ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

June 23, 2006

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

SUBJECT: REPORT FOR REQUESTED ANALYSES OF THREE WATER SAMPLES, SET FOUR, COLLECTED MAY 3 AND 4, 2006 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 two water samples on May 8, 2006 and one water sample on May 9, 2006 from the Indian Point Power Station in Buchanan, New York. The sample identifications and collection data are presented in Table 1. The gamma spectroscopy, total radiostrontium, hard to detect beta emitters (carbon-14, iron-55, nickel-59/63, tritium), technetium-99, alpha spectroscopy, and plutonium-241 data are provided in Tables 2 through Table 7, respectively. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

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:ar

Enclosures

cc: B. Watson, NMSS/DWMEP/DD/SP 7E18
E. Knox-Davin, NRC/NMSS/TWFN 8A23
M. Miller, NRC Region I
File 1697
E. Abelquist, ORISE
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Distribution approval and concurrence :	Initials
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P. O. Box 117
Oak Ridge, TN 37831

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
1697W0030	bottom layer	5/3/2006	15:50
1697W0031	bulk layer	5/3/2006	16:00
1697W0032	unit 2 manhole #5	5/4/2006	14:28

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
1697W0030	bottom layer	2.5 ± 2.2[b]	2.5 ± 3.7	2.5 ± 2.3	2,895 ± 91
1697W0031	bulk layer	-2.4 ± 2.1	-0.1 ± 2.3	1.5 ± 2.8	2,870 ± 90
1697W0032	unit 2 manhole #5	-0.5 ± 1.5	-0.2 ± 1.6	1.1 ± 2.2	0.1 ± 2.7

[a]The range of MDCs for the selected radionuclides is 2.6 pCi/L to 4.9 pCi/L.

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

TABLE 3

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)			
1697W0030	bottom layer	352	±	11[b]	(1)
1697W0031	bulk layer	349	±	11	(1)
1697W0032	unit 2 manhole #5	0.18	±	0.55	(0.96)

[a]MDCs are in parentheses.

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

TABLE 4

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)				
		C-14[b]	Fe-55[c]	Ni-59[d]	Ni-63[d]	H-3[e]
1697W0030	bottom layer	-6 ± 16[f] (28)	-56 ± 28 (49)	-9.2 ± 2.6 (4.7)	24.2 ± 3.5 (4.8)	1,880 ± 310 (380)
1697W0031	bulk layer	1 ± 16 (28)	-43 ± 28 (49)	-7.2 ± 2.6 (4.7)	24.4 ± 3.5 (4.8)	1,800 ± 310 (380)
1697W0032	unit 2 manhole #5	-15 ± 16 (28)	-60 ± 28 (49)	-0.6 ± 2.7 (4.7)	-1.4 ± 2.8 (4.8)	2,210 ± 330 (380)

[a]The MDCs for each radionuclide are in parentheses.

[b]C-14 analyzed using procedure AP9, Revision 3.

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

[d]Ni-59/63 analyzed using procedure AP17, Revision 0.

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

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

TABLE 5

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)			
1697W0030	bottom layer	1.9	±	8.9[b]	(15.3)
1697W0031	bulk layer	240	±	21	(15)
1697W0032	unit 2 manhole #5	10.7	±	9.2	(15.3)

[a]The MDCs are in parentheses.

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

TABLE 6

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0030	bottom layer	-0.01 ± 0.12[b] (0.25)	0.03 ± 0.06 (0.11)	-0.01 ± 0.11 (0.22)	0.03 ± 0.05 (0.08)
1697W0031	bulk layer	0.01 ± 0.11 (0.22)	0.01 ± 0.06 (0.12)	0.00[c] ± 0.09 (0.18)	-0.06 ± 0.06 (0.15)
1697W0032	unit 2 manhole #5	0.04 ± 0.20 (0.38)	-0.14 ± 0.13 (0.34)	0.02 ± 0.15 (0.30)	-0.05 ± 0.04 (0.12)

TABLE 6 (Continued)

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0030	bottom layer	0.09 ± 0.09 (0.15)	0.01 ± 0.03 (0.06)	0.43 ± 0.12 (0.08)	0.51 ± 0.13 (0.07)
1697W0031	bulk layer	0.07 ± 0.10 (0.16)	0.00 ± 0.05 (0.11)	0.41 ± 0.13 (0.13)	0.41 ± 0.12 (0.08)
1697W0032	unit 2 manhole #5	0.11 ± 0.09 (0.15)	0.05 ± 0.05 (0.08)	0.32 ± 0.11 (0.11)	0.33 ± 0.11 (0.09)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 7

CONCENTRATIONS OF PLUTONIUM-241 (Pu-241) IN 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	Pu-241 Concentrations[a] (pCi/L)			
1697W0030	bottom layer	-2	±	13[b]	(23)
1697W0031	bulk layer	2	±	15	(26)
1697W0032	unit 2 manhole #5	3	±	13	(23)

[a]The MDCs are in parentheses.

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

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

June 21, 2006

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

SUBJECT: SECOND INTERIM REPORT FOR COMPLETED ANALYSES OF ONE SOIL SAMPLE AND THIRTEEN WATER SAMPLES COLLECTED APRIL 11, 2006 THROUGH APRIL 18, 2006 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 one soil sample and 13 water samples on April 25, 2006 from the Indian Point Power Station in Buchanan, New York. This is the second interim letter report containing additional data for the requested analyses for the one soil sample and thirteen water samples that have been completed. The sample identifications and collection data are presented in Table 1. The technetium-99 data, the alpha spectroscopy data, the plutonium-241 data, and the carbon-14 data are in Table 2 through Table 5, respectively. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

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:ar

Enclosures

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J. White, NRC Region I

Distribution approval and concurrence :	Initials
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Quality Manager	MAB for Ann Payne

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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
1697S0001	MH-1 Shore discharge	4/18/2006	13:30
1697W0017	MW-40 4" 200'	4/11/2006	18:15
1697W0018	MW-51 4" 200'	4/11/2006	17:00
1697W0019	MW-48 1" 37.5'	4/12/2006	10:00
1697W0020	MW-48 2" 52'	4/12/2006	9:58
1697W0021	MW-43 2" 28'	4/12/2006	12:45
1697W0022	MW-43 2" 62'	4/12/2006	11:55
1697W0023	MW-41 1" 63'	4/12/2006	14:45
1697W0024	MW-41 2" 41'	4/12/2006	15:00
1697W0025	MW-46 4" 30'	4/12/2006	17:15
1697W0026	MW-47 1" 80'	4/13/2006	11:45
1697W0027	MW-47 2" 56'	4/13/2006	12:05
1697W0028	Unit 2 MH#5	4/17/2006	13:00
1697W0029	Hudson discharge MH-1	4/18/2006	13:30

TABLE 2

CONCENTRATIONS OF TECHNETIUM-99 (Tc-99) IN ONE SOIL SAMPLE AND 13 WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS CP4, REVISION 3 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Tc-99 Concentrations[a] (pCi/g or pCi/L)
1697S0001	MH-1 Shore discharge	0.25 ± 0.18[b] (0.30)
1697W0017	MW-40 4" 200'	2 ± 19 (32)
1697W0018	MW-51 4" 200'	4 ± 19 (32)
1697W0019	MW-48 1" 37.5'	10 ± 19 (32)
1697W0020	MW-48 2" 52'	-6 ± 18 (32)
1697W0021	MW-43 2" 28'	5 ± 19 (32)
1697W0022	MW-43 2" 62'	6 ± 19 (32)
1697W0023	MW-41 1" 63'	1 ± 19 (32)
1697W0024	MW-41 2" 41'	-4 ± 18 (32)
1697W0025	MW-46 4" 30'	6 ± 19 (32)
1697W0026	MW-47 1" 80'	13 ± 19 (32)
1697W0027	MW-47 2" 56'	-6 ± 18 (32)
1697W0028	Unit 2 MH#5	2 ± 19 (32)
1697W0029	Hudson discharge MH-1	-1 ± 19 (32)

[a]The MDCs are in parentheses.

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

TABLE 3

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN 13 WATER SAMPLES BY ALPHA SPECTROSCOPY 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/L)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0017	MW-40 4" 200'	0.01 ± 0.08[b] (0.16)	0.04 ± 0.04 (0.02)	-0.03 ± 0.08 (0.16)	0.01 ± 0.05 (0.10)
1697W0018	MW-51 4" 200'	0.02 ± 0.09 (0.16)	0.01 ± 0.03 (0.07)	0.05 ± 0.07 (0.12)	0.06 ± 0.05 (0.06)
1697W0019	MW-48 1" 37.5'	0.14 ± 0.11 (0.17)	0.00[c] ± 0.03 (0.08)	0.05 ± 0.08 (0.14)	0.01 ± 0.05 (0.10)
1697W0020	MW-48 2" 52'	0.07 ± 0.07 (0.11)	-0.03 ± 0.04 (0.11)	-0.02 ± 0.08 (0.16)	-0.01 ± 0.02 (0.06)
1697W0021	MW-43 2" 28'	0.07 ± 0.10 (0.17)	0.00 ± 0.04 (0.09)	-0.02 ± 0.08 (0.16)	0.00 ± 0.04 (0.08)
1697W0022	MW-43 2" 62'	-0.05 ± 0.09 (0.18)	0.00 ± 0.04 (0.09)	0.03 ± 0.08 (0.15)	-0.05 ± 0.06 (0.16)
1697W0023	MW-41 1" 63'	0.08 ± 0.18 (0.33)	0.02 ± 0.07 (0.15)	-0.02 ± 0.11 (0.23)	0.02 ± 0.05 (0.08)
1697W0024	MW-41 2" 41'	0.02 ± 0.13 (0.25)	0.00 ± 0.03 (0.09)	-0.02 ± 0.11 (0.22)	-0.03 ± 0.03 (0.10)
1697W0025	MW-46 4" 30'	0.07 ± 0.18 (0.32)	0.06 ± 0.07 (0.11)	0.04 ± 0.12 (0.23)	0.03 ± 0.05 (0.09)
1697W0026	MW-47 1" 80'	0.01 ± 0.14 (0.26)	0.01 ± 0.08 (0.17)	-0.04 ± 0.12 (0.25)	0.02 ± 0.04 (0.06)
1697W0027	MW-47 2" 56'	-0.06 ± 0.15 (0.30)	0.03 ± 0.06 (0.11)	0.03 ± 0.13 (0.24)	0.00 ± 0.02 (0.06)
1697W0028	Unit 2 MH#5	-0.07 ± 0.13 (0.28)	0.04 ± 0.05 (0.04)	-0.03 ± 0.13 (0.27)	-0.03 ± 0.05 (0.12)
1697W0029	Hudson discharge MH-1	0.05 ± 0.10 (0.18)	0.01 ± 0.05 (0.10)	-0.02 ± 0.09 (0.18)	0.01 ± 0.04 (0.08)

TABLE 3 (Continued)

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0017	MW-40 4" 200'	0.00 ± 0.08 (0.16)	0.03 ± 0.05 (0.08)	0.63 ± 0.14 (0.05)	0.58 ± 0.13 (0.07)
1697W0018	MW-51 4" 200'	0.13 ± 0.09 (0.12)	0.02 ± 0.06 (0.11)	4.69 ± 0.53 (0.10)	2.69 ± 0.36 (0.09)
1697W0019	MW-48 1" 37.5'	0.01 ± 0.08 (0.15)	0.04 ± 0.06 (0.10)	6.62 ± 0.66 (0.11)	2.44 ± 0.32 (0.12)
1697W0020	MW-48 2" 52'	0.09 ± 0.08 (0.12)	0.04 ± 0.04 (0.02)	0.31 ± 0.09 (0.05)	0.21 ± 0.08 (0.05)
1697W0021	MW-43 2" 28'	0.16 ± 0.08 (0.10)	-0.01 ± 0.05 (0.11)	0.85 ± 0.17 (0.07)	0.82 ± 0.17 (0.06)
1697W0022	MW-43 2" 62'	0.00 ± 0.08 (0.16)	0.02 ± 0.05 (0.09)	6.05 ± 0.62 (0.16)	4.44 ± 0.49 (0.09)
1697W0023	MW-41 1" 63'	0.17 ± 0.10 (0.13)	0.06 ± 0.05 (0.06)	1.63 ± 0.23 (0.07)	1.25 ± 0.20 (0.06)
1697W0024	MW-41 2" 41'	0.08 ± 0.11 (0.19)	0.02 ± 0.04 (0.09)	0.76 ± 0.16 (0.08)	0.71 ± 0.15 (0.05)
1697W0025	MW-46 4" 30'	0.07 ± 0.09 (0.15)	0.07 ± 0.06 (0.07)	0.87 ± 0.17 (0.10)	0.56 ± 0.14 (0.09)
1697W0026	MW-47 1" 80'	0.05 ± 0.11 (0.19)	0.06 ± 0.04 (0.02)	1.22 ± 0.19 (0.06)	0.99 ± 0.17 (0.05)
1697W0027	MW-47 2" 56'	0.06 ± 0.08 (0.14)	0.04 ± 0.04 (0.02)	3.76 ± 0.43 (0.07)	2.45 ± 0.32 (0.02)
1697W0028	Unit 2 MH#5	0.13 ± 0.10 (0.15)	-0.01 ± 0.06 (0.12)	0.20 ± 0.10 (0.11)	0.20 ± 0.10 (0.11)
1697W0029	Hudson discharge MH-1	0.10 ± 0.10 (0.16)	0.05 ± 0.04 (0.02)	0.04 ± 0.06 (0.09)	0.05 ± 0.04 (0.02)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 4

CONCENTRATIONS OF PLUTONIUM-241 (Pu-241) IN 13 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	Pu-241 Concentrations[a] (pCi/L)
1697W0017	MW-40 4" 200'	4 ± 14[b] (23)
1697W0018	MW-51 4" 200'	0[c] ± 15 (27)
1697W0019	MW-48 1" 37.5'	-10 ± 14 (24)
1697W0020	MW-48 2" 52'	-9 ± 13 (23)
1697W0021	MW-43 2" 28'	-5 ± 14 (25)
1697W0022	MW-43 2" 62'	-3 ± 22 (38)
1697W0023	MW-41 1" 63'	6 ± 15 (26)
1697W0024	MW-41 2" 41'	-2 ± 16 (28)
1697W0025	MW-46 4" 30'	-4 ± 13 (23)
1697W0026	MW-47 1" 80'	2 ± 14 (25)
1697W0027	MW-47 2" 56'	2 ± 14 (24)
1697W0028	Unit 2 MH#5	0 ± 14 (24)
1697W0029	Hudson discharge MH-1	6 ± 14 (23)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 5

CONCENTRATIONS OF CARBON-14 (C-14)
IN 13 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	C-14 Concentrations[a] (pCi/L)
1697W0017	MW-40 4" 200'	16 ± 16[b] (27)
1697W0018	MW-51 4" 200'	17 ± 16 (27)
1697W0019	MW-48 1" 37.5'	11 ± 16 (27)
1697W0020	MW-48 2" 52'	1 ± 16 (27)
1697W0021	MW-43 2" 28'	8 ± 16 (27)
1697W0022	MW-43 2" 62'	17 ± 16 (27)
1697W0023	MW-41 1" 63'	3 ± 16 (27)
1697W0024	MW-41 2" 41'	8 ± 16 (27)
1697W0025	MW-46 4" 30'	0[c] ± 16 (28)
1697W0026	MW-47 1" 80'	0 ± 16 (28)
1697W0027	MW-47 2" 56'	-5 ± 16 (28)
1697W0028	Unit 2 MH#5	-9 ± 16 (28)
1697W0029	Hudson discharge MH-1	2 ± 16 (28)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

June 16, 2006

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

SUBJECT: FINAL REPORT FOR REQUESTED ANALYSES OF SIX WATER SAMPLES, SET TWO, COLLECTED APRIL 7, 2006 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 six water samples on April 12, 2006 from the Indian Point Power Station in Buchanan, New York. This is the final letter report summarizing previously issued interim reports for the requested analyses for the six water samples. The sample identifications and collection data are presented in Table 1. The gamma spectroscopy, strontium, iron-55, nickel-59/63, tritium, technetium-99, alpha spectroscopy, plutonium-241, and carbon-14 data are provided in Table 2 through Table 8, respectively. The pertinent procedure references are provided in the specific tables.

In the second interim report, the Cm-242 data for ORISE sample 1697W0013 was incorrectly reported. A second issue arose when the uranium data reported by the licensee and our lab did not agree. A review of all the alpha spectroscopy data was initiated. All the alpha isotopic data was overestimated by a factor of five due to a transcription error in the sample quantity used for each calculation. We have initiated non-conformances to address both issues.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

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:ar

Enclosures

c: B. Watson, NMSS/DWMEP/DD/SP 7E18
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Technical Management Team Member	
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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
1697W0011	MW-42 LV41' (2")	4/7/2006	16:30
1697W0012	MW-42 LV43' (2")	4/7/2006	15:35
1697W0013	MW-42 LV45.5' (2")	4/7/2006	14:37
1697W0014	MW-42 LV48' (2")	4/7/2006	12:45
1697W0015	MW-42 HV51' (2")	4/7/2006	17:50
1697W0016	MW-42 78' (1")	4/7/2006	17:20

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
1697W0011	MW-42 LV41' (2")	-3 ± 13[b]	70 ± 30	6 ± 16	49,200 ± 1,600
1697W0012	MW-42 LV43' (2")	1.7 ± 9.8	57 ± 17	0[c] ± 11	51,400 ± 1,600
1697W0013	MW-42 LV45.5' (2")	3.0 ± 9.1	63 ± 25	-9 ± 18	51,400 ± 1,700
1697W0014	MW-42 LV48' (2")	11 ± 18	39 ± 26	4 ± 18	52,500 ± 1,700
1697W0015	MW-42 HV51' (2")	7 ± 17	63 ± 24	5 ± 15	35,900 ± 1,200
1697W0016	MW-42 78' (1")	1.5 ± 9.6	1 ± 10	2 ± 10	61 ± 17

[a]The range of MDCs for the selected radionuclides is 10 pCi/L to 82 pCi/L.

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

[c]Zero value is due to rounding.

TABLE 3

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)
1697W0011	MW-42 LV41' (2")	175.9 ± 6.3[b] (1.3)
1697W0012	MW-42 LV43' (2")	161.6 ± 5.8 (1.2)
1697W0013	MW-42 LV45.5' (2")	149.0 ± 5.4 (1.2)
1697W0014	MW-42 LV48' (2")	146.7 ± 5.3 (1.2)
1697W0015	MW-42 HV51' (2")	184.4 ± 6.4 (1.2)
1697W0016	MW-42 78' (1")	0.63 ± 0.75 (1.26)

[a]MDCs are in parentheses.

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

TABLE 4

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-59[c]	Ni-63[c]	H-3[d]
1697W0011	MW-42 LV41' (2")	18 ± 34[e] (57)	-321 ± 13 (21)	5,730 ± 350 (20)	1,860 ± 310 (390)
1697W0012	MW-42 LV43' (2")	118 ± 37 (57)	1 ± 13 (22)	5,910 ± 370 (20)	2,050 ± 320 (390)
1697W0013	MW-42 LV45.5' (2")	-4 ± 33 (57)	-88 ± 10 (22)	5,980 ± 370 (20)	2,030 ± 320 (390)
1697W0014	MW-42 LV48' (2")	-9 ± 33 (57)	-423 ± 16 (23)	6,740 ± 420 (20)	1,880 ± 320 (390)
1697W0015	MW-42 HV51' (2")	0[f] ± 33 (57)	-220 ± 10 (20)	5,260 ± 320 (20)	2,160 ± 330 (390)
1697W0016	MW-42 78' (1")	-6 ± 33 (57)	10.0 ± 6.3 (10.3)	18.9 ± 6.5 (10.4)	340 ± 240 (390)

[a]The MDCs for each radionuclide are in parentheses.

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

[c]Ni-59/63 analyzed using procedure AP17, Revision 0.

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

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

[f]Zero value is due to rounding.

TABLE 5

CONCENTRATIONS OF TECHNETIUM-99 (Tc-99) 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	Tc-99 Concentrations[a] (pCi/L)
1697W0011	MW-42 LV41' (2")	8 ± 19[b] (31)
1697W0012	MW-42 LV43' (2")	5 ± 18 (31)
1697W0013	MW-42 LV45.5' (2")	3 ± 18 (31)
1697W0014	MW-42 LV48' (2")	1 ± 18 (31)
1697W0015	MW-42 HV51' (2")	11 ± 19 (31)
1697W0016	MW-42 78' (1")	13 ± 19 (31)

[a]The MDCs for each radionuclide are in parentheses.

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

TABLE 6

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN WATER SAMPLES BY ALPHA SPECTROSCOPY 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/L)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0011	MW-42 LV41' (2")	0.09 ± 0.15[b] (0.25)	0.01 ± 0.08 (0.17)	0.03 ± 0.09 (0.17)	-0.01 ± 0.05 (0.10)
1697W0012	MW-42 LV43' (2")	0.06 ± 0.17 (0.31)	0.00[c] ± 0.09 (0.19)	0.02 ± 0.13 (0.25)	-0.04 ± 0.05 (0.12)
1697W0013	MW-42 LV45.5' (2")	0.05 ± 0.13 (0.23)	0.01 ± 0.06 (0.12)	-0.11 ± 0.10 (0.22)	0.00 ± 0.04 (0.09)
1697W0014	MW-42 LV48' (2")	0.07 ± 0.14 (0.25)	0.01 ± 0.06 (0.13)	0.04 ± 0.12 (0.22)	0.03 ± 0.04 (0.06)
1697W0015	MW-42 HV51' (2")	-0.03 ± 0.15 (0.30)	-0.07 ± 0.07 (0.20)	-0.10 ± 0.14 (0.30)	0.01 ± 0.04 (0.08)
1697W0016	MW-42 78' (1")	0.06 ± 0.16 (00.30)	0.00 ± 0.09 (0.20)	-0.05 ± 0.17 (0.35)	0.01 ± 0.04 (0.09)

TABLE 6 (Continued)

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0011	MW-42 LV41' (2")	0.13 ± 0.08 (0.11)	0.04 ± 0.05 (0.09)	1.28 ± 0.20 (0.05)	1.35 ± 0.21 (0.08)
1697W0012	MW-42 LV43' (2")	0.14 ± 0.08 (0.10)	0.06 ± 0.06 (0.08)	1.49 ± 0.25 (0.07)	1.53 ± 0.25 (0.07)
1697W0013	MW-42 LV45.5' (2")	0.09 ± 0.08 (0.12)	-0.01 ± 0.05 (0.11)	1.72 ± 0.26 (0.11)	1.34 ± 0.22 (0.12)
1697W0014	MW-42 LV48' (2")	0.18 ± 0.09 (0.12)	0.05 ± 0.05 (0.07)	1.55 ± 0.23 (0.02)	1.33 ± 0.21 (0.02)
1697W0015	MW-42 HV51' (2")	0.08 ± 0.07 (0.10)	0.03 ± 0.05 (0.08)	1.52 ± 0.24 (0.02)	1.27 ± 0.22 (0.09)
1697W0016	MW-42 78' (1")	0.08 ± 0.09 (0.13)	-0.01 ± 0.05 (0.13)	1.69 ± 0.26 (0.13)	1.64 ± 0.25 (0.11)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 7

CONCENTRATIONS OF PLUTONIUM-241 (Pu-241) IN 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	Pu-241 Concentrations[a] (pCi/L)
1697W0011	MW-42 LV41' (2")	-3 ± 14[b] (24)
1697W0012	MW-42 LV43' (2")	-1 ± 14 (24)
1697W0013	MW-42 LV45.5' (2")	4 ± 14 (24)
1697W0014	MW-42 LV48' (2")	-2 ± 14 (24)
1697W0015	MW-42 HV51' (2")	-6 ± 14 (24)
1697W0016	MW-42 78' (1")	-2 ± 21 (37)

[a]The MDCs are in parentheses.

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

TABLE 8

CONCENTRATIONS OF CARBON-14 (C-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	C-14 Concentrations[a] (pCi/L)
1697W0011	MW-42 LV41' (2")	6 ± 16[b] (27)
1697W0012	MW-42 LV43' (2")	-6 ± 16 (27)
1697W0013	MW-42 LV45.5' (2")	-1 ± 16 (27)
1697W0014	MW-42 LV48' (2")	-4 ± 16 (27)
1697W0015	MW-42 HV51' (2")	1 ± 16 (27)
1697W0016	MW-42 78' (1")	-4 ± 16 (27)

[a]The MDCs are in parentheses.

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

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

June 13, 2006

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

SUBJECT: FINAL REPORT FOR REQUESTED ANALYSES OF TEN WATER SAMPLES, SET ONE, COLLECTED MARCH 22, 2006 TO MARCH 24, 2006 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 ten water samples on March 31, 2006 from the Indian Point Power Station in Buchanan, New York. This is the final letter report summarizing two previously issued interim reports for the requested analyses for the ten water samples. The sample identifications and collection data are presented in Table 1. The gamma spectroscopy, strontium, iron-55, nickel-64, tritium, technetium-99, alpha spectroscopy, and plutonium-241 data are in Table 2 through Table 7, respectively. The pertinent procedure references are provided in the specific tables.

The analytical request for carbon-14 (C-14) could not be completed. The water samples were filtered and acidified before an aliquot for the C-14 analysis was taken from each sample. Any C-14 present in the water samples would be oxidized to CO_2 which would out gas from the samples. We apologize for the error and all laboratory staff members have been reminded to take a separate aliquot for the C-14 analysis from each water sample from Indian Point before acidification.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request. At present, ORISE does not participate in a performance evaluation program that includes plutonium-241, neptunium, and curium isotopes, but the Nuclear Regulatory Commission's Intercomparison Testing Program is being expanded to include these radionuclides.

P. O. Box 117
Oak Ridge, TN 37831

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:db

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
1697W0001	MW-50 42'	3/22/2006	14:30
1697W0002	MW-50 67'	3/22/2006	14:40
1697W0003	MW-49 25'	3/22/2006	16:50
1697W0004	MW-49 42'	3/22/2006	16:45
1697W0005	MW-49 65.5'	3/22/2006	16:45
1697W0006	MW-42 49'	3/23/2006	11:15
1697W0007	MW-42 78'	3/24/2006	9:45
1697W0008	MW-36 26'	3/23/2006	16:00
1697W0009	MW-36 41'	3/24/2006	13:15
1697W0010	MW-36 52'	3/23/2006	16:00

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/mL)			
		Co-58	Co-60	Cs-134	Cs-137
1697W0001	MW-50 42'	-1.4 ± 2.5[b]	-1.0 ± 2.7	0.5 ± 2.5	1.2 ± 2.3
1697W0002	MW-50 67'	-3.6 ± 2.9	3.1 ± 2.7	1.3 ± 2.7	-1.8 ± 4.1
1697W0003	MW-49 25'	0.6 ± 2.2	-0.5 ± 2.3	-0.9 ± 2.3	3.2 ± 2.1
1697W0004	MW-49 42'	0.1 ± 1.7	1.4 ± 2.0	1.4 ± 2.3	0.1 ± 1.7
1697W0005	MW-49 65.5'	1.4 ± 2.5	-4.0 ± 2.4	-1.1 ± 2.8	0.3 ± 2.3
1697W0006	MW-42 49'	-0.9 ± 2.3	58.7 ± 5.7	0.1 ± 2.4	4770 ± 150
1697W0007	MW-42 78'	0.6 ± 2.3	1.7 ± 2.3	3.3 ± 2.3	33.1 ± 5.1
1697W0008	MW-36 26'	1.4 ± 3.2	0.2 ± 1.8	-0.7 ± 1.8	0.2 ± 1.9
1697W0009	MW-36 41'	-0.3 ± 2.4	-0.4 ± 2.4	-1.2 ± 2.5	-1.3 ± 2.2
1697W0010	MW-36 52'	-1.2 ± 2.2	3.3 ± 3.1	0.3 ± 2.3	1.0 ± 4.4

[a]The range of MDCs for the selected radionuclides is 2.8 pCi/mL to 5.4 pCi/mL.

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

TABLE 3

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)			
1697W0001	MW-50 42'	24.5	±	1.8[b]	(1.2)
1697W0002	MW-50 67'	30.6	±	1.7	(0.8)
1697W0003	MW-49 25'	16.7	±	1.3	(0.9)
1697W0004	MW-49 42'	22.5	±	1.4	(0.8)
1697W0005	MW-49 65.5'	21.5	±	1.5	(0.8)
1697W0006	MW-42 49'	60.5	±	2.7	(0.8)
1697W0007	MW-42 78'	0.37	±	0.45	(0.75)
1697W0008	MW-36 26'	1.69	±	0.60	(0.86)
1697W0009	MW-36 41'	4.04	±	0.79	(0.96)
1697W0010	MW-36 52'	5.71	±	0.78	(0.80)

[a]MDCs are in parentheses.

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

TABLE 4

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-59[c]	Ni-63[c]	H-3[d]
1697W0001	MW-50 42'	-14 ± 72[e] (124)	4.2 ± 5.2 (8.8)	5.4 ± 5.4 (9.0)	8,190 ± 550 (400)
1697W0002	MW-50 67'	-10 ± 72 (124)	-2.4 ± 5.0 (8.8)	9.9 ± 5.5 (9.0)	9,490 ± 590 (400)
1697W0003	MW-49 25'	-48 ± 72 (124)	3.4 ± 5.2 (8.8)	6.3 ± 5.4 (9.0)	14,240 ± 740 (400)
1697W0004	MW-49 42'	-30 ± 72 (124)	7.3 ± 5.3 (8.8)	5.6 ± 5.4 (9.0)	9,130 ± 580 (400)
1697W0005	MW-49 65.5'	-33 ± 72 (124)	2.0 ± 5.2 (8.8)	7.9 ± 5.5 (9.0)	6,290 ± 490 (400)
1697W0006	MW-42 49'	-19 ± 72 (124)	71.9 ± 7.8 (8.8)	1392 ± 86 (9)	2,290 ± 340 (400)
1697W0007	MW-42 78'	-36 ± 72 (124)	2.8 ± 5.2 (8.8)	53.4 ± 7.3 (9.0)	510 ± 250 (400)
1697W0008	MW-36 26'	-39 ± 72 (124)	-3.9 ± 5.0 (8.8)	67.3 ± 8.0 (9.0)	35,100 ± 1,300 (400)
1697W0009	MW-36 41'	24 ± 73 (124)	0.1 ± 5.1 (8.8)	47.4 ± 7.0 (9.0)	56,200 ± 1,800 (400)
1697W0010	MW-36 52'	-44 ± 72 (124)	-0.3 ± 5.1 (8.8)	10.3 ± 5.5 (9.0)	26,900 ± 1,100 (400)

[a]The MDCs for each radionuclide are in parentheses.

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

[c]Ni-59/63 analyzed using procedure AP17, Revision 0.

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

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

TABLE 5

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)			
1697W0001	MW-50 42'	-3	±	18[b]	(31)
1697W0002	MW-50 67'	-6	±	18	(31)
1697W0003	MW-49 25'	-1	±	18	(31)
1697W0004	MW-49 42'	1	±	18	(31)
1697W0005	MW-49 65.5'	-7	±	18	(31)
1697W0006	MW-42 49'	-6	±	18	(31)
1697W0007	MW-42 78'	-14	±	18	(31)
1697W0008	MW-36 26'	6	±	18	(31)
1697W0009	MW-36 41'	9	±	19	(31)
1697W0010	MW-36 52'	14	±	19	(31)

[a]The MDCs are in parentheses.

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

TABLE 6

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0001	MW-50 42'	0.08 ± 0.52[b] (0.95)	0.04 ± 0.13 (0.29)	-0.19 ± 0.41 (0.85)	0.31 ± 0.21 (0.10)
1697W0002	MW-50 67'	0.19 ± 0.45 (0.79)	-0.08 ± 0.16 (0.43)	0.08 ± 0.33 (0.63)	0.00[c] ± 0.19 (0.43)
1697W0003	MW-49 25'	0.38 ± 0.47 (0.77)	0.08 ± 0.21 (0.42)	-0.41 ± 0.38 (0.86)	-0.24 ± 0.32 (0.70)
1697W0004	MW-49 42'	0.31 ± 0.41 (0.69)	0.04 ± 0.18 (0.37)	0.00 ± 0.38 (0.75)	0.10 ± 0.15 (0.25)
1697W0005	MW-49 65.5'	0.19 ± 0.51 (0.90)	-0.08 ± 0.19 (0.47)	0.12 ± 0.40 (0.74)	0.16 ± 0.23 (0.39)
1697W0006	MW-42 49'	-0.04 ± 0.45 (0.87)	-0.16 ± 0.16 (0.50)	-0.04 ± 0.39 (0.77)	-0.20 ± 0.29 (0.68)
1697W0007	MW-42 78'	0.12 ± 0.32 (0.59)	-0.15 ± 0.22 (0.55)	0.12 ± 0.30 (0.55)	0.33 ± 0.29 (0.40)
1697W0008	MW-36 26'	0.32 ± 0.30 (0.44)	-0.04 ± 0.18 (0.44)	-0.08 ± 0.32 (0.67)	0.29 ± 0.30 (0.45)
1697W0009	MW-36 41'	0.14 ± 0.41 (0.74)	0.00 ± 0.15 (0.35)	-0.04 ± 0.28 (0.58)	-0.11 ± 0.27 (0.61)
1697W0010	MW-36 52'	0.82 ± 0.68 (1.02)	0.25 ± 0.31 (0.48)	0.06 ± 0.38 (0.78)	-0.34 ± 0.30 (0.73)

TABLE 6 (Continued)

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0001	MW-50 42'	0.51 ± 0.46 (0.72)	0.03 ± 0.15 (0.33)	0.80 ± 0.34 (0.30)	0.65 ± 0.35 (0.41)
1697W0002	MW-50 67'	0.46 ± 0.47 (0.76)	0.08 ± 0.24 (0.47)	0.44 ± 0.31 (0.40)	0.54 ± 0.30 (0.28)
1697W0003	MW-49 25'	0.65 ± 0.48 (0.72)	0.14 ± 0.31 (0.56)	1.03 ± 0.41 (0.39)	0.57 ± 0.35 (0.46)
1697W0004	MW-49 42'	0.40 ± 0.41 (0.65)	0.03 ± 0.11 (0.25)	2.18 ± 0.54 (0.23)	0.83 ± 0.32 (0.09)
1697W0005	MW-49 65.5'	0.20 ± 0.47 (0.83)	0.20 ± 0.18 (0.12)	1.58 ± 0.55 (0.44)	0.94 ± 0.41 (0.30)
1697W0006	MW-42 49'	0.20 ± 0.40 (0.71)	0.16 ± 0.30 (0.54)	1.31 ± 0.61 (0.76)	1.03 ± 0.48 (0.53)
1697W0007	MW-42 78'	0.33 ± 0.45 (0.76)	0.08 ± 0.26 (0.51)	1.89 ± 0.58 (0.45)	1.38 ± 0.48 (0.35)
1697W0008	MW-36 26'	0.37 ± 0.44 (0.72)	0.29 ± 0.22 (0.12)	0.76 ± 0.38 (0.40)	0.47 ± 0.28 (0.28)
1697W0009	MW-36 41'	0.11 ± 0.43 (0.79)	0.00 ± 0.18 (0.41)	0.17 ± 0.32 (0.56)	0.24 ± 0.28 (0.46)
1697W0010	MW-36 52'	0.15 ± 0.42 (0.76)	0.08 ± 0.19 (0.37)	1.66 ± 0.59 (0.66)	0.86 ± 0.37 (0.32)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 7

CONCENTRATIONS OF PLUTONIUM-241 (Pu-241) IN 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	Pu-241 Concentrations[a] (pCi/L)			
1697W0001	MW-50 42'	6	±	77[b]	(131)
1697W0002	MW-50 67'	39	±	78	(132)
1697W0003	MW-49 25'	-42	±	74	(129)
1697W0004	MW-49 42'	8	±	79	(135)
1697W0005	MW-49 65.5'	-18	±	83	(142)
1697W0006	MW-42 49'	15	±	78	(134)
1697W0007	MW-42 78'	8	±	84	(143)
1697W0008	MW-36 26'	-12	±	80	(138)
1697W0009	MW-36 41'	-29	±	78	(135)
1697W0010	MW-36 52'	0[c]	±	79	(136)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

May 26, 2006

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

SUBJECT: INTERIM REPORT FOR COMPLETED ANALYSES OF SIX WATER SAMPLES COLLECTED APRIL 7, 2006 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 six water samples on April 12, 2006 from the Indian Point Power Station in Buchanan, New York This letter report contains data for the analyses that have been completed to date The sample identifications and collection data are presented in Table 1, the technetium-99 data are presented in Table 2, the alpha spectroscopy data are presented in Table 3 and the plutonium-241 data are presented in Table 4. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

As more analytical data becomes available, additional interim letter reports will be issued as needed. A final report will be issued when all requested analyses are completed.

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

Sincerely,

Wade P. Ivey for

Dale Condra, Manager
Laboratory

RDC:WPI:ar

Enclosures

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
E. Knox-Davin, NRC/NMSS/TWFN 8A23
M. Miller, NRC Region I
File 1697

E. Abelquist, ORISE
S. Kirk, ORISE
J. White, NRC Region I

Distribution approval and concurrence :	Initials
Technical Management Team Member	
Quality Manager	

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P. O. Box 117
Oak Ridge, TN 37831

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
1697W0011	MW-42 LV41' (2")	4/7/2006	16:30
1697W0012	MW-42 LV43' (2")	4/7/2006	15:35
1697W0013	MW-42 LV45.5' (2")	4/7/2006	14:37
1697W0014	MW-42 LV48' (2")	4/7/2006	12:45
1697W0015	MW-42 HV51' (2")	4/7/2006	17:50
1697W0016	MW-42 78' (1")	4/7/2006	17:20

TABLE 2

CONCENTRATIONS OF TECHNETIUM-99 (Tc-99) 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	Tc-99 Concentrations[a] (pCi/L)
1697W0011	MW-42 LV41' (2")	8 ± 19[b] (31)
1697W0012	MW-42 LV43' (2")	5 ± 18 (31)
1697W0013	MW-42 LV45.5' (2")	3 ± 18 (31)
1697W0014	MW-42 LV48' (2")	1 ± 18 (31)
1697W0015	MW-42 HV51' (2")	11 ± 19 (31)
1697W0016	MW-42 78' (1")	13 ± 19 (31)

[a]The MDCs for each radionuclide are in parentheses.

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

TABLE 3

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN WATER SAMPLES BY ALPHA SPECTROSCOPY 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/L)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0011	MW-42 LV41' (2")	0.37 ± 0.73[b] (1.27)	0.06 ± 0.42 (0.84)	0.12 ± 0.43 (0.84)	-0.07 ± 0.23 (0.52)
1697W0012	MW-42 LV43' (2")	0.23 ± 0.86 (1.58)	0.00[c] ± 0.44 (0.95)	0.08 ± 0.64 (1.25)	-0.22 ± 0.25 (0.62)
1697W0013	MW-42 LV45.5' (2")	0.25 ± 0.63 (1.12)	0.00 ± 0.00 (0.62)	-0.56 ± 0.49 (1.12)	0.00 ± 0.21 (0.46)
1697W0014	MW-42 LV48' (2")	0.34 ± 0.72 (1.27)	0.07 ± 0.31 (0.66)	0.21 ± 0.60 (1.11)	0.15 ± 0.19 (0.29)
1697W0015	MW-42 HV51' (2")	-0.21 ± 0.74 (1.48)	-0.35 ± 0.37 (0.99)	-0.48 ± 0.71 (1.52)	0.04 ± 0.19 (0.39)
1697W0016	MW-42 78' (1")	0.32 ± 0.82 (1.48)	0.00 ± 0.46 (0.99)	-0.24 ± 0.87 (1.74)	0.06 ± 0.21 (0.45)

TABLE 3 (Continued)

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN WATER SAMPLES BY ALPHA SPECTROSCOPY 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/L)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0011	MW-42 LV41' (2")	0.64 ± 0.41 (0.55)	0.18 ± 0.26 (0.44)	6.4 ± 1.0 (0.2)	6.7 ± 1.1 (0.4)
1697W0012	MW-42 LV43' (2")	0.69 ± 0.39 (0.49)	0.29 ± 0.27 (0.40)	7.4 ± 1.2 (0.4)	7.6 ± 1.2 (0.4)
1697W0013	MW-42 LV45.5' (2")	0.45 ± 0.39 (0.60)	-0.07 ± 0.24 (0.54)	8.6 ± 1.3 (0.5)	6.7 ± 1.1 (0.6)
1697W0014	MW-42 LV48' (2")	0.88 ± 0.47 (0.58)	0.23 ± 0.24 (0.37)	7.7 ± 1.1 (0.1)	6.6 ± 1.0 (0.1)
1697W0015	MW-42 HV51' (2")	0.42 ± 0.35 (0.51)	0.14 ± 0.22 (0.39)	7.6 ± 1.2 (0.1)	6.3 ± 1.1 (0.4)
1697W0016	MW-42 78' (1")	0.41 ± 0.43 (0.65)	-0.06 ± 0.26 (0.65)	8.4 ± 1.3 (0.6)	8.2 ± 1.3 (0.5)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 4

CONCENTRATIONS OF PLUTONIUM-241 (Pu-241) IN 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	Pu-241 Concentrations[a] (pCi/L)
1697W0011	MW-42 LV41' (2")	-15 ± 69[b] (119)
1697W0012	MW-42 LV43' (2")	-5 ± 69 (119)
1697W0013	MW-42 LV45.5' (2")	22 ± 70 (120)
1697W0014	MW-42 LV48' (2")	-11 ± 69 (119)
1697W0015	MW-42 HV51' (2")	-28 ± 68 (118)
1697W0016	MW-42 78' (1")	-10 ± 110 (180)

[a]The MDCs are in parentheses.

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

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

May 16, 2006

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

SUBJECT: INTERIM REPORT FOR COMPLETED ANALYSES OF ONE SOIL SAMPLE AND THIRTEEN WATER SAMPLES COLLECTED APRIL 11, 2006 THROUGH APRIL 18, 2006 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 one soil sample and 13 water samples on April 25, 2006 from the Indian Point Power Station in Buchanan, New York. This letter report contains data for the analyses that have been completed to date. The sample identifications and collection data are presented in Table 1, the gamma spectroscopy data are presented in Table 2, the total radiostrontium data are presented in Table 3, the hard to detect beta data for the 13 water samples are presented in Table 4. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

As more analytical data becomes available, additional interim letter reports will be issued as needed. A final report will be issued when all requested analyses are completed.

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

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Enclosure

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
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J. White, NRC Region I

Distribution approval and concurrence :	Initials
Technical Management Team Member	SRK
Quality Manager	CTP

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Oak Ridge, TN 37831

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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
1697S0001	MH-1 Shore discharge	4/18/2006	13:30
1697W0017	MW-40 4" 200'	4/11/2006	18:15
1697W0018	MW-51 4" 200'	4/11/2006	17:00
1697W0019	MW-48 1" 37.5'	4/12/2006	10:00
1697W0020	MW-48 2" 52'	4/12/2006	9:58
1697W0021	MW-43 2" 28'	4/12/2006	12:45
1697W0022	MW-43 2" 62'	4/12/2006	11:55
1697W0023	MW-41 1" 63'	4/12/2006	14:45
1697W0024	MW-41 2" 41'	4/12/2006	15:00
1697W0025	MW-46 4" 30'	4/12/2006	17:15
1697W0026	MW-47 1" 80'	4/13/2006	11:45
1697W0027	MW-47 2" 56'	4/13/2006	12:05
1697W0028	Unit 2 MH#5	4/17/2006	13:00
1697W0029	Hudson discharge MH-1	4/18/2006	13:30

TABLE 2

CONCENTRATIONS OF SELECTED GAMMA EMITTING RADIONUCLIDES IN ONE SOIL SAMPLE AND 13 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/g or pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1697S0001[b]	MH-1 Shore discharge	0.00[c] ± 0.03[d]	0.00 ± 0.04	0.00 ± 0.04	0.06 ± 0.04
1697W0017[e]	MW-40 4" 200'	-0.1 ± 2.6	2.3 ± 2.1	1.0 ± 2.1	2.0 ± 4.4
1697W0018	MW-51 4" 200'	0.8 ± 2.5	-0.4 ± 2.1	2.1 ± 2.2	0.9 ± 2.4
1697W0019	MW-48 1" 37.5'	-3.3 ± 1.7	0.0 ± 2.0	-2.3 ± 2.5	0.5 ± 1.9
1697W0020	MW-48 2" 52'	0.4 ± 2.8	0.5 ± 2.3	1.8 ± 2.7	0.9 ± 2.1
1697W0021	MW-43 2" 28'	1.3 ± 2.5	-0.6 ± 2.6	-0.5 ± 2.4	0.3 ± 2.2
1697W0022	MW-43 2" 62'	1.9 ± 2.9	0.6 ± 1.7	-3.0 ± 2.5	0.0 ± 1.6
1697W0023	MW-41 1" 63'	-0.2 ± 2.6	0.3 ± 2.3	0.0 ± 2.3	2.1 ± 2.1
1697W0024	MW-41 2" 41'	0.0 ± 2.7	0.1 ± 2.6	-1.6 ± 2.6	0.6 ± 2.0
1697W0025	MW-46 4" 30'	-1.5 ± 2.2	3.1 ± 3.2	0.5 ± 2.2	-0.2 ± 4.1
1697W0026	MW-47 1" 80'	-1.2 ± 2.6	1.4 ± 2.5	1.9 ± 2.5	0.6 ± 2.2
1697W0027	MW-47 2" 56'	-2.8 ± 2.7	1.9 ± 2.3	0.6 ± 2.9	-0.1 ± 2.5
1697W0028	Unit 2 MH#5	0.0 ± 2.3	1.7 ± 2.3	1.3 ± 2.3	1.0 ± 2.8
1697W0029	Hudson discharge MH-1	-0.5 ± 2.1	1.1 ± 2.2	0.7 ± 2.2	-3.6 ± 4.0

[a]The range of MDCs for the selected radionuclides for the soil sample is 0.05 pCi/g to 0.07 pCi/g and for the water samples is 2.7 pCi/L to 4.4 pCi/L.

[b]Soil concentrations, TPUs, and MDCs are in pCi/g.

[c]Zero values are due to rounding.

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

[e]Water concentrations, TPUs, and MDCs are in pCi/L.

TABLE 3

CONCENTRATIONS OF TOTAL RADIOSTRONTIUM IN ONE SOIL SAMPLE AND 13 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/g or pCi/L)			
1697S0001[b]	MH-1 Shore discharge	0.01	±	0.13[c]	(0.23)
1697W0017[d]	MW-40 4" 200'	0.34	±	0.49	(0.83)
1697W0018	MW-51 4" 200'	0.14	±	0.46	(0.80)
1697W0019	MW-48 1" 37.5'	0.49	±	0.48	(0.80)
1697W0020	MW-48 2" 52'	0.46	±	0.46	(0.77)
1697W0021	MW-43 2" 28'	-0.09	±	0.46	(0.83)
1697W0022	MW-43 2" 62'	1.30	±	0.55	(0.83)
1697W0023	MW-41 1" 63'	5.01	±	0.81	(0.91)
1697W0024	MW-41 2" 41'	3.72	±	0.65	(0.76)
1697W0025	MW-46 4" 30'	1.23	±	0.50	(0.75)
1697W0026	MW-47 1" 80'	4.08	±	0.74	(0.88)
1697W0027	MW-47 2" 56'	1.19	±	0.54	(0.83)
1697W0028	Unit 2 MH#5	0.12	±	0.46	(0.82)
1697W0029	Hudson discharge MH-1	0.58	±	0.55	(0.92)

[a]MDCs are in parentheses.

[b]Soil concentrations, TPUs, and MDCs are in pCi/g.

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

[d]Water concentrations, TPUs, and MDCs are in pCi/L.

TABLE 4

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-59[c]	Ni-63[c]	H-3[d]
1697W0017	MW-40 4" 200'	6 ± 35[e] (60)	4.8 ± 5.9 (9.8)	4.2 ± 5.9 (10.0)	100 ± 230 (390)
1697W0018	MW-51 4" 200'	-4 ± 35 (60)	-0.9 ± 5.7 (9.8)	6.1 ± 6.0 (10.0)	160 ± 230 (390)
1697W0019	MW-48 1" 37.5'	11 ± 35 (60)	8.8 ± 5.9 (9.8)	1.7 ± 5.9 (10.0)	90 ± 230 (390)
1697W0020	MW-48 2" 52'	9 ± 35 (60)	3.9 ± 5.8 (9.8)	3.6 ± 5.9 (10.0)	220 ± 230 (390)
1697W0021	MW-43 2" 28'	-12 ± 35 (60)	6.1 ± 5.9 (9.8)	3.5 ± 5.9 (10.0)	230 ± 230 (390)
1697W0022	MW-43 2" 62'	14 ± 35 (60)	8.1 ± 5.9 (9.8)	1.1 ± 5.9 (10.0)	40 ± 220 (390)
1697W0023	MW-41 1" 63'	21 ± 36 (60)	5.1 ± 5.9 (9.8)	2.9 ± 5.9 (10.0)	440 ± 250 (390)
1697W0024	MW-41 2" 41'	-3 ± 35 (60)	10.6 ± 6.0 (9.8)	0.4 ± 5.8 (10.0)	490 ± 250 (390)
1697W0025	MW-46 4" 30'	-5 ± 35 (60)	6.0 ± 5.9 (9.8)	3.1 ± 5.9 (10.0)	1,510 ± 300 (390)
1697W0026	MW-47 1" 80'	-1 ± 35 (60)	2.0 ± 5.8 (9.8)	3.6 ± 5.9 (10.0)	1,980 ± 320 (390)
1697W0027	MW-47 2" 56'	25 ± 36 (60)	8.9 ± 5.9 (9.8)	-0.2 ± 5.8 (10.0)	280 ± 240 (390)
1697W0028	Unit 2 MH#5	16 ± 35 (60)	21.5 ± 6.3 (9.8)	-1.2 ± 5.8 (10.0)	120 ± 230 (390)
1697W0029	Hudson discharge MH-1	-5 ± 35 (60)	1.5 ± 5.8 (9.8)	1.5 ± 5.9 (10.0)	-210 ± 210 (390)

[a]The MDCs for each radionuclide are in parentheses.

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

[c]Ni-59/63 analyzed using procedure AP17, Revision 0.

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

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

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

May 12, 2006

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

SUBJECT: INTERIM REPORT FOR COMPLETED ANALYSES OF SIX WATER SAMPLES COLLECTED APRIL 7, 2006 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 six waters samples on April 12, 2006 from the Indian Point Power Station in Buchanan, New York. This letter report contains data for the analyses that have been completed to date. The sample identifications and collection data are presented in Table 1, the gamma spectroscopy data are presented in Table 2, the total radiostrontium data are presented in Table 3, the hard to detect beta data are presented in Table 4. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

As more analytical data becomes available, additional interim letter reports will be issued as needed. A final report will be issued when all requested analyses are completed.

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

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Dale Condra

Dale Condra, Manager
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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
1697W0011	MW-42 LV41' (2")	4/7/2006	16:30
1697W0012	MW-42 LV43' (2")	4/7/2006	15:35
1697W0013	MW-42 LV45.5' (2")	4/7/2006	14:37
1697W0014	MW-42 LV48' (2")	4/7/2006	12:45
1697W0015	MW-42 HV51' (2")	4/7/2006	17:50
1697W0016	MW-42 78' (1")	4/7/2006	17:20

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
1697W0011	MW-42 LV41' (2")	-3 ± 13[b]	70 ± 30	6 ± 16	49,200 ± 1,600
1697W0012	MW-42 LV43' (2")	1.7 ± 9.8	57 ± 17	0[c] ± 11	51,400 ± 1,600
1697W0013	MW-42 LV45.5' (2")	3.0 ± 9.1	63 ± 25	-9 ± 18	51,400 ± 1,700
1697W0014	MW-42 LV48' (2")	11 ± 18	39 ± 26	4 ± 18	52,500 ± 1,700
1697W0015	MW-42 HV51' (2")	7 ± 17	63 ± 24	5 ± 15	35,900 ± 1,200
1697W0016	MW-42 78' (1")	1.5 ± 9.6	1 ± 10	2 ± 10	61 ± 17

[a]The range of MDCs for the selected radionuclides is 10 pCi/L to 82 pCi/L.

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

[c]Zero value is due to rounding.

TABLE 3

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)
1697W0011	MW-42 LV41' (2")	175.9 ± 6.3[b] (1.3)
1697W0012	MW-42 LV43' (2")	161.6 ± 5.8 (1.2)
1697W0013	MW-42 LV45.5' (2")	149.0 ± 5.4 (1.2)
1697W0014	MW-42 LV48' (2")	146.7 ± 5.3 (1.2)
1697W0015	MW-42 HV51' (2")	184.4 ± 6.4 (1.2)
1697W0016	MW-42 78' (1")	0.63 ± 0.75 (1.26)

[a]MDCs are in parentheses.

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

TABLE 4

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-59[c]	Ni-63[c]	H-3[d]
1697W0011	MW-42 LV41' (2")	18 ± 34[e] (57)	-321 ± 13 (21)	5,730 ± 350 (20)	1,860 ± 310 (390)
1697W0012	MW-42 LV43' (2")	118 ± 37 (57)	1 ± 13 (22)	5,910 ± 370 (20)	2,050 ± 320 (390)
1697W0013	MW-42 LV45.5' (2")	-4 ± 33 (57)	-88 ± 10 (22)	5,980 ± 370 (20)	2,030 ± 320 (390)
1697W0014	MW-42 LV48' (2")	-9 ± 33 (57)	-423 ± 16 (23)	6,740 ± 420 (20)	1,880 ± 320 (390)
1697W0015	MW-42 HV51' (2")	0[f] ± 33 (57)	-220 ± 10 (20)	5,260 ± 320 (20)	2,160 ± 330 (390)
1697W0016	MW-42 78' (1")	-6 ± 33 (57)	10.0 ± 6.3 (10.3)	18.9 ± 6.5 (10.4)	340 ± 240 (390)

[a]The MDCs for each radionuclide are in parentheses.

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

[c]Ni-59/63 analyzed using procedure AP17, Revision 0.

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

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

[f]Zero value is due to rounding.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

May 10, 2006

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

SUBJECT: INTERIM REPORT FOR COMPLETED ANALYSES OF TEN WATER SAMPLES COLLECTED MARCH 22, 2006 TO MARCH 24, 2006 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 ten waters samples on March 31, 2006 from the Indian Point Power Station in Buchanan, New York. This letter report contains data for technetium-99 (Tc-99), alpha spectroscopy, and plutonium-241 (Pu-241). The sample identifications and collection data are presented in Table 1, the Tc-99 data are presented in Table 2, the alpha spectroscopy data are presented in Table 3, and the Pu-241 data are presented in Table 4. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request. At present, ORISE does not participate in a performance evaluation program that includes plutonium-241, neptunium, and curium isotopes, but the Nuclear Regulatory Commission's Intercomparison Testing Program is being expanded to include these radionuclides.

This is the final interim report for this sample set. A final report combining the two interim reports will be issued by the end of May.

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:ar

Enclosure

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
E. Knox-Davin, NRC/NMSS/TWFN 8A23
M. Miller, NRC Region I
File 1697

E. Abelquist, ORISE
S. Kirk, ORISE
J. White, NRC Region I

Distribution approval and concurrence :	Initials
Technical Management Team Member	SJR
Quality Manager	CTP

P. O. Box 117
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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
1697W0001	MW-50 42'	3/22/2006	14:30
1697W0002	MW-50 67'	3/22/2006	14:40
1697W0003	MW-49 25'	3/22/2006	16:50
1697W0004	MW-49 42'	3/22/2006	16:45
1697W0005	MW-49 65.5'	3/22/2006	16:45
1697W0006	MW-42 49'	3/23/2006	11:15
1697W0007	MW-42 78'	3/24/2006	9:45
1697W0008	MW-36 26'	3/23/2006	16:00
1697W0009	MW-36 41'	3/24/2006	13:15
1697W0010	MW-36 52'	3/23/2006	16:00

TABLE 2

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)			
1697W0001	MW-50 42'	-3	±	18[b]	(31)
1697W0002	MW-50 67'	-6	±	18	(31)
1697W0003	MW-49 25'	-1	±	18	(31)
1697W0004	MW-49 42'	1	±	18	(31)
1697W0005	MW-49 65.5'	-7	±	18	(31)
1697W0006	MW-42 49'	-6	±	18	(31)
1697W0007	MW-42 78'	-14	±	18	(31)
1697W0008	MW-36 26'	6	±	18	(31)
1697W0009	MW-36 41'	9	±	19	(31)
1697W0010	MW-36 52'	14	±	19	(31)

[a]The MDCs are in parentheses.

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

TABLE 3

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN WATER SAMPLES BY ALPHA SPECTROSCOPY 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/L)			
		Am-241	Cm-242	Cm-243/244	Np-237
1697W0001	MW-50 42'	0.08 ± 0.52[b] (0.95)	0.04 ± 0.13 (0.29)	-0.19 ± 0.41 (0.85)	0.31 ± 0.21 (0.10)
1697W0002	MW-50 67'	0.19 ± 0.45 (0.79)	-0.08 ± 0.16 (0.43)	0.08 ± 0.33 (0.63)	0.00[c] ± 0.19 (0.43)
1697W0003	MW-49 25'	0.38 ± 0.47 (0.77)	0.08 ± 0.21 (0.42)	-0.41 ± 0.38 (0.86)	-0.24 ± 0.32 (0.70)
1697W0004	MW-49 42'	0.31 ± 0.41 (0.69)	0.04 ± 0.18 (0.37)	0.00 ± 0.38 (0.75)	0.10 ± 0.15 (0.25)
1697W0005	MW-49 65.5'	0.19 ± 0.51 (0.90)	-0.08 ± 0.19 (0.47)	0.12 ± 0.40 (0.74)	0.16 ± 0.23 (0.39)
1697W0006	MW-42 49'	-0.04 ± 0.45 (0.87)	-0.16 ± 0.16 (0.50)	-0.04 ± 0.39 (0.77)	-0.20 ± 0.29 (0.68)
1697W0007	MW-42 78'	0.12 ± 0.32 (0.59)	-0.15 ± 0.22 (0.55)	0.12 ± 0.30 (0.55)	0.33 ± 0.29 (0.40)
1697W0008	MW-36 26'	0.32 ± 0.30 (0.44)	-0.04 ± 0.18 (0.44)	-0.08 ± 0.32 (0.67)	0.29 ± 0.30 (0.45)
1697W0009	MW-36 41'	0.14 ± 0.41 (0.74)	0.00 ± 0.15 (0.35)	-0.04 ± 0.28 (0.58)	-0.11 ± 0.27 (0.61)
1697W0010	MW-36 52'	0.82 ± 0.68 (1.02)	0.25 ± 0.31 (0.48)	0.06 ± 0.38 (0.78)	-0.34 ± 0.30 (0.73)

TABLE 3 (Continued)

CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN WATER SAMPLES BY ALPHA SPECTROSCOPY
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/L)			
		Pu-238	Pu-239/240	U-234	U-238
1697W0001	MW-50 42'	0.51 ± 0.46 (0.72)	0.03 ± 0.15 (0.33)	0.80 ± 0.34 (0.30)	0.65 ± 0.35 (0.41)
1697W0002	MW-50 67'	0.46 ± 0.47 (0.76)	0.08 ± 0.24 (0.47)	0.44 ± 0.31 (0.40)	0.54 ± 0.30 (0.28)
1697W0003	MW-49 25'	0.65 ± 0.48 (0.72)	0.14 ± 0.31 (0.56)	1.03 ± 0.41 (0.39)	0.57 ± 0.35 (0.46)
1697W0004	MW-49 42'	0.40 ± 0.41 (0.65)	0.03 ± 0.11 (0.25)	2.18 ± 0.54 (0.23)	0.83 ± 0.32 (0.09)
1697W0005	MW-49 65.5'	0.20 ± 0.47 (0.83)	0.20 ± 0.18 (0.12)	1.58 ± 0.55 (0.44)	0.94 ± 0.41 (0.30)
1697W0006	MW-42 49'	0.20 ± 0.40 (0.71)	0.16 ± 0.30 (0.54)	1.31 ± 0.61 (0.76)	1.03 ± 0.48 (0.53)
1697W0007	MW-42 78'	0.33 ± 0.45 (0.76)	0.08 ± 0.26 (0.51)	1.89 ± 0.58 (0.45)	1.38 ± 0.48 (0.35)
1697W0008	MW-36 26'	0.37 ± 0.44 (0.72)	0.29 ± 0.22 (0.12)	0.76 ± 0.38 (0.40)	0.47 ± 0.28 (0.28)
1697W0009	MW-36 41'	0.11 ± 0.43 (0.79)	0.00 ± 0.18 (0.41)	0.17 ± 0.32 (0.56)	0.24 ± 0.28 (0.46)
1697W0010	MW-36 52'	0.15 ± 0.42 (0.76)	0.08 ± 0.19 (0.37)	1.66 ± 0.59 (0.66)	0.86 ± 0.37 (0.32)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

TABLE 4

CONCENTRATIONS OF PLUTONIUM-241 (Pu-241) IN 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	Pu-241 Concentrations[a] (pCi/L)			
1697W0001	MW-50 42'	6	±	77[b]	(131)
1697W0002	MW-50 67'	39	±	78	(132)
1697W0003	MW-49 25'	-42	±	74	(129)
1697W0004	MW-49 42'	8	±	79	(135)
1697W0005	MW-49 65.5'	-18	±	83	(142)
1697W0006	MW-42 49'	15	±	78	(134)
1697W0007	MW-42 78'	8	±	84	(143)
1697W0008	MW-36 26'	-12	±	80	(138)
1697W0009	MW-36 41'	-29	±	78	(135)
1697W0010	MW-36 52'	0[c]	±	79	(136)

[a]The MDCs are in parentheses.

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

[c]Zero values are due to rounding.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

May 2, 2006

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

SUBJECT: INTERIM REPORT FOR COMPLETED ANALYSES OF TEN WATER SAMPLES COLLECTED MARCH 22, 2006 TO MARCH 24, 2006 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 ten waters samples on March 31, 2006 from the Indian Point Power Station in Buchanan, New York. This letter report contains data for the analyses that have been completed to date. The sample identifications and collection data are presented in Table 1, the gamma spectroscopy data are presented in Table 2, the total radiostrontium data are presented in Table 3, the hard to detect beta emitter (iron-55, nickel-59/63, and tritium) data are presented in Table 4. The pertinent procedure references are provided in the specific tables.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

As more analytical data becomes available, additional interim letter reports will be issued as needed. A final report will be issued when all requested analyses are completed.

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:ar

Enclosures

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
E. Knox-Davin, NRC/NMSS/TWFN 8A23
M. Miller, NRC Region I
File 1697

E. Abelquist, ORISE
S. Kirk, ORISE
J. White, NRC Region I

Distribution approval and concurrence :	Initials
Technical Management Team Member	WCA for JSK
Quality Manager	CTP

Voice: 865.241.3242 Fax: 865.241.3248 E-mail: CondraD@orau.gov

P. O. Box 117
Oak Ridge, TN 37831

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
1697W0001	MW-50 42'	3/22/2006	14:30
1697W0002	MW-50 67'	3/22/2006	14:40
1697W0003	MW-49 25'	3/22/2006	16:50
1697W0004	MW-49 42'	3/22/2006	16:45
1697W0005	MW-49 65.5'	3/22/2006	16:45
1697W0006	MW-42 49'	3/23/2006	11:15
1697W0007	MW-42 78'	3/24/2006	9:45
1697W0008	MW-36 26'	3/23/2006	16:00
1697W0009	MW-36 41'	3/24/2006	13:15
1697W0010	MW-36 52'	3/23/2006	16:00

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/mL)			
		Co-58	Co-60	Cs-134	Cs-137
1697W0001	MW-50 42'	-1.4 ± 2.5[b]	-1.0 ± 2.7	0.5 ± 2.5	1.2 ± 2.3
1697W0002	MW-50 67'	-3.6 ± 2.9	3.1 ± 2.7	1.3 ± 2.7	-1.8 ± 4.1
1697W0003	MW-49 25'	0.6 ± 2.2	-0.5 ± 2.3	-0.9 ± 2.3	3.2 ± 2.1
1697W0004	MW-49 42'	0.1 ± 1.7	1.4 ± 2.0	1.4 ± 2.3	0.1 ± 1.7
1697W0005	MW-49 65.5'	1.4 ± 2.5	-4.0 ± 2.4	-1.1 ± 2.8	0.3 ± 2.3
1697W0006	MW-42 49'	-0.9 ± 2.3	58.7 ± 5.7	0.1 ± 2.4	4770 ± 150
1697W0007	MW-42 78'	0.6 ± 2.3	1.7 ± 2.3	3.3 ± 2.3	33.1 ± 5.1
1697W0008	MW-36 26'	1.4 ± 3.2	0.2 ± 1.8	-0.7 ± 1.8	0.2 ± 1.9
1697W0009	MW-36 41'	-0.3 ± 2.4	-0.4 ± 2.4	-1.2 ± 2.5	-1.3 ± 2.2
1697W0010	MW-36 52'	-1.2 ± 2.2	3.3 ± 3.1	0.3 ± 2.3	1.0 ± 4.4

[a]The range of MDCs for the selected radionuclides is 2.8 pCi/mL to 5.4 pCi/mL.

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

TABLE 3

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)			
1697W0001	MW-50 42'	24.5	±	1.8[b]	(1.2)
1697W0002	MW-50 67'	30.6	±	1.7	(0.8)
1697W0003	MW-49 25'	16.7	±	1.3	(0.9)
1697W0004	MW-49 42'	22.5	±	1.4	(0.8)
1697W0005	MW-49 65.5'	21.5	±	1.5	(0.8)
1697W0006	MW-42 49'	60.5	±	2.7	(0.8)
1697W0007	MW-42 78'	0.37	±	0.45	(0.75)
1697W0008	MW-36 26'	1.69	±	0.60	(0.86)
1697W0009	MW-36 41'	4.04	±	0.79	(0.96)
1697W0010	MW-36 52'	5.71	±	0.78	(0.80)

[a]MDCs are in parentheses.

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

TABLE 4

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-59[c]	Ni-63[c]	H-3[d]
1697W0001	MW-50 42'	-14 ± 72[e] (120)	4.2 ± 5.2 (8.8)	5.4 ± 5.4 (9.0)	8,190 ± 550 (400)
1697W0002	MW-50 67'	-10 ± 72 (120)	-2.4 ± 5.0 (8.8)	9.9 ± 5.5 (9.0)	9,490 ± 590 (400)
1697W0003	MW-49 25'	-48 ± 72 (120)	3.4 ± 5.2 (8.8)	6.3 ± 5.4 (9.0)	14,240 ± 740 (400)
1697W0004	MW-49 42'	-30 ± 72 (120)	7.3 ± 5.3 (8.8)	5.6 ± 5.4 (9.0)	9,130 ± 580 (400)
1697W0005	MW-49 65.5'	-33 ± 72 (120)	2.0 ± 5.2 (8.8)	7.9 ± 5.5 (9.0)	6,290 ± 490 (400)
1697W0006	MW-42 49'	-19 ± 72 (120)	71.9 ± 7.8 (8.8)	1392 ± 86 (9)	2,290 ± 340 (400)
1697W0007	MW-42 78'	-36 ± 72 (120)	2.8 ± 5.2 (8.8)	53.4 ± 7.3 (9.0)	510 ± 250 (400)
1697W0008	MW-36 26'	-39 ± 72 (120)	-3.9 ± 5.0 (8.8)	67.3 ± 8.0 (9.0)	35,100 ± 1,300 (400)
1697W0009	MW-36 41'	24 ± 73 (120)	0.1 ± 5.1 (8.8)	47.4 ± 7.0 (9.0)	56,200 ± 1,800 (400)
1697W0010	MW-36 52'	-44 ± 72 (120)	-0.3 ± 5.1 (8.8)	10.3 ± 5.5 (9.0)	26,900 ± 1,100 (400)

[a]The MDCs for each radionuclide are in parentheses.

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

[c]Ni-59/63 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.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

April 27, 2006

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

SUBJECT: INTERIM REPORT FOR ADDITIONAL ANALYSES ON SELECTED WATER SAMPLES 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 a request from you on March 23, 2006 to analyze four of the original seven water samples received on October 28, 2005 from the Indian Point Power Station in Buchanan, New York. The analytical request also included eight water samples collected from monitoring well (MW) 37 on February 28, 2006 and March 10, 2006.

The previous practice at ORISE was to wait until all analytical requests and the associated Quality Controls (QC) for a sample set were completed before submitting the required letter report. Due to the priority of the present project, ORISE will submit interim letter reports as each analytical request is completed and submit a final report after all work for a sample set has been completed.

Four of the original seven water samples and four of the eight samples from MW 37 were analyzed for Ni-63 by liquid scintillation analysis (Procedures AP12, Revision 4 and CP4, Revision 3). In addition, americium-241, curium-242, curium-243/244, plutonium-238, and plutonium-239/240 were analyzed by alpha spectroscopy (AS) (Procedures AP11, Revision 3 and CP2, Revision 12). The sample identifications and collection data are presented in Table 1, the Ni-63 data are presented in Table 2, and the AS data are presented in Table 3.

ORISE's QC requirements were met for these analyses. The QC files are available for your review upon request.

As more analytical data becomes available, additional letter reports will be issued as needed.

P. O. Box 117
Oak Ridge, TN 37831

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:ar

Enclosures

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
E. Knox-Davin, NRC/NMSS/TWFN 8A23
M. Miller, NRC Region I
File 1677
E. Abelquist, ORISE
S. Kirk, ORISE
J. White, NRC Region I

Distribution approval and concurrence :	Initials
Technical Management Team Member	JSK
Quality Manager	QTP

Voice: 865.241.3242 Fax: 865.241.3248 E-mail: CondraD@orau.gov

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
1677W0001	Unit 2 SFP	10/21/2005	12:45
1677W0002	Unit 1 West SFP	10/20/2005	--[a]
1677W0003	Unit 1 SFDS	10/19/2005	8:25
1677W0006	NCD Composite	10/21/2005	12:45
1677W0035	MW-37 22'	2/28/2006	10:20
1677W0036	MW-37 32'	2/28/2006	12:00
1677W0037	MW-37 40'	2/28/2006	11:40
1677W0038	MW-37 57'	2/28/2006	13:35
1677W0039	MW-37 40'	3/10/2006	10:25
1677W0040	MW-37 22'	3/10/2006	10:35
1677W0041	MW-37 57'	3/10/2006	11:45
1677W0042	MW-37 32'	3/10/2006	12:50

[a]No collection time provided.

TABLE 2

CONCENTRATIONS OF Ni-63 IN SELECTED WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP12, REVISION 4; 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)
1677W0001	Unit 2 SFP	2,820,000 ± 160,000 (67)
1677W0002	Unit 1 West SFP	333,000 ± 19,000 (23)
1677W0003	Unit 1 SFDS	11 ± 11 (19)
1677W0006	NCD Composite	86 ± 13 (36)
1677W0039	MW-37 40'	-1 ± 11 (19)
1677W0040	MW-37 22'	5 ± 11 (19)
1677W0041	MW-37 57'	5 ± 11 (19)
1677W0042	MW-37 32'	3 ± 11 (19)

[a]MDCs are in parenthesis.

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

TABLE 3

CONCENTRATIONS OF SELECTED ALPHA EMITTING RADIONUCLIDES IN WATER SAMPLES BY ALPHA SPECTROSCOPY 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/L)				
		Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240
1677W0001	Unit 2 SFP	9.30 ± 1.1[b]	50.0 ± 4.6	59.2 ± 4.8	24.0 ± 2.2	4.26 ± 0.63
1677W0002	Unit 1 West SFP	3.40 ± 0.65	0.55 ± 0.39	0.39 ± 0.23	0.63 ± 0.31	0.55 ± 0.24
1677W0003	Unit 1 SFDS	0.28 ± 0.30	-0.19 ± 0.34	-0.05 ± 0.24	0.02 ± 0.17	0.00[c] ± 0.13
1677W0006	NCD Composite	0.07 ± 0.20	0.04 ± 0.20	-0.09 ± 0.14	0.05 ± 0.19	-0.05 ± 0.08
1677W0035	MW-37 22'	0.00 ± 0.28	0.13 ± 0.13	-0.06 ± 0.17	-0.11 ± 0.22	0.16 ± 0.11
1677W0036	MW-37 32'	0.11 ± 0.24	0.00 ± 0.10	0.11 ± 0.23	0.09 ± 0.20	0.04 ± 0.10
1677W0037	MW-37 40'	0.30 ± 0.31	0.12 ± 0.21	0.13 ± 0.24	-0.02 ± 0.22	0.05 ± 0.07
1677W0038	MW-37 57'	-0.20 ± 0.21	0.30 ± 0.20	-0.04 ± 0.15	-0.12 ± 0.18	0.04 ± 0.11

[a]The average MDCs for these radionuclides range from 0.05 pCi/L to 0.52 pCi/L.

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

[c]Zero value is due to rounding.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

April 7, 2006

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

SUBJECT: REPORT FOR ANALYSIS OF FIFTH SET OF WATER SAMPLES FROM THE INDIAN POINT POWER STATION, BUCHANAN, NEW YORK [INSPECTION NO. 050-247/2005-011] [RFTA NO. 06-001]

Dear Mr. Kottan:

The Oak Ridge Institute for Science and Education (ORISE) received four water samples on March 6, 2006 from the Indian Point Power Station in Buchanan, New York. The sample identifications and collection data are presented in Table 1. The samples were analyzed by gamma spectroscopy (GS) (Procedure CP1, Revision 15), for tritium (H-3) by liquid scintillation analysis (Procedure AP2, Revision 15; Procedure CP4, Revision 3), and for total radiostrontium (Sr) by gas-flow proportional counting (Procedure AP4, Revision 13; Procedure CP3, Revision 2). The GS, H-3, and Sr results are presented in Tables 2 through 4, respectively.

After discussing the preliminary results of the Sr analysis with you on March 20, 2006, you requested that the samples be reanalyzed to confirm the Sr data. The reanalysis began on March 21, 2006 and finished on March 29, 2006. The Sr reanalysis data are reported in Table 4. The uncertainties and minimum detectable concentrations are higher due to the sample volumes available for the reanalysis.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

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

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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
1677W0035	MW-37 22'	2/28/2006	10:20
1677W0036	MW-37 32'	2/28/2006	12:00
1677W0037	MW-37 40'	2/28/2006	11:40
1677W0038	MW-37 57'	2/28/2006	13:35

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
1677W0035	MW-37 22'	6.1 ± 5.3[b]	5.4 ± 5.6	3.3 ± 5.5	-0.4 ± 4.8
1677W0036	MW-37 32'	-2.0 ± 4.9	7.2 ± 5.3	4.7 ± 5.7	0.4 ± 4.8
1677W0037	MW-37 40'	-1.4 ± 4.5	1.2 ± 4.8	1.7 ± 5.2	1.1 ± 4.2
1677W0038	MW-37 57'	-2.8 ± 5.9	-4.3 ± 6.3	5.9 ± 6.8	3.8 ± 6.0

[a]The range of MDCs for the selected radionuclides is 7.2 pCi/L to 11 pCi/L.

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

TABLE 3

CONCENTRATIONS OF TRITIUM IN WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP2, REVISION 15; 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)
1677W0035	MW-37 22'	14,470 ± 360[b] (200)
1677W0036	MW-37 32'	29,720 ± 560 (200)
1677W0037	MW-37 40'	15,990 ± 390 (200)
1677W0038	MW-37 57'	15,850 ± 380 (200)

[a]MDCs are in parenthesis.

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

TABLE 4

CONCENTRATIONS OF TOTAL RADIOSTRONTIUM IN WATER SAMPLES BY GAS-FLOW PROPORTIONAL 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)
1677W0035	MW-37 22'	2.3 ± 1.2[b] (2.0)
1677W0036	MW-37 32'	26.4 ± 2.1 (2.0)
1677W0037	MW-37 40'	21.8 ± 1.8 (1.9)
1677W0038	MW-37 57'	25.5 ± 2.1 (2.2)
1677W0035R[c]	MW-37 22'	3.7 ± 1.9 (3.1)
1677W0036R	MW-37 32'	24.2 ± 2.8 (3.2)
1677W0037R	MW-37 40'	21.8 ± 4.0 (5.4)
1677W0038R	MW-37 57'	28.5 ± 2.9 (3.2)

[a]MDCs are in parenthesis.

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

[c]The samples with the R extension were reanalyzed at the inspector's request.

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

April 4, 2006

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

SUBJECT: REPORT FOR ANALYSIS OF SIXTH SET OF WATER SAMPLES FROM THE INDIAN POINT POWER STATION, BUCHANAN, NEW YORK [INSPECTION REPORT NO. 050-247/2005-011] [RFTA NO. 06-001]

Dear Mr. Kottan:

The Oak Ridge Institute for Science and Education (ORISE) received four water samples on March 15, 2006 from the Indian Point Power Station in Buchanan, New York. The sample identifications and collection data are presented in Table 1. The samples were analyzed by gamma spectroscopy (GS) (Procedure CP1, Revision 15), for tritium (H-3) by liquid scintillation analysis (Procedure AP2, Revision 15; Procedure CP4, Revision 3), and for total radiostrontium (Sr) by gas-flow proportional counting (Procedure AP4, Revision 13; Procedure CP3, Revision 2). The GS, H-3, and Sr results are presented in Tables 2 through 4, respectively.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

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:ar

Enclosures

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
E. Knox-Davin, NRC/NMSS/TWFN 8A23
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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
1677W0039	MW-37 40'	3/10/2006	10:25
1677W0040	MW-37 22'	3/10/2006	10:35
1677W0041	MW-37 57'	3/10/2006	11:45
1677W0042	MW-37 32'	3/10/2006	12:50

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
1677W0039	MW-37 40'	1.3 ± 3.7[b]	2.2 ± 3.2	-3.9 ± 5.5	2.7 ± 3.1
1677W0040	MW-37 22'	0.6 ± 3.5	-1.7 ± 3.1	0.1 ± 3.3	2.3 ± 2.9
1677W0041	MW-37 57'	0.8 ± 3.8	-1.1 ± 3.9	-1.1 ± 4.1	2.5 ± 3.6
1677W0042	MW-37 32'	-1.9 ± 2.4	-1.7 ± 2.6	0.1 ± 2.8	-1.1 ± 2.4

[a]The range of MDCs for the selected radionuclides is 3.9 pCi/L to 6.1 pCi/L.

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

TABLE 3

CONCENTRATIONS OF TRITIUM IN WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP2, REVISION 15; 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)
1677W0039	MW-37 40'	16,140 ± 400[b] (200)
1677W0040	MW-37 22'	22,950 ± 490 (200)
1677W0041	MW-37 57'	15,940 ± 390 (200)
1677W0042	MW-37 32'	28,840 ± 570 (200)

[a]MDCs are in parenthesis.

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

TABLE 4

CONCENTRATIONS OF TOTAL RADIOSTRONTIUM IN WATER SAMPLES BY GAS-FLOW PROPORTIONAL 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)
1677W0039	MW-37 40'	17.6 ± 1.9[b] (1.6)
1677W0040	MW-37 22'	4.9 ± 1.3 (1.6)
1677W0041	MW-37 57'	26.6 ± 2.2 (1.5)
1677W0042	MW-37 32'	21.6 ± 2.0 (1.6)

[a]MDCs are in parenthesis.

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

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

March 14, 2006

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

SUBJECT: REPORT FOR ANALYSIS OF FOURTH SET OF WATER SAMPLES FROM THE INDIAN POINT POWER STATION, BUCHANAN, NEW YORK [INSPECTION NO. 050-247/2005-011] [RFTA NO. 06-001]

Dear Mr. Kottan:

The Oak Ridge Institute for Science and Education (ORISE) received 17 water samples on February 13, 2006 from the Indian Point Power Station in Buchanan, New York. The sample identifications and collection data are presented in Table 1. The samples were analyzed by gamma spectroscopy (GS) (Procedure CP1, Revision 15), for tritium (H-3) by liquid scintillation analysis (Procedure AP2, Revision 15; Procedure CP4, Revision 3), and for total radiostrontium (Sr) by gas-flow proportional counting (Procedure AP4, Revision 13; Procedure CP3, Revision 2). The GS, H-3, and Sr results are presented in Tables 2-4, respectively.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

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:ar

Enclosures

c: T. McLaughlin, NRC/NMSS/TWFN 7F27
E. Knox-Davin, NRC/NMSS/TWFN 8A23
M. Miller, NRC Region I
J. Noggle, NRC Region I
E. Abelquist, ORISE
S. Kirk, ORISE
J. White, NRC Region I
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Distribution approval and concurrence :	Initials
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TABLE 1

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

ORISE Sample ID	NRC Region 1 Sample ID	Collection Date	Collection Time
1677W0018	MW-48	02/08/2006	1010
1677W0019	MW-38	02/08/2006	1115
1677W0020	Trap Rock Quarry	02/08/2006	1200
1677W0021	Gypsum Plant Stream	02/08/2006	1240
1677W0022	Algonquin Outfall	02/08/2006	1240
1677W0023	MW-31	02/07/2006	0940
1677W0024	MW-30	02/07/2006	1140
1677W0025	MW-32	02/07/2006	1345
1677W0026	MW-35	02/07/2006	1440
1677W0027	MW-34	02/07/2006	1515
1677W0028	MW-33	02/07/2006	1600
1677W0029	MW-111	02/07/2006	1610
1677W0030	MW-36	02/07/2006	1700
1677W0031	MH-1 Storm Drain Area	02/08/2006	1250
1677W0032	Middle of Site	02/08/2006	1300
1677W0033	Off of Unit 2	02/08/2006	1300
1677W0034	N. Property Boundary	02/08/2006	1300

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
1677W0018	MW-48	-4.0 ± 7.2[b]	4.3 ± 6.2	3.0 ± 5.7	-2 ± 10
1677W0019	MW-38	-2.0 ± 5.8	0.6 ± 5.4	1.8 ± 6.0	-0.1 ± 4.9
1677W0020	Trap Rock Quarry	2.2 ± 4.4	0.2 ± 4.7	2.7 ± 6.2	1.2 ± 4.4
1677W0021	Gypsum Plant Stream	4.7 ± 6.3	1.8 ± 5.7	3.2 ± 8.0	8.1 ± 5.3
1677W0022	Algonquin Outfall	1.7 ± 7.6	5.2 ± 5.6	-0.5 ± 6.2	13.9 ± 7.2
1677W0023	MW-31	-1.2 ± 5.8	-4.4 ± 6.4	0.4 ± 6.4	1.2 ± 5.2
1677W0024	MW-30	-4.9 ± 4.7	1.0 ± 5.9	-1.0 ± 4.9	-0.5 ± 5.2
1677W0025	MW-32	-1.0 ± 5.9	-1.6 ± 5.8	-4.1 ± 6.6	-1.3 ± 5.2
1677W0026	MW-35	-7.5 ± 7.4	5.9 ± 5.9	0.3 ± 5.8	-4 ± 11
1677W0027	MW-34	-1.1 ± 5.3	1.3 ± 5.4	-2.8 ± 5.5	-1.7 ± 5.3
1677W0028	MW-33	-2.3 ± 4.6	1.8 ± 4.8	-1.6 ± 4.9	-0.1 ± 4.5
1677W0029	MW-111	-2.0 ± 5.7	3.0 ± 5.7	3.5 ± 6.6	3.7 ± 5.3
1677W0030	MW-36	-1.5 ± 7.4	4.2 ± 6.6	1.9 ± 5.5	-6 ± 10
1677W0031	MH-1 Storm Drain Area	-0.4 ± 5.0	4.0 ± 6.5	-1.8 ± 5.4	-0.7 ± 4.9
1677W0032	Middle of Site	-2.2 ± 4.5	2.0 ± 4.7	-3.0 ± 4.8	-2.0 ± 4.4
1677W0033	Off of Unit 2	-0.9 ± 5.8	1.1 ± 5.6	-2.6 ± 6.3	2.3 ± 5.1
1677W0034	N. Property Boundary	-1.4 ± 4.6	-1.6 ± 4.7	0.3 ± 4.8	1.6 ± 4.3

[a]The range of MDCs for the selected radionuclides is 7.3 pCi/L to 11 pCi/L.

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

TABLE 3

CONCENTRATIONS OF TRITIUM IN WATER SAMPLES BY LIQUID SCINTILLATION ANALYSIS AP2, REVISION 15; CP4, REVISION 3 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Tritium Concentrations, TPUs, and MDCs[a] (pCi/L)
1677W0018	MW-48	70 ± 120[b] (200)
1677W0019	MW-38	310 ± 130 (200)
1677W0020	Trap Rock Quarry	-140 ± 110 (200)
1677W0021	Gypsum Plant Stream	-210 ± 110 (200)
1677W0022	Algonquin Outfall	-110 ± 120 (200)
1677W0023	MW-31	32,910 ± 470 (200)
1677W0024	MW-30	491,400 ± 5,100 (200)
1677W0025	MW-32	17,900 ± 310 (200)
1677W0026	MW-35	84,530 ± 990 (200)
1677W0027	MW-34	174,700 ± 1,900 (200)
1677W0028	MW-33	222,700 ± 2,400 (200)
1677W0029	MW-111	242,400 ± 2,600 (200)
1677W0030	MW-36	21,710 ± 350 (200)
1677W0031	MH-1 Storm Drain Area	-80 ± 120 (200)
1677W0032	Middle of Site	-170 ± 110 (200)
1677W0033	Off of Unit 2	-60 ± 120 (200)
1677W0034	N. Property Boundary	-100 ± 120 (200)

[a]MDCs are in parenthesis.

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

TABLE 4

CONCENTRATIONS OF TOTAL RADIOSTRONTIUM IN WATER SAMPLES BY GAS-FLOW PROPORTIONAL COUNTING AP4, REVISION 13; CP3, REVISION 2 INDIAN POINT POWER STATION BUCHANAN, NEW YORK

ORISE Sample ID	NRC Region I Sample ID	Total Radiostrontium Concentrations, TPUs, and MDCs[a] (pCi/L)
1677W0018	MW-48	0.6 ± 1.1[b] (1.9)
1677W0019	MW-38	0.4 ± 1.0 (1.7)
1677W0020	Trap Rock Quarry	0.4 ± 1.1 (1.8)
1677W0021	Gypsum Plant Stream	1.1 ± 1.1 (1.8)
1677W0022	Algonquin Outfall	0.8 ± 1.1 (1.9)
1677W0023	MW-31	0.2 ± 1.1 (2.0)
1677W0024	MW-30	0.7 ± 1.0 (1.8)
1677W0025	MW-32	0.2 ± 1.1 (1.9)
1677W0026	MW-35	-0.1 ± 1.1 (1.8)
1677W0027	MW-34	0.3 ± 1.0 (1.7)
1677W0028	MW-33	1.0 ± 1.2 (2.0)
1677W0029	MW-111	1.9 ± 1.2 (1.9)
1677W0030	MW-36	2.4 ± 1.2 (1.9)
1677W0031	MH-1 Storm Drain Area	0.8 ± 1.0 (1.7)
1677W0032	Middle of Site	0.7 ± 1.1 (1.8)
1677W0033	Off of Unit 2	0.2 ± 1.3 (2.3)
1677W0034	N. Property Boundary	0.9 ± 1.0 (1.7)

[a]*MDCs are in parenthesis.*

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