

August 17, 2006

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

**SUBJECT: ANALYTICAL RESULTS FOR THREE WATER SAMPLES IN BATCH SIX FROM THE VICINITY OF THE BYRON GENERATING STATION, BYRON, ILLINOIS**  
[INSPECTION REPORT NO. 050-00454/2006-004] (RFTA NO. 06-001)

Dear Mr. Cameron:

The Oak Ridge Institute for Science and Education (ORISE) received Batch Six, consisting of three water samples on August 2, 2006 that were collected in the vicinity of the Byron Generating Station in Byron, Illinois. The 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, Manager  
Laboratory

RDC:WPI:ess

Enclosures

c: B. Watson, NMSS/DWMEP/DD/SP 7E18  
E. Knox-Davin, NRC/NMSS/TWFFN 8A23  
File 1689  
E. Abelquist, ORISE  
S. Kirk, ORISE

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

Voice: 865.241.3242

Fax: 865.241.3248

E-mail: CondraD@ornl.gov

TABLE 1

SAMPLE IDENTIFICATIONS  
AND COLLECTION DATA  
BYRON GENERATING STATION  
BYRON, ILLINOIS

ORISE Sample ID	NRC Region III Sample ID	Collection Date	Collection Time
1689W0080	BY-06-6-01	7/20/06	09:20
1689W0081	BY-06-6-02	7/20/06	09:40
1689W0082	BY-06-6-03	7/20/06	10:21

TABLE 2

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

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1689W0082	BY-06-6-03	1.5 ± 6.2 <sup>b</sup>	3.2 ± 5.2	4.0 ± 5.7	-3.3 ± 8.6

<sup>a</sup>The range of MDCs for the selected radionuclides is 9.2 pCi/L to 9.7 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  
 BYRON GENERATING STATION  
 BYRON, ILLINOIS

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)			
1689W0080	BY-06-6-01	590	±	120 <sup>h</sup>	(180)
1689W0081	BY-06-6-02	380	±	120	(180)
1689W0082	BY-06-6-03	3,120	±	200	(180)

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

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