STAFF EXHIBIT 5

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
U.S. ARMY	)	Docket No. 40-8838-MLA
	)	
(Jefferson Proving Ground Site)	)	

PREFILED TESTIMONY OF DALE CONDRA

Under penalty of perjury, I, Dale Condra, declare as follows: I attest that the factual statements herein are true and correct to the best of my knowledge, information, and belief; and the opinions expressed herein are based on my best professional judgment.

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U.S. NUCLEAR REGULATORY COMMISSION
In the Matter of U.S. Army (Jefferson Proving Ground)
Docket No. 40-8838-MLA Official Exhibit No. 5
OFFERED by: Applicant/Licensee Intervenor
NRC Staff Other
IDENTIFIED on Witness/Panel
Action Taken: ADMITTED REJECTED WITHDRAWN
Reporter/Clerk

DOCKETED
USNRC

October 25, 2007 (2:00pm)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Docket No. 40-8838-ML

SECY-02

TEMPLATE: SECY-055

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PREFILED TESTIMONY OF DALE CONDRA

Under penalty of perjury, I, Dale Condra, declare as follows: I attest that the factual statements herein are true and correct to the best of my knowledge, information, and belief; and the opinions expressed herein are based on my best professional judgment.

Q.1. Please state your name and employment.

A.1. Dale Condra. I am the laboratory manager for the Independent Environmental Assessment and Verification ("IEAV") program of the Oak Ridge Institute for Science and Education.

Q.2. What are your job duties and responsibilities as a laboratory manager?

A.2. My responsibilities include the day to day operation of the radiochemistry group of IEAV. This includes, but is not limited to the following:

(1) Maintaining an up-to-date laboratory procedure manual;

(2) Training and certification of the laboratory staff in the procedures in the laboratory manual;

(3) Proper instrumentation calibration;

(4) Review of the radioanalytical data generated by the laboratory staff including interpretation of quality control data;

(5) Review and interpretation of radioanalytical laboratory data received by the Health Physics Survey group;

(6) The generation of reports from radioanalytical data generated by the laboratory;

(7) Analyzing all of the radiological samples from the NRC; and

(8) Maintaining a 95% acceptance rate on performance evaluation samples associated with the Mixed Analyte Performance Evaluation Program required by the Department of Energy and the Intercomparison Test Program required by the NRC. Since the year 2000, the laboratory has maintained an acceptance rate of 98.9%. During this same time period, the acceptance rate for the analysis of isotopic uranium in various media has been 99.3%. The performance evaluation samples for isotopic uranium analysis have included natural uranium, depleted uranium, and enriched uranium.

Q.3. Please provide examples of your work performed as part of your job duties.

A.3. As part of my job duties, I am responsible for the review and approval of all calibrations associated with the counting instrumentation in the laboratory. I have the final responsibility of approving all radioanalytical data generated by the laboratory. I generate letter reports and associated analytical data tables for NRC inspectors from all four Regions. These letter reports have covered the analysis of air, soil, vegetation, water, and miscellaneous matrices, such as concrete and fish, with a wide variety of possible contamination from radioactive materials. These letter reports are the final step in the radioanalytical process which can include non-destructive and destructive analysis and data evaluation. As examples of my current work, I have reviewed data and/or analyzed samples from the Braidwood, Illinois Nuclear Generating Station, the Indian Point Power Station in Buchanan, New York, and the Shieldalloy site in New Jersey.

Q.4. Please describe your professional qualifications including education, training, work experience, and publications.

A.4. I have a bachelors' degree in chemistry from Middle Tennessee State University. I have worked in radiochemistry since February of 1973. I was officially promoted to the position of laboratory manager in October 1999. In addition to my laboratory manager's duties, I have assisted the DOE laboratory auditing group (presently the DOE Consolidated Audit Program) as a lead auditor in the area of radiochemistry. A copy of my C.V. is attached.

Q.5. Please describe your involvement and responsibilities regarding the Staff's review of the Jefferson Proving Ground application.

A.5. I have reviewed and am familiar with the technical issues pertaining to uranium concentrations in deer tissues at Jefferson Proving Ground ("JPG"). I have also reviewed and am familiar with the technical issues raised by Save the Valley, Inc. ("STV") in Mr. Norris' testimony regarding sample collection and analysis methods. After reviewing the relevant data and analyses, I have drawn conclusions regarding the uranium concentrations in the deer tissues, and Mr. Norris' testimony regarding sample collection and analysis methods.

Q.6. Did you review or rely on any specific documents to prepare for or conduct your analysis?

A.6. In addition to the STV's prefiled testimonies of Dr. Henshel and Mr. Norris, I have reviewed the following items during the preparation of this testimony:

(1) Multi-Agency Radiological Laboratory Analytical Protocols Manual (NUREG-1576) (ML060930645, ML060930657, ML060930662) ("MARLAP");

(2) Hess, C.T., J. Michel, T.R. Horton, H.M. Prichard, and W.A. Coniglio. The Occurrence of Radioactivity in Public Water Supplies in the United States. Health Physics, Volume 48, Number 5, May 1985;

(3) WHO 2004: Guidelines for drinking-water quality, third edition, Chapter 9, Radiological Aspects, pages 197-209 http://www.who.int/water_sanitation_health/dwq/gdwq3rev/en/index.html

(4) United Nations Scientific Committee on the Effects of Atomic Radiation. Source and Effects of Ionizing Radiation. Report to the General Assembly, with scientific annexes. United Nations Publications. New York, New York; 2000 ("UNSCEAR");

(5) ASTM D 3972-02, Standard Test Method for Isotopic Uranium in Water by Radiochemistry; http://www.astm.org;

(6) Field Sampling Plan -- Depleted Uranium Impact Area Site Characterization Jefferson Proving Ground, Madison, Indiana --Final, Prepared for: U.S. Department of Army, May 2005 (ML051520319) ("FSP"); and

(7) Deer Tissue Sampling Results: Depleted Uranium Impact Area Site Characterization, Jefferson Proving Ground, Madison, Indiana; Final; SAIC August 2006 (ML062210019) ("SAIC 2006").

Q.7. Please describe your analysis and state your conclusions for uranium concentrations in deer tissues at Jefferson Proving Ground.

A.7. The range of average total uranium concentrations in deer muscle tissue at JPG is 0.008 to 0.013 pCi/g. In addition, the highest U-238/U-234 ratio was 1.5, but the total uranium concentration for the sample was at background levels. The concentrations of U-234 in the deer tissue are consistently greater than the U-238 concentrations, meaning the ratio is less than 1. The U-238/U-234 ratios in the deer tissue appear to be similar the U-238/U-234 ratios in the water samples. I see no evidence that would lead anyone to conclude that DU has been detected in the deer tissue samples. It is reasonable to conclude that if a sample yielded a total uranium concentration greater than what would be expected in background or at some predefined action level, then the sample should be evaluated to determine whether the activity is due to DU or natural uranium (as required by license condition, site procedures, or the FSP). However, in the absence of evidence that the total uranium concentrations exceed what is expected in background, there would be no additional benefit or requirement to submit the sample for further analysis or evaluation.

It is also reasonable to assume that if total uranium concentrations in environmental media are at expected background levels, then the levels of uranium in a receptor organism (e.g., deer) would not exceed expected background concentrations (given that environmental uranium is the source of uptake for biota). Therefore, given that no anomalies were identified in the existing deer tissue data for the 30 deer harvested for the sampling effort described in the SAIC 2006 report, and that the observed total uranium concentrations in the samples appear to approximate background, it is not reasonable and is unnecessary to request that additional deer be harvested expressly for uranium analysis purposes. SAIC 2006, pages 35-46.

STV's questioning of the duplicate data shows that STV does not take into account the uncertainties associated with the measurement. A valid interpretation of radioanalytical data takes into account total uncertainties associated with the measurements. The laboratory Quality Control Chapter (18) in MARLAP provides guidance for the proper evaluation of laboratory control samples, duplicates, matrix spikes, and matrix spike duplicates. All of the examples in this chapter take into account uncertainties. While the concentrations of the duplicates may not be statistically equal, there is no indication that the concentrations represent anything more than background data.

Q.8. Can you form an overall conclusion as to the analysis of deer samples for uranium regarding the JPG site?

A.8. Yes, based on my experience and education and as supported by my analysis above, I conclude that the isotopic uranium data I have reviewed are consistent with background levels and does not indicate that DU has been detected in the samples that were collected as part of the project. Therefore, with respect to this issue, the FSP is adequate to provide the necessary information regarding deer sample analysis.

Rebuttal to STV's Prefiled Testimony of Mr. Norris

Q.9. Please describe your analysis of Mr. Norris' testimony on sample collection and analysis.

A.9. Page 2-14 of the FSP states that the FSP will provide data to address two key issues:

1) Limited understanding of the present nature and extent of contamination in the Depleted Uranium (DU) Impact Area and

2) Limited understanding of the potential fate and transport of DU outside the DU Impact Area.

The objective of addressing these two issues is to serve as a basis to modify the current Environmental Radiation Monitoring ("ERM") Program "within the next 2 to 3 years with a longer-term goal of establishing the foundation to initiate decommissioning in October 2010". FSP at 2-14. However, the interveners take exception to issue 2) above, and are challenging the methods needed to determine whether or not DU has migrated outside of the DU impact Area.

Assuming as Mr. Norris did, that the analysis methods to be used for the FSP are consistent with those used for the data presented in the Radiation Monitoring Reports for sampling events in April 10-13, 2006 (per the requirements of the ERM Program), I believe that the analysis methods provide an adequate level of sensitivity to determine if the levels of uranium in surface water, groundwater, and soil/sediment are consistent with the typical ranges of background concentrations in the United States and at JPG (refer to Table 2-1 of the FSP). This statement is supported by the scientific literature I have reviewed.

A summary of typical environmental concentrations of uranium cited in the referenced scientific literature is presented below. Note that the units have been converted to allow for a direct comparison to the JPG data.

Media	Isotope	Typical Average Environmental Concentrations	Units	Reference
Soil	U-238	1 (0.1 to 4)	pCi/g	UNSCEAR 2000
Surface Water	Total Uranium	0.75[a]	pCi/L	Hess, et. al., 1985
Groundwater	Total Uranium	0.75[a]	pCi/L	Hess, et. al., 1985

[a] Data represents population-averaged U concentration for state of Indiana

The background soil sample data collected from non-impacted areas of the JPG indicates that the ranges of total uranium concentrations in soil (1.42 to 1.87 pCi/g), surface water (0.35 to 0.88 pCi/L), and groundwater (0.43 to 3.6 pCi/L) (based on scoping survey results from trajectory locations as presented in the FSP Table 2-1) are consistent with the population-averaged uranium concentrations presented in the Table above. In addition, uranium concentration in surface water and ground water can vary from 0.01 µg/L to 1500 µg/L (WHO 2004). Using a 1:1 ratio (µg/L to pCi/L) based on EPA regulations 40 C.F.R. Parts 141, and 142, uranium concentrations in surface water and ground water would vary from 0.01 pCi/L to 1500 pCi/L. 65 FR 76712 - 76713. This EPA rule also states that the maximum uranium concentration in drinking water should be 30 pCi/L. 40 C.F.R. 141.66(e).

Mr. Norris implied in his answer to question 67 that high uncertainties for analytical results is a manifestation of inadequate field and analytical protocols. The uncertainty is driven by statistical limitations of the science of radiation detection, and is not a consequence of inadequate protocols. Note that I have reviewed the reported uncertainties, and I believe the uncertainties to be very reasonable for the type of analysis and uranium concentrations in the samples.

In Norris Answer no. 73, Mr Norris states.

> Had a sample of the specified size been analyzed, the count rates would have been substantially higher (approximately 9-fold) and

> the uncertainties substantially lower. In this case, unnecessarily low count rates, due to small sample size, produced uncertainties that allowed the Army to reject the indication of DU in the sample.

The uncertainty to a large extent is driven by the amount of activity in the sample. If there is activity in a specific media, a larger sample size can help generate a smaller uncertainty. However, this is true only to a certain point in the case of uranium isotopes. The mass of U-238 on a counting plate can actually lead to spectral degradation by attenuation of the alpha emissions. Selecting the appropriate aliquot size is crucial for analysis in order to assure that all aspects of the Data Quality Objectives are met.

In Norris Answer no. 75, Mr. Norris states, "With respect to isotope analyses, sampling and laboratory protocols should be established that will allow the identification and quantification of DU at levels that constitute 25% or more of the total uranium in the sample of any particular medium." In my laboratory, the only method used to determine the isotopic ratio of U-238/U-234 is a statistical method of dividing the U-238 concentration by the U-234 concentration and then propagating the uncertainties. I am not aware of a methodology that permits one to determine if part of a sample is natural uranium or DU. The concentrations in the analyzed aliquot are reported in either natural uranium or DU. I have never observed uranium concentrations reported in any sample as a percentage of natural uranium and a percentage of DU. Mr. Norris also states "Alternatively, the FSP could be rewritten to establish the isotope concentrations using chemical rather than, or in addition to, radiological methods." Alpha spectroscopy, which includes the chemical separation of uranium from interfering isotopes, continues to be an accepted methodology for isotopic identification and quantification of uranium and DU.

Q.10. Can you form an overall conclusion as to the analysis methods Mr. Norris assumes will be used in the FSP for determining uranium levels in samples?

A.10. Yes, based on my experience and education and as supported by my analysis above, I conclude that the FSP is adequate to provide the necessary level of sensitivity to determine the levels of uranium in surface water, groundwater, and soil/sediment.

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PREFILED TESTIMONY OF DALE CONDRA

I, Dale Condra, do declare under penalty of perjury that my statements in the foregoing testimony and my attached statement of professional qualifications are true and correct to the best of my knowledge and belief.

Dale Condra

Executed at Oak Ridge, TN
This 16th day of August, 2007.

C.V.

ROGER DALE CONDRA

[redacted]

Phone: [redacted]

EDUCATION

B.A., Chemistry; Middle Tennessee State University, Murfreesboro, Tennessee, 1970.

Short Courses:

1973 - EPA Radiation Quality Assurance Symposium
1973 - AEC Radiochemistry Analyses, Montgomery, AL
1974 - EPA Sampling Standardization, Raleigh, NC
1974 - EPA Sequential Analysis Ra-226, 228, Columbia, SC
1975 - Nuclear Data, 4420 Systems Operation, Chicago, IL
1980 - INEL Radiochemistry Analyses, Idaho Falls, ID
1982 - Packard Liquid Scintillation Course, Chicago, IL
1997 - DOE Auditor Training

WORK EXPERIENCE

August 1970-January 1973:	Chemistry Teacher, Whitwell, TN
February 1973-November 1978:	Tennessee Department of Public Health, Nashville, TN, Radiochemist
December 1978-March 1979:	TVA, Vonore, TN, Radiochemist, Laboratory Supervisor
April 1979-May 1981:	Tennessee Department of Public Health, Nashville, TN, Radiochemist
June 1981-November 1988:	Oak Ridge Associated Universities, Radiological Site Assessment Program, Oak Ridge, TN, Radiochemist/Laboratory Supervisor
December 1988-March 1990:	IT Corporation, Oak Ridge, TN, Radiochemist
April 1990-Present:	Oak Ridge Associated Universities, IEAV, Oak Ridge, TN, Counting Room Supervisor and Laboratory Manager

Publication:

Determination of Uranium and Thorium Concentrations in High-Z Material Samples Using Direct Counting Method of Gamma Spectroscopy, Radiation Protection Management, Volume 13, No.1 (January/February), pp. 42-49, Abelquist, Condra, and Laudeman