

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

August 3, 2006

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

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

Dear Mr. Snell:

The Oak Ridge Institute for Science and Education (ORISE) received Batch Three, consisting of two water samples, on July 7, 2006. These samples were collected in the vicinity of the Zion Station in Zion, Illinois. The two water samples were analyzed for tritium to a minimum detection 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:ar

Enclosures

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**TABLE 1**

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

<b>ORISE Sample ID</b>	<b>NRC Region III Sample ID</b>	<b>Collection Time</b>	<b>Collection Date</b>
1701W0025	Z-06-3-01	6/28/2006	10:50 AM
1701W0026	Z-06-3-02	6/28/2006	12:40 PM

**TABLE 2**

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

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1701W0026	Z-06-3-02	1.3 ± 2.2 <sup>b</sup>	0.2 ± 2.3	0.3 ± 2.3	1.6 ± 2.1

<sup>a</sup>The range of MDCs for the selected radionuclides is 3.8 pCi/L to 4.0 pCi/L.

<sup>b</sup>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  
ZION GENERATING STATION  
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)			
1701W0025	Z-06-3-01	240 <sup>b</sup>	±	110	(180)
1701W0026	Z-06-3-02	320	±	110	(180)

<sup>a</sup>MDCs are in parentheses.

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