

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

August 17, 2006

Mr. James Cameron
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Lisle, IL 60532-4351

**SUBJECT: REPORT OF ANALYTICAL RESULTS FOR SIX WATER SAMPLES,
BATCH FIVE, FROM THE VICINITY OF THE ZION NUCLEAR
STATION, ZION, ILLINOIS
[INSPECTION REPORT NO. 050-00295/2006-001] (RFTA NO. 06-001)**

Dear Mr. Cameron:

The Oak Ridge Institute for Science and Education (ORISE) received Batch Five, consisting of six water samples, on August 2, 2006. These samples were collected in the vicinity of the Zion Nuclear Station in Zion, Illinois. The six water samples were analyzed for tritium to a minimum detectable concentration of 180 pCi/L using a liquid scintillation analyzer. The chain-of-custody identified one water sample to be analyzed by gamma spectroscopy (GS). The sample identifications and collection data are presented in Table 1. The GS data are presented in Table 2. The tritium data are presented in Table 3. The pertinent procedure references are provided in the specific tables.

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:ess

Enclosures

c: B. Watson, NMSS/DWMEP/DD/SP 7E18
E. Knox-Davin, NRC/NMSS/TWFN 8A23
File 1701

E. Abelquist, ORISE
S. Kirk, ORISE

Distribution approval and concurrence :	Initials
Technical Management Team Member	<i>[Signature]</i>
Quality Manager	<i>ATP</i>

Voice: 865.241.3242

Fax: 865.241.3248

E-mail: CondraD@ornl.gov

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TABLE 1

**SAMPLE IDENTIFICATIONS
AND COLLECTION DATA
ZION NUCLEAR STATION
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Collection Time	Collection Date
1701W0031	Z-06-5-01	7/28/2006	10:14 AM
1701W0032	Z-06-5-02	7/28/2006	11:24 AM
1701W0033	Z-06-5-03	7/28/2006	10:54 AM
1701W0034	Z-06-5-04	7/28/2006	9:32 AM
1701W0035	Z-06-5-05	6/28/2006	NDP ^a
1701W0036	Z-06-5-06	6/28/2006	NDP

^aNo data provided.

TABLE 2

**CONCENTRATIONS OF SELECTED
GAMMA EMITTING RADIONUCLIDES
IN A SELECTED WATER SAMPLE
BY GAMMA SPECTROSCOPY CP1, REVISION 15
ZION NUCLEAR STATION
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations ^a (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1701W0032	Z-06-5-02	0.8 ± 6.2 ^b	0.5 ± 5.6	1.7 ± 5.7	5.2 ± 5.1

^aThe range of MDCs for the selected radionuclides is 9.1 pCi/L to 9.8 pCi/L.

^bUncertainties 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
ZION NUCLEAR STATION
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs ^a (pCi/L)
1701W0031	Z-06-5-01	60 ± 110 ^b (180)
1701W0032	Z-06-5-02	90 ± 110 (180)
1701W0033	Z-06-5-03	20 ± 110 (180)
1701W0034	Z-06-5-04	0 ^c ± 110 (180)
1701W0035	Z-06-5-05	110 ± 110 (180)
1701W0036	Z-06-5-06	240 ± 110 (180)

^aMDCs are in parentheses.

^bUncertainties represent the 95% confidence level, based on total propagated uncertainties.

^cZero value is due to rounding.