

ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

March 14, 2006

BY-2006-01

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

SUBJECT: ANALYTICAL RESULTS FOR 21 WATER SAMPLES FROM THE VICINITY OF THE BYRON GENERATING STATION, BYRON, ILLINOIS [INSPECTION REPORT NO. 050-454/2006-002] (RFTA NO. 06-001)

Dear Mr. Snell:

The Oak Ridge Institute for Science and Education (ORISE) received 21 water samples on March 3, 2006 that were collected in the vicinity of the Byron Generating Station in Byron, Illinois on February 28, 2006. The samples were analyzed for tritium using a liquid scintillation analyzer (Procedures AP2, Revision 15 and CP4, Revision 3). The sample identifications and collection data are presented in Table 1. The tritium data are presented in Table 2.

During a phone conversation on March 7, 2006, you indicated that one in ten water samples for which the tritium minimum detectable concentration (MDC) was 200 pCi/L should be counted by gamma spectroscopy (GS). ORISE selected samples BY-DW-06-1-06 (1689W0006) and BY-DW-06-1-16 (1689W0016) to be analyzed by GS (Procedure CP1, Revision 15). There were no radionuclides detected by GS. The MDCs for the GS results ranged from 4.5 pCi/L for Cs-137 to 8.2 pCi/L for Co-60.

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

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TABLE 1

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

ORISE Sample ID	NRC Region III Sample ID	Collection Date	Collection Time
1689W0001	BY-DW-06-1-01	2/28/2006	10:25 AM
1689W0002	BY-DW-06-1-02	2/28/2006	10:35 AM
1689W0003	BY-DW-06-1-03	2/28/2006	11:00 AM
1689W0004	BY-DW-06-1-04	2/28/2006	10:50 AM
1689W0005	BY-DW-06-1-05	2/28/2006	10:04 AM
1689W0006	BY-DW-06-1-06	2/28/2006	9:40 AM
1689W0007	BY-DW-06-1-07	2/28/2006	9:55 AM
1689W0008	BY-DW-06-1-08	2/28/2006	9:00 AM
1689W0009	BY-DW-06-1-09	2/28/2006	11:45 AM
1689W0010	BY-DW-06-1-10	2/28/2006	11:45 AM
1689W0011	BY-DW-06-1-11	2/28/2006	11:45 AM
1689W0012	BY-DW-06-1-12	2/28/2006	10:25 AM
1689W0013	BY-DW-06-1-13	2/28/2006	10:35 AM
1689W0014	BY-DW-06-1-14	2/28/2006	11:00 AM
1689W0015	BY-DW-06-1-15	2/28/2006	10:50 AM
1689W0016	BY-DW-06-1-16	2/28/2006	10:04 AM
1689W0017	BY-DW-06-1-17	2/28/2006	9:40 AM
1689W0018	BY-DW-06-1-18	2/28/2006	9:50 AM
1689W0019	BY-DW-06-1-19	2/28/2006	8:55 AM
1689W0020	BY-DW-06-1-20	2/28/2006	10:14 AM
1689W0021	BY-DW-06-1-21	2/28/2006	11:45 AM

TABLE 2

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 ^a (pCi/L)			
1689W0001	BY-DW-06-1-01	-40	±	120 ^b	(200)
1689W0002	BY-DW-06-1-02	150	±	120	(200)
1689W0003	BY-DW-06-1-03	-20	±	120	(200)
1689W0004	BY-DW-06-1-04	-80	±	110	(200)
1689W0005	BY-DW-06-1-05	-20	±	120	(200)
1689W0006	BY-DW-06-1-06	0 ^c	±	120	(200)
1689W0007	BY-DW-06-1-07	-50	±	120	(200)
1689W0008	BY-DW-06-1-08	110	±	120	(200)
1689W0009	BY-DW-06-1-09	50	±	120	(200)
1689W0010	BY-DW-06-1-10	-60	±	110	(200)
1689W0011	BY-DW-06-1-11	40	±	110	(190)
1689W0012	BY-DW-06-1-12	60	±	110	(190)
1689W0013	BY-DW-06-1-13	30	±	110	(190)
1689W0014	BY-DW-06-1-14	70	±	110	(190)
1689W0015	BY-DW-06-1-15	0	±	110	(190)
1689W0016	BY-DW-06-1-16	-20	±	110	(190)
1689W0017	BY-DW-06-1-17	20	±	110	(190)
1689W0018	BY-DW-06-1-18	30	±	110	(190)
1689W0019	BY-DW-06-1-19	100	±	110	(190)
1689W0020	BY-DW-06-1-20	150	±	120	(190)
1689W0021	BY-DW-06-1-21	20	±	110	(190)

^aMDCs are in parenthesis.

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

^cZero values are due to rounding.