)	0.07 ± 0.18 , 0.33	0.07 ± 0.09 , 0.07	0.80 ± 0.26 , 0.17	0.61 ± 0.21 , 0.05
1697M0080	MW-32 140' (001)	0.00 ± 0.01 , 0.03	0.00 ± 0.01 , 0.02	0.01 ± 0.01 , 0.01	0.01 ± 0.01 , 0.02
1697W0132	MW-32 160' (001)	0.02 ± 0.17 , 0.33	0.06 ± 0.07 , 0.06	0.58 ± 0.21 , 0.05	0.60 ± 0.22 , 0.13
1697M0081	MW-32 160' (001)	0.01 ± 0.02 , 0.03	0.01 ± 0.01 , 0.02	0.01 ± 0.01 , 0.02	0.01 ± 0.01 , 0.01
1697W0133	MW-32 197' (001)	0.14 ± 0.14 , 0.21	0.02 ± 0.09 , 0.19	0.75 ± 0.26 , 0.23	0.75 ± 0.25 , 0.23
1697M0082	MW-32 197' (001)	0.01 ± 0.01 , 0.02	0.000 ± 0.004 , 0.012	0.00 ± 0.01 , 0.02	0.01 ± 0.01 , 0.01

[a]The MDCs are after the comma.

[b]The W in the ORISE sample identification represents a water matrix.

[c]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

[d]The M in the ORISE sample identification represents a 100mL filtered fraction of the preceding water sample.

[e]Zero values are due to rounding.

[f]Significant figures expanded to avoid reporting a TPU of zero at the request of the inspector.

TABLE 7

CONCENTRATIONS OF PLUTONIUM-241 IN SUSPENDED AND DISSOLVED FRACTIONS OF WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP10, REVISION 2; CP4, REVISION 3 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations[a] (pCi/g of sediment in 100 mL or pCi/L for water)				
1697W0124[b]	MW-30 74' 006	-9	±	26[c]	,	45
1697M0073[d]	MW-30 74' 006	1.5	±	3.4	,	5.8
1697W0125	MW-30 88' 003	13	±	31	,	53
1697M0074	MW-30 88' 003	1.5	±	3.8	,	6.4
1697W0126	MW-31 53' (002)	-16	±	32	,	55
1697M0075	MW-31 53' (002)	2.0	±	3.5	,	5.9
1697W0127	MW-31 67' (002)	-6	±	31	,	53
1697M0076	MW-31 67' (002)	3.9	±	3.3	,	5.4
1697W0128	MW-31 89' (002)	-10	±	30	,	52
1697M0077	MW-31 89' (002)	1.7	±	3.7	,	6.2
1697W0129	MW-32 62' (001)	-5	±	31	,	54
1697M0078	MW-32 62' (001)	2.1	±	3.4	,	5.6
1697W0130	MW-32 92' (001)	5	±	30	,	51
1697M0079	MW-32 92' (001)	-0.2	±	3.6	,	6.1
1697W0131	MW-32 140' (001)	1	±	33	,	56
1697M0080	MW-32 140' (001)	3.9	±	3.5	,	5.6
1697W0132	MW-32 160' (001)	17	±	31	,	53
1697M0081	MW-32 160' (001)	-0.1	±	3.4	,	5.9
1697W0133	MW-32 197' (001)	-9	±	30	,	52
1697M0082	MW-32 197' (001)	2.0	±	3.1	,	5.2

[a]The MDCs are after the comma.

[b]The W in the ORISE sample identification represents a water matrix.

[c]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

[d]The M in the ORISE sample identification represents a 100 mL filtered fraction of the preceding water sample.

TABLE 8

CONCENTRATIONS OF CARBON-14 IN WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP9, REVISION 3; CP4, REVISION 3 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations, TPUs, and MDCs[a] (pCi/L)
1697W0124	MW-30 74' 006	13.0 ± 9.5[b] , 15.5
1697W0125	MW-30 88' 003	2.7 ± 9.1 , 15.5
1697W0126	MW-31 53' (002)	6.0 ± 9.2 , 15.5
1697W0127	MW-31 67' (002)	3.9 ± 9.2 , 15.5
1697W0128	MW-31 89' (002)	4.1 ± 9.2 , 15.5
1697W0129	MW-32 62' (001)	9.5 ± 9.3 , 15.5
1697W0130	MW-32 92' (001)	9.7 ± 9.4 , 15.5
1697W0131	MW-32 140' (001)	9.5 ± 9.3 , 15.5
1697W0132	MW-32 160' (001)	-2.3 ± 9.0 , 15.5
1697W0133	MW-32 197' (001)	2.9 ± 9.1 , 15.5

[a]MDCs are after the comma.

[b]Uncertainties represent the 95% confidence level, based on total propagated uncertainties.