

ORISE

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

November 17, 2005

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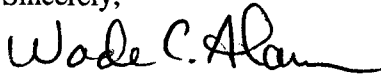
**SUBJECT: REVISED—IN-PROCESS INSPECTION SURVEY RESULTS FOR THE
TURBINE BUILDING EXCAVATION AT THE BIG ROCK POINT
RESTORATION PROJECT, CHARLEVOIX, MICHIGAN (DOCKET NO.
50-0155, RFTA NO. 05-012)**

Dear Mr. Shepherd:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) performed in-process inspection survey activities at the Turbine Building (TB) excavation at the Big Rock Point Restoration Project in Charlevoix, Michigan on September 20, 2005. These survey activities were requested and approved by the U.S. Nuclear Regulatory Commission (NRC). The survey activities included gamma surface scans and soil sampling. This letter report has been revised to clarify that the interlaboratory comparison samples were not part of the confirmatory activities of the TB excavation but were analyzed to fully assess the radioanalytical quality of the licensee's contractor laboratory. Enclosed are the in-process survey results documenting these survey activities.

If you have any questions or comments, please direct them to me at (865) 576-0065 or Scott Kirk at (865) 574-0685.

Sincerely,



Wade C. Adams
Health Physicist/Project Leader
Environmental Survey and
Site Assessment Program

WCA:ar

Enclosure

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**IN-PROCESS INSPECTION SURVEY RESULTS
FOR THE TURBINE BUILDING EXCAVATION
AT THE BIG ROCK POINT RESTORATION PROJECT
CHARLEVOIX, MICHIGAN**

INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) requested that the Oak Ridge Institute for Science and Education's (ORISE) Environmental Survey and Site Assessment Program (ESSAP) perform an in-process inspection survey of the Turbine Building (TB) excavation at the Big Rock Point Restoration Project (BRPRP) in Charlevoix, Michigan. The in-process inspection surveys were performed on September 20, 2005.

PROCEDURES

The in-process inspection surveys were performed in accordance with a site-specific survey plan that was submitted to and approved by the NRC (ORISE 2005a). The ORISE/ESSAP Survey Procedures and Quality Assurance Manuals were also followed (ORISE 2004 and 2005b).

Gamma surface scans were performed over 90% of accessible portions of the TB excavation using sodium iodide (NaI) scintillation detectors coupled to ratemeters with audible indicators. Soil samples collected from five locations within the TB excavation are indicated on Figure 1. The licensee provided three additional soil samples for comparison analyses. These samples were characterization samples selected from several locations on the site with varying degrees of activity needed to allow ESSAP to more fully assess the quality of the licensee's radioanalytical procedures. As such, these sample locations are not indicated on the figure and were not part of the confirmatory survey of the TB excavation.

SAMPLE ANALYSIS AND DATA INTERPRETATION

Radiological data and sample media were returned to ESSAP's laboratory in Oak Ridge, TN for analysis and interpretation. Radionuclide analyses were performed in accordance with the ESSAP Laboratory Procedures Manual (ORISE 2005c). Soil samples were analyzed by gamma spectroscopy for the primary radionuclides of interest (i.e., Co-60 and Cs-137). However, spectra were also reviewed for other gamma-emitting fission and activation products associated with the BRPRP and other identifiable total absorption peaks. The NRC requested additional tritium (H-3) analyses for the ESSAP-collected TB excavation soil samples. ESSAP did not perform Fe-55 or Sr-90 analyses on these samples as they were not major contributors to the dose. Soil sample results were reported in units of picocuries per gram (pCi/g).

FINDINGS AND RESULTS

Gamma surface scans did not identify any locations of elevated direct gamma radiation on the soil surfaces within the TB excavation. Three characterization samples that Consumers Energy Corporation (CEC) had analyzed at a contracted, off-site laboratory were also analyzed by ESSAP. The analytical results for the comparative evaluation of the CEC characterization samples are provided in Table 1 and indicated that the CEC contractor laboratory data, within the

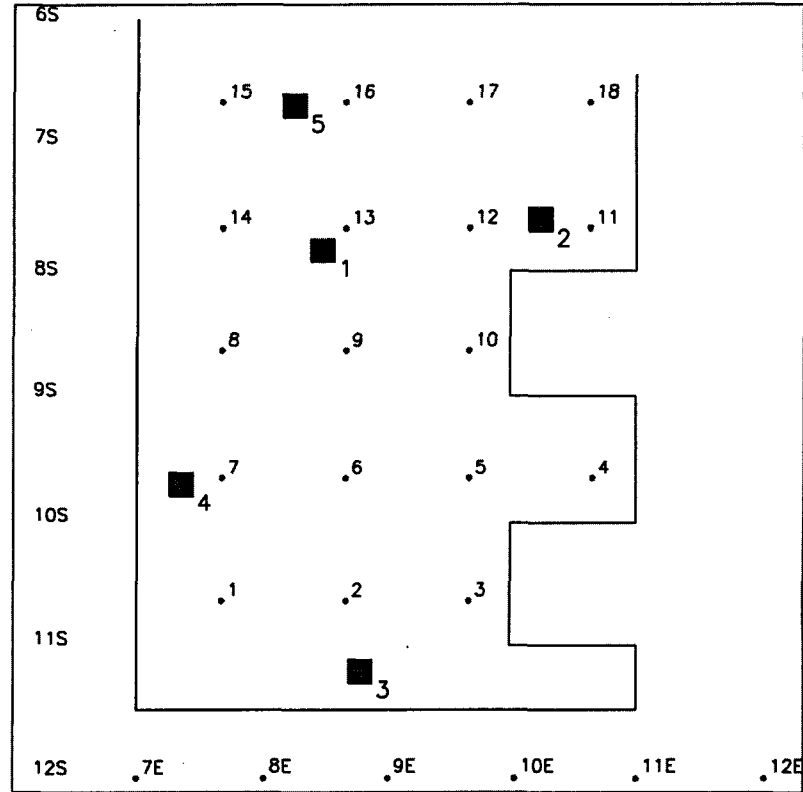
parameters of sample preparation and analytical procedures, were comparable with ESSAP's analytical results.

The range of radionuclide concentrations for the five confirmatory soil samples collected by ESSAP from the TB excavation are as follows:

Range of Radionuclide Concentrations in ESSAP-Collected Soil Samples (pCi/g)						
H-3	Mn-54	Co-60	Cs-137	Eu-152	Eu-154	Eu-155
-1.6 to 2.5	0.00 to 0.01	-0.01 to 0.02	0.00 to 0.01	-0.02 to 0.01	-0.01 to 0.01	0.00 to 0.04

All in-process confirmatory sample results were well within the respective derived concentration guideline levels (DCGLs) for the radionuclides-of-concern (ROC) as specified in the License Termination Plan [LTP (CEC 2004)]. The DCGL's are listed in Table 2 for each ROC. A complete listing of the ESSAP-collected confirmatory soil sample results is presented in Table 3.

The in-process confirmatory surveys did not detect any elevated residual activity through gamma surface scans or through soil sample analyses. Therefore, the results of these survey activities confirm that the radiological conditions of this survey unit are suitable for unrestricted use in accordance with the cleanup criteria cited in the licensee's LTP.



MEASUREMENT/SAMPLING
LOCATIONS

■ # SURFACE SOIL



FIGURE 1: Big Rock Point, Turbine Building Excavation – Soil Sampling Locations

TABLE 1

**ANALYTICAL COMPARISON OF CEC-COLLECTED SOIL SAMPLES
BIG ROCK POINT RESTORATION PROJECT
CHARLEVOIX, MICHIGAN**

Sample Identification ^a	Radionuclide Concentrations (pCi/g)			
	CEC Results ^b		ESSAP Results	
	Co-60	Cs-137	Co-60	Cs-137
ESSAP 1673S0006 CEC #1	0.29 ± 0.04	5.65 ± 0.12	0.34 ± 0.04 ^c	6.97 ± 0.24
ESSAP 1673S0007 CEC #2	0.95 ± 0.05	9.73 ± 0.12	1.05 ± 0.07	9.83 ± 0.33
ESSAP 1673S0008 CEC #3	15.28 ± 0.15	4.59 ± 0.08	22.88 ± 0.78	6.08 ± 0.26

^aESSAP sample numbers 6, 7 and 8 are CEC samples numbers 1, 2 and 3, respectively. These samples were used for interlaboratory analytical comparison and are not confirmatory samples from the TB excavation.

^bCEC contractor laboratory sample results were provided by CEC.

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

TABLE 2

**SUMMARY OF SOIL DCGLs
FROM TABLE 6-10 OF THE LICENSE TERMINATION PLAN
BIG ROCK POINT RESTORATION PROJECT
CHARLEVOIX, MICHIGAN**

Radionuclide	DCGL (pCi/g)
H-3	327
Mn-54	13.7
Fe-55	3.58 E+05
Co-60	3.21
Sr-90	2.48
Cs-137	13.2
Eu-152	7.35
Eu-154	6.78
Eu-155	287

TABLE 3

**RADIONUCLIDE CONCENTRATIONS
IN CONFIRMATORY SOIL SAMPLES
TURBINE BUILDING EXCAVATION
BIG ROCK POINT RESTORATION PROJECT
CHARLEVOIX, MICHIGAN**

Sample Identification ^a	Radionuclide Concentrations (pCi/g)						
	H-3	Mn-54	Co-60	Cs-137	Eu-152	Eu-154	Eu-155
1673S0001	2.5 ± 1.4 ^b	0.01 ± 0.02	-0.01 ± 0.02	0.01 ± 0.01	-0.02 ± 0.03	-0.01 ± 0.05	0.03 ± 0.03
1673S0002	-1.4 ± 1.3	0.00 ± 0.01 ^c	0.00 ± 0.02	0.01 ± 0.02	-0.01 ± 0.03	0.00 ± 0.07	0.00 ± 0.03
1673S0003	-1.6 ± 1.3	0.01 ± 0.01	0.02 ± 0.02	0.00 ± 0.01	-0.02 ± 0.03	-0.01 ± 0.06	0.04 ± 0.05
1673S0004	2.4 ± 1.4	0.00 ± 0.01	0.00 ± 0.02	0.01 ± 0.01	-0.01 ± 0.04	0.01 ± 0.07	0.00 ± 0.03
1673S0005	-0.8 ± 1.4	0.01 ± 0.01	0.02 ± 0.02	0.00 ± 0.01	0.01 ± 0.03	-0.01 ± 0.07	0.03 ± 0.03

^aRefer to Figure 1.

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

^cZero values are due to rounding.

REFERENCES

Consumers Energy Company (CEC). Big Rock Point Restoration Project, License Termination Plan Revision 1. Charlevoix, Michigan; July 1, 2004.

Oak Ridge Institute for Science and Education (ORISE). Survey Procedures Manual for the Environmental Survey and Site Assessment Program. Oak Ridge, Tennessee; September 2, 2004.

Oak Ridge Institute for Science and Education. In-Process/Confirmatory Survey Plan for the Open Land Area Survey Units, Big Rock Point Restoration Project, Charlevoix, Michigan [Docket No. 050-0155; RFTA No. 05-012]. Oak Ridge, Tennessee; September 15, 2005a.

Oak Ridge Institute for Science and Education. Quality Assurance Manual for the Environmental Survey and Site Assessment Program. Oak Ridge, Tennessee; July 29, 2005b.

Oak Ridge Institute for Science and Education. Laboratory Procedures Manual for the Environmental Survey and Site Assessment Program. Oak Ridge, Tennessee; June 20, 2005c.