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**ORISE**  
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

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RECEIVED  
REGION I

June 2, 2004

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

**SUBJECT: REPORT FOR ANALYSIS OF SAMPLES COLLECTED DURING THE PERIOD APRIL 27, 2004 THROUGH APRIL 30, 2004 FROM THE ROYERSFORD WASTEWATER TREATMENT FACILITY ROYERSFORD, PENNSYLVANIA AND THE POTTSTOWN WASTEWATER TREATMENT FACILITY POTTSTOWN, PENNSYLVANIA (DOCKET NO. 030-20934, RFTA NO04-001)**

Dear Mr. Kottan:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) received 17 samples on April 30, 2004 from the Royersford and Pottstown Wastewater Treatment Facilities. In your phone conversation with Wade Ivey on April 30, 2004, you requested that the receiving date serve as the collection date for the six samples from the secondary digester of the Royersford facility.

A portion of each sample was used to determine the moisture and solid content using the sample preparation procedure (SP3, Revision 2). Gamma spectroscopy (CP1, Revision 13) was performed on each sample as they were received. On May 5, 2004 during a phone conversation, you requested that the six secondary digester samples taken at the Royersford facility be analyzed for total radiostrontium (AP4, Revision 12 and CP3, Revision 2). The results of the moisture content, gamma spectroscopy, and total radiostrontium are presented in Tables 1 through 3, respectively. The results are presented in pCi/L for the liquid samples, whereas the results for the solid samples are presented as pCi/g wet weight for gamma spectroscopy and as pCi/g dry weight for total radiostrontium.

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

P. O. BOX 117, OAK RIDGE, TENNESSEE 37831-0117

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Mr. James Kottan

-2-

June 2, 2004

Please contact me at (865) 241-3242 or Wade Ivey at (865) 576-9184 with any questions or comments.

Sincerely,



Dale Condra  
Laboratory Manager  
Environmental Survey and  
Site Assessment Program

RDC/WPI:ar

Enclosure

cc: T. McLaughlin, NRC/NMSS/TWFN 7F27 E. Abelquist, ORISE/ESSAP  
E. Knox-Davin, NRC/NMSS/TWFN T8A23 T. Vitkus, ORISE/ESSAP  
B. Ullrich, NRC/Region I File/889

Distribution approval and concurrence:	Initials	Date
Technical Management Team Member	TJN	6/2/2004
Quality Manager	ATP	6/2/04

**ORISE TABLE 1**

**PERCENT MOISTURE AND SOLIDS  
IN LIQUID AND SOLID SAMPLES  
SP3, REVISION 2**

**ROYERSFORD AND POTTSTOWN WASTEWATER TREATMENT FACILITIES  
ROYERSFORD AND POTTSTOWN, PENNSYLVANIA**

<b>ESSAP Sample ID</b>	<b>NRC Region I Sample ID</b>	<b>Percent Moisture</b>	<b>Percent Solids</b>
889M001	secondary digester	97.7	2.3
889M002	secondary digester	97.6	2.4
889M003	secondary digester	96.7	3.3
889M004	secondary digester	75	25
889M005	secondary digester	75	25
889M006	secondary digester	70	30
889M007	Pottstown A-1	76	24
889M008	Pottstown A-2	68	32
889M009	Pottstown B-1	85	15
889M010	Pottstown B-2	82	18
889M011	Pottstown C-1	81	19
889M012	Pottstown C-2	84	16
889M013	Pottstown T-5	96.1	3.9
889M014	Pottstown T-5-2	97.6	2.4
889M015	Pottstown T-5-3	97.3	2.7
889M016	Grows Landfill-front	86	14
889M017	Grows Landfill-rear	83	17

ORISE TABLE 2

SELECTED GAMMA EMITTING RADIONUCLIDE CONCENTRATIONS  
 IN LIQUID AND SOLID SAMPLES  
 BY GAMMA SPECTROSCOPY  
 CP1, REVISION 13  
 ROYERSFORD AND POTTSTOWN WASTEWATER TREATMENT FACILITIES  
 ROYERSFORD AND POTTSTOWN, PENNSYLVANIA

ESSAP SAMPLE ID	NRC Region I Sample ID	Radionuclide Concentrations (pCi/L or pCi/g) <sup>†</sup>			
		Mn-54	Co-58	Co-60	Zn-65
889M001	secondary digester	5.39 ± 0.26 <sup>b</sup> (0.11) <sup>c</sup>	0.79 ± 0.14 (0.11)	17.32 ± 0.61 (0.11)	0.82 ± 0.27 (0.29)
889M002	secondary digester	5.95 ± 0.29 (0.13)	1.00 ± 0.17 (0.12)	19.66 ± 0.72 (0.11)	0.84 ± 0.27 (0.31)
889M003	secondary digester	6.91 ± 0.30 (0.10)	0.93 ± 0.10 (0.10)	22.14 ± 0.74 (0.10)	0.98 ± 0.22 (0.24)
889M004	secondary digester	27.9 ± 1.1 (0.33)	5.31 ± 0.42 (0.32)	127.2 ± 4.0 (0.30)	6.70 ± 0.97 (0.79)
889M005	secondary digester	30.7 ± 1.2 (0.38)	5.20 ± 0.47 (0.38)	151.7 ± 4.9 (0.35)	6.7 ± 1.0 (0.93)
889M006	secondary digester	34.9 ± 1.3 (0.30)	6.53 ± 0.40 (0.30)	154.6 ± 4.8 (0.32)	7.30 ± 0.79 (0.74)
889M007	Pottstown A-1	14.42 ± 0.64 (0.23)	1.50 ± 0.19 (0.17)	52.7 ± 1.8 (0.21)	2.13 ± 0.54 (0.55)
889M008	Pottstown A-2	20.87 ± 0.90 (0.31)	2.86 ± 0.33 (0.31)	72.3 ± 2.4 (0.32)	4.69 ± 0.76 (0.77)
889M009	Pottstown B-1	8.28 ± 0.41 (0.19)	0.98 ± 0.16 (0.18)	26.53 ± 0.95 (0.18)	1.15 ± 0.46 (0.43)
889M010	Pottstown B-2	10.13 ± 0.50 (0.22)	1.19 ± 0.22 (0.22)	35.6 ± 1.3 (0.21)	2.03 ± 0.62 (0.54)
889M011	Pottstown C-1	10.82 ± 0.46 (0.15)	1.32 ± 0.17 (0.15)	36.7 ± 1.2 (0.16)	1.50 ± 0.39 (0.38)
889M012	Pottstown C-2	7.65 ± 0.34 (0.12)	0.94 ± 0.13 (0.12)	27.38 ± 0.90 (0.12)	1.50 ± 0.31 (0.28)
889M013	Pottstown T-5	2.09 ± 0.21 (0.12)	0.27 ± 0.12 (0.11)	6.78 ± 0.36 (0.11)	0.47 ± 0.22 (0.27)
889M014	Pottstown T-5-2	0.70 ± 0.07 (0.05)	0.11 ± 0.04 (0.05)	2.54 ± 0.16 (0.05)	0.18 ± 0.11 (0.12)
889M015	Pottstown T-5-3	0.97 ± 0.10 (0.06)	0.12 ± 0.05 (0.05)	3.31 ± 0.19 (0.06)	0.12 ± 0.12 (0.14)
889M016	Grows Landfill-front	10.24 ± 0.50 (0.19)	1.27 ± 0.24 (0.20)	35.2 ± 1.3 (0.19)	1.44 ± 0.56 (0.49)
889M017	Grows Landfill-rear	11.90 ± 0.53 (0.20)	1.51 ± 0.19 (0.20)	37.8 ± 1.3 (0.18)	2.45 ± 0.53 (0.48)

ORISE TABLE 2 (continued)

SELECTED GAMMA EMITTING RADIONUCLIDE CONCENTRATIONS  
IN LIQUID AND SOLID SAMPLES  
BY GAMMA SPECTROSCOPY  
CP1, REVISION 13  
ROYERSFORD AND POTTSTOWN WASTEWATER TREATMENT FACILITIES  
ROYERSFORD AND POTTSTOWN, PENNSYLVANIA

ESSAP SAMPLE ID	NRC Region I Sample ID	Radionuclide Concentrations (pCi/L or pCi/g) <sup>a</sup>		
		I-131	Sb-125	Cs-137
889M001	secondary digester	0.01 ± 0.06 <sup>b</sup> (0.09) <sup>c</sup>	0.26 ± 0.16 (0.23)	1.20 ± 0.11 (0.10)
889M002	secondary digester	-0.03 ± 0.06 (0.10)	0.34 ± 0.18 (0.25)	1.28 ± 0.12 (0.12)
889M003	secondary digester	-0.02 ± 0.05 (0.08)	0.37 ± 0.17 (0.21)	1.51 ± 0.10 (0.09)
889M004	secondary digester	-0.07 ± 0.15 (0.25)	1.78 ± 0.44 (0.65)	7.91 ± 0.42 (0.28)
889M005	secondary digester	-0.11 ± 0.18 (0.29)	1.47 ± 0.55 (0.74)	8.90 ± 0.49 (0.33)
889M006	secondary digester	0.10 ± 0.14 (0.23)	2.10 ± 0.50 (0.59)	9.22 ± 0.45 (0.26)
889M007	Pottstown A-1	0.05 ± 0.02 (0.02)	0.83 ± 0.41 (0.46)	3.25 ± 0.25 (0.21)
889M008	Pottstown A-2	0.83 ± 0.26 (0.31)	0.68 ± 0.40 (0.59)	4.19 ± 0.30 (0.26)
889M009	Pottstown B-1	1.76 ± 0.24 (0.18)	0.61 ± 0.29 (0.36)	1.87 ± 0.17 (0.16)
889M010	Pottstown B-2	2.15 ± 0.26 (0.20)	0.26 ± 0.28 (0.43)	2.08 ± 0.20 (0.19)
889M011	Pottstown C-1	1.72 ± 0.20 (0.15)	0.37 ± 0.22 (0.30)	2.09 ± 0.15 (0.13)
889M012	Pottstown C-2	1.12 ± 0.15 (0.12)	0.29 ± 0.17 (0.23)	1.51 ± 0.11 (0.10)
889M013	Pottstown T-5	0.48 ± 0.16 (0.12)	0.10 ± 0.13 (0.23)	0.48 ± 0.10 (0.10)
889M014	Pottstown T-5-2	0.18 ± 0.06 (0.05)	0.04 ± 0.06 (0.11)	0.18 ± 0.05 (0.05)
889M015	Pottstown T-5-3	0.01 ± 0.00 <sup>d</sup> (0.01)	0.03 ± 0.06 (0.12)	0.23 ± 0.06 (0.07)
889M016	Grows Landfill-front	0.39 ± 0.16 (0.19)	0.38 ± 0.26 (0.39)	2.19 ± 0.19 (0.18)
889M017	Grows Landfill-rear	0.42 ± 0.15 (0.19)	0.59 ± 0.28 (0.39)	2.53 ± 0.19 (0.17)

<sup>a</sup>Samples 889M001-M003 and 889M013-M015 are pCi/L and all other samples are pCi/g wet material.

<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

<sup>c</sup>MDC values are in parenthesis.

<sup>d</sup>Zero value due to rounding.

**ORISE TABLE 3**

**TOTAL RADIOSTRONTIUM CONCENTRATIONS  
IN LIQUID AND SOLID SAMPLES  
BY LOW BACKGROUND BETA COUNTING  
AP4, REVISION 12; CP3, REVISION 2  
ROYERSFORD WASTEWATER TREATMENT FACILITY  
ROYERSFORD, PENNSYLVANIA**

<b>ESSAP SAMPLE ID</b>	<b>NRC REGION I SAMPLE ID</b>	<b>Total Sr Concentrations (pCi/L or pCi/g)<sup>a</sup></b>	<b>MDC (pCi/L or pCi/g)</b>
889M001	secondary digester	0.45 ± 0.15 <sup>b</sup>	0.22
889M002	secondary digester	1.38 ± 0.21	0.23
889M003	secondary digester	0.87 ± 0.19	0.23
889M004	secondary digester	7.0 ± 3.1	4.7
889M005	secondary digester	17.6 ± 3.4	4.1
889M006	secondary digester	13.9 ± 4.5	6.3

<sup>a</sup>Samples 889M001-M003 are pCi/L and samples 889M004-M006 are pCi/g dry material.

<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.