



## Department of Energy

Ohio Field Office  
 Fernald Closure Project  
 175 Tri-County Parkway  
 Springdale, Ohio 45246  
 (513) 648-3155



MAR 07 2006

Mr. James A. Saric, Remedial Project Manager  
 United States Environmental Protection Agency  
 Region V, SR-6J  
 77 West Jackson Boulevard  
 Chicago, Illinois 60604-3590

DOE-0082-06

Mr. Tom Schneider, Project Manager  
 Ohio Environmental Protection Agency  
 Southwest District Office  
 401 East 5<sup>th</sup> Street  
 Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

**TRANSMITTAL OF AMENDED ANALYTICAL AND STATISTICAL DATA FOR THE FINAL CERTIFICATION REPORT FOR AREA 2, PHASE II - SUBAREA 3 EQUIPMENT WASH FACILITY, SUBCONTRACTOR LAYDOWN AREA, TRAILER COMPLEX AREA, AND AQUIFER PROJECT LAYDOWN AREA**

Enclosed for your record is the amended analytical and statistical data contained in Appendix A of the Certification Report for the Area 2, Phase II (A2PII) - Subarea 3 Equipment Wash Facility, Subcontractor Laydown Area, Trailer Complex Area, and Aquifer Project Laydown Area. This data represents a modification of the tables that were presented for Certification Units (CUs) 4 and 5 of the Trailer Complex Area.

During the validation process for another characterization task, it was found that some of the radiological data reported by General Engineering Laboratories of Ohio (GEL-Ohio) had been quantified and reported utilizing a calibration that exceeded the annual verification. The laboratory was immediately notified by Fluor Fernald Inc. on or about January 26, 2006, and Fluor Fernald received a nonconformance notification from GEL-Ohio. This notification indicated that although they had performed the required yearly calibration/verification, the software loaded on one of the detectors contained an error that prevented this new calibration from being saved thus defaulting to the expired calibration.

Upon review of all packages potentially impacted by this, it was determined that the instrument in question was used to analyze two releases from this A2PII certification effort representing some of the data from two separate CUs (TCA 4 and TCA 5).

Initially, it was determined that the difference between the older and newer calibration was of minimal impact and would not have a negative impact on the certification data for the following reasons:

- The two calibrations were not significantly different and this difference was within the known uncertainty of the analytical method being used.
- Consistent with all Analytical Support Level D analyses, the samples from CUs TCA-C4 and TCA-C5 which had data quantified based on the old calibration were also analyzed and quantified with a laboratory control standard which was an independently verified standard of known value and was treated in the same manner as the samples. The results of analysis for the laboratory control standard were within acceptable parameters indicating that the sample results were also within acceptable parameters. The use of an independent laboratory control standard is routinely done in laboratory environments to re-certify expired standards.

However, to be conservative, the laboratory was directed to reprocess the "raw" analytical data using the new calibration. In this process the unedited, unprocessed, or "raw" data that was originally quantified utilizing the outdated calibration was re-quantified using the current calibration. This produced analytical results that more closely reflect the Fernald Closure Project's contractual requirements for laboratories and as expected vary only slightly from the data that were originally reported. As can be seen in the attached information, the following conclusions can be drawn.

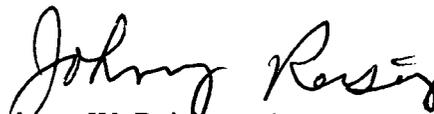
- For CU4 - Radium-228, thorium-228, thorium-232, and total uranium had no results exceeding the final remediation level (FRL). Therefore, there was no impact to the certification effort and does not change the original certification decision.
- For CU4 - Radium-226 had one analytical result in excess of the FRL. However, as shown in the statistical evaluation of the data, the reprocessed data did not significantly alter the statistical data associated with this certification effort as the reprocessed upper confidence level (UCL) on the mean is 1.49 as compared to the original reported UCL on the mean of 1.48. Therefore, there was no impact to the certification effort and does not change the original certification decision.
- For CU5 - Radium-226, radium-228, thorium-228, thorium-232, and total uranium had no results exceeding the FRL. Therefore, there was no impact to the certification effort and does not change the original certification decision.

As stated above, the laboratory issued a non-conformance to document and correct the issue with the improper calibration being applied to the analytical data. In that document, the laboratory commits to a more careful review of generated data to prevent this from reoccurring. Moreover, since the annual calibration was performed in June 2005, the current calibration will be in use through the majority of the remaining project existence so there is little likelihood of this situation reoccurring.

In summary, although data was originally reported using a calibration that had exceeded the date of its annual calibration verification, the reprocessed data was not significantly changed and subsequent statistical evaluation shows minimal alteration. It is, therefore, concluded that the modification has no effect on the certification status of the two CUs impacted. The enclosed change pages represent a replacement to the statistical analysis of CUs TCA-C4 and TCA-C5 (Pages A-8 and A-9 of Appendix A).

If you have any questions regarding this transmittal, please contact me at (513) 648-3139.

Sincerely,



Johnny W. Reising  
Director

Enclosure

cc w/enclosures:

J. Desormeau, OH/FCP  
T. Schneider, OEPA-Dayton (three copies of enclosures)  
G. Jablonowski, USEPA-V, SR-6J  
M. Cullerton, Tetra Tech  
M. Shupe, HSI GeoTrans  
R. Vandegrift, ODH  
AR Coordinator, Fluor Fernald, Inc./MS6

cc w/o enclosures:

J. Chiou, Fluor Fernald, Inc./MS88  
F. Johnston, Fluor Fernald, Inc./MS12  
C. Murphy, Fluor Fernald, Inc./MS1

Fluor Fernald, Inc.  
P.O. Box 538704  
Cincinnati, OH 45253-8704

# FLUOR

February 28, 2006

Fernald Closure Project  
Letter No. C:CPD:2006-0048

Mr. Johnny W. Reising, Director  
U. S. Department of Energy  
Ohio Field Office - Fernald Closure Project  
175 Tri-County Parkway  
Cincinnati, Ohio 45246

Dear Mr. Reising:

**CONTRACT DE-AC24-01OH20115, TRANSMITTAL OF AMENDED ANALYTICAL AND STATISTICAL DATA FOR THE FINAL CERTIFICATION REPORT FOR AREA 2, PHASE II - SUBAREA 3 EQUIPMENT WASH FACILITY, SUBCONTRACTOR LAYDOWN AREA, TRAILER COMPLEX AREA, AND AQUIFER PROJECT LAYDOWN AREA**

Enclosed for your record is the amended analytical and statistical data contained in Appendix A of the Certification Report for the Area 2, Phase II (A2Pll) - Subarea 3 Equipment Wash Facility, Subcontractor Laydown Area, Trailer Complex Area, and Aquifer Project Laydown Area. This data represents a modification of the tables that were presented for Certification Units (CUs) 4 and 5 of the Trailer Complex Area.

During the validation process for another characterization task, it was found that some of the radiological data reported by General Engineering Laboratories of Ohio (GEL-Ohio) had been quantified and reported utilizing a calibration that exceeded the annual verification. The laboratory was immediately notified by Fluor Fernald Inc. on or about January 26, 2006, and Fluor Fernald received a nonconformance notification from GEL-Ohio. This notification indicated that although they had performed the required yearly calibration/verification, the software loaded on one of the detectors contained an error that prevented this new calibration from being saved thus defaulting to the expired calibration.

Upon review of all packages potentially impacted by this, it was determined that the instrument in question was used to analyze two releases from this A2Pll certification effort representing some of the data from two separate CUs (TCA 4 and TCA 5).

Initially, it was determined that the difference between the older and newer calibration was of minimal impact and would not have a negative impact on the certification data for the following reasons:

Mr. Johnny W. Reising, Director  
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- The two calibrations were not significantly different and this difference was within the known uncertainty of the analytical method being used.
- Consistent with all Analytical Support Level D analyses, the samples from CUs TCA-C4 and TCA-C5 which had data quantified based on the old calibration were also analyzed and quantified with a laboratory control standard which was an independently verified standard of known value and was treated in the same manner as the samples. The results of analysis for the laboratory control standard were within acceptable parameters indicating that the sample results were also within acceptable parameters. The use of an independent laboratory control standard is routinely done in laboratory environments to re-certify expired standards.

However, to be conservative, the laboratory was directed to reprocess the "raw" analytical data using the new calibration. In this process the unedited, unprocessed, or "raw" data that was originally quantified utilizing the outdated calibration was re-quantified using the current calibration. This produced analytical results that more closely reflect the Fernald Closure Project's contractual requirements for laboratories and as expected vary only slightly from the data that were originally reported. As can be seen in the attached information, the following conclusions can be drawn.

- For CU4 - Radium-228, thorium-228, thorium-232, and total uranium had no results exceeding the final remediation level (FRL). Therefore, there was no impact to the certification effort and does not change the original certification decision.
- For CU4 - Radium-226 had one analytical result in excess of the FRL. However, as shown in the statistical evaluation of the data, the reprocessed data did not significantly alter the statistical data associated with this certification effort as the reprocessed upper confidence level (UCL) on the mean is 1.49 as compared to the original reported UCL on the mean of 1.48. Therefore, there was no impact to the certification effort and does not change the original certification decision.
- For CU5 - Radium-226, radium-228, thorium-228, thorium-232, and total uranium had no results exceeding the FRL. Therefore, there was no impact to the certification effort and does not change the original certification decision.

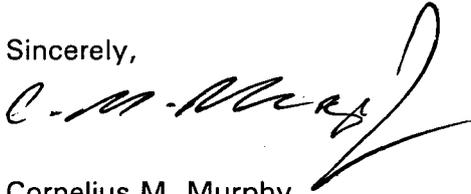
As stated above, the laboratory issued a non-conformance to document and correct the issue with the improper calibration being applied to the analytical data. In that document, the laboratory commits to a more careful review of generated data to prevent this from reoccurring. Moreover, since the annual calibration was performed in June 2005, the current calibration will be in use through the majority of the remaining project existence so there is little likelihood of this situation reoccurring.

In summary, although data was originally reported using a calibration that had exceeded the date of its annual calibration verification, the reprocessed data was not significantly changed and subsequent statistical evaluation shows minimal alteration. It is, therefore, concluded that the modification has no effect on the certification status of the two CUs impacted. The enclosed change pages represent a replacement to the statistical analysis of CUs TCA-C4 and TCA-C5 (Pages A-8 and A-9 of Appendix A).

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Upon your concurrence, please forward this information to the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency. If you have any questions or require additional information, please contact Jyh-Dong Chiou at (513) 738-2834 or Frank Miller at (513) 484-2324.

Sincerely,



Cornelius M. Murphy  
Closure Project Director

CMM:FLM:jkp

Enclosures

c: With Enclosures

Debbie Brennan, MS88  
Joe Desormeau, DOE-OH/FCP, MS2  
Reinhard Friske, MS60  
Frank L. Miller, MS88  
SDFP Library, MS88  
DOE Records Center  
Administrative Record, MS6  
Letter Log Copy, MS1  
Project Number 20450.2.22 (20450-RP-0010)

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c: Without Enclosures

Richard Abitz, MS88  
Tom Buhrlage, MS60-1  
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Christina Carr, DOE-OH/FCP, MS2  
Tom Carr, MS64  
Jyh-Dong Chiou, MS88  
Mike Connors, MS99  
Dennis Dalga, MS52-3  
Timothy L. Jones, DOE Contracting Officer, DOE/EMCBC  
Uday Kumthekar, MS88  
Gregg Johnson, MS60  
Frank Johnston, MS12  
Jeff Middaugh, MS60  
Dennis Nixon, MS1  
Scott Osborn, MS52-3  
M. D. Powell, MS64  
Dennis Sizemore, Fluor Fernald, Inc. Prime Contract, MS1  
Anthony Snider, MS88  
Chuck Van Arsdale, MS88  
Fred Wilson, MS64  
Bill Zebick, MS60

**REPROCESSED DATA INFORMATION FOR CUS 4 AND 5 OF THE TRAILER COMPLEX AREA**

SAMPLE ID	PRIMARY COCs								
	Radium-226			Radium-228			Thorium-228		
	original	reprocessed	% difference	original	reprocessed	% difference	original	reprocessed	% difference
TCA-C4-05^1-R	1.22 -	1.25 -	2.4	0.934 J	0.967 J	3.4	0.932 J	0.964 J	3.3
TCA-C4-07^1-R	0.710 -	0.727 -	2.3	0.562 J	0.573 J	1.9	0.548 J	0.559 J	2
TCA-C4-08^1-R	1.17 -	1.20 -	2.5	0.914 J	0.938 J	2.6	0.868 J	0.900 J	3.6
TCA-C4-12^1-R	1.39 -	1.40 -	0.7	1.02 J	1.04 J	1.9	1.01 J	1.03 J	1.9
TCA-C4-13^1-R	1.36 J	1.38 J	1.4	1.14 J	1.17 J	2.6	1.15 J	1.18 J	2.5
TCA-C4-14^1-R	1.36 -	1.39 -	2.2	0.933 J	0.975 J	4.3	0.971 J	1.01 J	3.9
TCA-C4-16^1-R	0.968 -	0.988 -	2	0.629 J	0.654 J	3.8	0.668 J	0.688 J	2.9
TCA-C4-16^1-R-D	1.07 -	1.11 -	3.6	0.596 J	0.613 J	2.8	0.626 J	0.638 J	1.9
TCA-C5-01^1-R	1.27 -	1.30 -	2.3	0.892 J	0.916 J	2.6	0.881 J	0.904 J	2.5
TCA-C5-03^1-R	1.19 -	1.22 -	2.5	0.922 J	0.952 J	3.2	0.954 J	0.977 J	2.4
TCA-C5-04^1-R	0.946 J	0.966 J	2.1	0.598 J	0.612 J	2.3	0.608 J	0.619 J	1.8

SAMPLE ID	PRIMARY COCs					
	Thorium-232			Uranium, Total		
	original	reprocessed	% difference	original	reprocessed	% difference
TCA-C4-05^1-R	0.934 J	0.967 J	3.4	5.57 -	5.59 -	0.4
TCA-C4-07^1-R	0.562 J	0.573 J	1.9	5.24 J	5.23 J	0.2
TCA-C4-08^1-R	0.914 J	0.938 J	2.6	3.28 U	3.30 U	0
TCA-C4-12^1-R	1.02 J	1.04 J	1.9	10.6 -	10.6 -	0
TCA-C4-13^1-R	1.14 J	1.17 J	2.6	15.6 -	15.6 -	0
TCA-C4-14^1-R	0.933 J	0.975 J	4.3	12.3 -	12.3 -	0
TCA-C4-16^1-R	0.629 J	0.654 J	3.8	5.45 J	5.47 J	0.4
TCA-C4-16^1-R-D	0.596 J	0.613 J	2.8	5.91 J	5.94 J	0.5
TCA-C5-01^1-R	0.892 J	0.916 J	2.6	5.72 J	5.75 J	0.5
TCA-C5-03^1-R	0.922 J	0.952 J	3.2	13.5 -	13.5 -	0
TCA-C5-04^1-R	0.598 J	0.612 J	2.3	4.79 J	4.81 J	0.4

APPENDIX A

ORIGINAL STATISTICAL ANALYSIS OF TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 4

SAMPLE ID	PRIMARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
TCA-C4-02^1-R	1.67 -	1.08 J	1.12 J	1.08 J	4.78 J
TCA-C4-03^1-R	1.76 -	1.43 J	1.42 J	1.43 J	7.24 -
TCA-C4-04^1-R	1.34 -	1.05 J	1.03 J	1.05 J	3.93 U
<i>TCA-C4-05^1-R</i>	<i>1.22 -</i>	<i>0.934 J</i>	<i>0.932 J</i>	<i>0.934 J</i>	<i>5.57 -</i>
<i>TCA-C4-07^1-R</i>	<i>0.710 -</i>	<i>0.562 J</i>	<i>0.548 J</i>	<i>0.562 J</i>	<i>5.24 J</i>
<i>TCA-C4-08^1-R</i>	<i>1.17 -</i>	<i>0.914 J</i>	<i>0.868 J</i>	<i>0.914 J</i>	<i>3.28 U</i>
<i>TCA-C4-09^1-R</i>	<i>1.53 -</i>	<i>1.28 J</i>	<i>1.29 J</i>	<i>1.28 J</i>	<i>10.7 -</i>
TCA-C4-10^1-R	1.42 -	1.07 J	1.04 J	1.07 J	11.7 -
<i>TCA-C4-12^1-R</i>	<i>1.39 -</i>	<i>1.02 J</i>	<i>1.01 J</i>	<i>1.02 J</i>	<i>10.6 -</i>
<i>TCA-C4-13^1-R</i>	<i>1.36 J</i>	<i>1.14 J</i>	<i>1.15 J</i>	<i>1.14 J</i>	<i>15.6 -</i>
<i>TCA-C4-14^1-R</i>	<i>1.36 -</i>	<i>0.933 J</i>	<i>0.971 J</i>	<i>0.933 J</i>	<i>12.3 -</i>
<i>TCA-C4-16^1-R</i>	<i>0.968 -</i>	<i>0.629 J</i>	<i>0.668 J</i>	<i>0.629 J</i>	<i>5.45 J</i>
<i>TCA-C4-16^1-R-D</i>	<i>1.07 -</i>	<i>0.596 J</i>	<i>0.626 J</i>	<i>0.596 J</i>	<i>5.91 J</i>
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.76	1.43	1.42	1.43	15.6
Max. >= Limit	Yes	No	No	No	No
W-statistic Prob. #	59.2% (N)	--	--	--	--
Test Procedure	Normal	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	2
% Nondetects	0%	0%	0%	0%	17%
Est. Mean*	1.33	--	--	--	--
UCL	<i>1.48</i>	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	pass	--	--	--	--
<i>a posteriori Sample</i>	5	--	--	--	--
Size calculation	Pass	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.

The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

Note 2: Results that are affected by the reprocessing of the data are in bold italics

APPENDIX A

ORIGINAL STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 5

SAMPLE ID	PRIMARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
<i>TCA-C5-01^1-R</i>	<i>1.27 -</i>	<i>0.892 J</i>	<i>0.881 J</i>	<i>0.892 J</i>	<i>5.72 J</i>
<i>TCA-C5-03^1-R</i>	<i>1.19 -</i>	<i>0.922 J</i>	<i>0.954 J</i>	<i>0.922 J</i>	<i>13.5 -</i>
<i>TCA-C5-04^1-R</i>	<i>0.946 J</i>	<i>0.598 J</i>	<i>0.608 J</i>	<i>0.598 J</i>	<i>4.79 J</i>
TCA-C5-06^1-R	1.22 -	1.05 J	1.07 J	1.05 J	13.5 -
TCA-C5-06^1-R-D	1.12 -	0.851 J	0.848 J	0.851 J	12.0 -
TCA-C5-07^1-R	1.23 -	0.956 J	0.977 J	0.956 J	12.6 -
TCA-C5-08^1-R	1.21 -	0.854 J	0.873 J	0.854 J	10.4 J
TCA-C5-09^1-R	1.15 J	0.686 J	0.683 J	0.686 J	8.30 -
TCA-C5-10^1-R	0.956 -	0.651 J	0.672 J	0.651 J	15.8 -
TCA-C5-12^1-R	1.23 -	0.914 J	0.955 J	0.914 J	13.3 -
TCA-C5-13^1-R	1.26 -	0.970 J	0.959 J	0.970 J	12.5 -
TCA-C5-14^1-R	1.21 -	0.886 J	0.872 J	0.886 J	10.7 -
TCA-C5-16^1-R	1.26 -	0.812 J	0.818 J	0.812 J	16.5 -
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.27	1.05	1.07	1.05	16.5
Max. >= Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	0
% Nondetects	0%	0%	0%	0%	0%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori Sample</i>	--	--	--	--	--
Size calculation	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.

The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

Note 2: Results that are affected by the reprocessing of the data are in bold italics

**REPLACEMENT PAGES A-7 THROUGH A-10  
TO BE INSERTED INTO APPENDIX A**

**(Pages A-7 and A-10 are only included  
for reproduction purposes)**

**APPENDIX A**  
**STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 3**

SAMPLE ID	PRIMARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
TCA-C3-01	0.910 -	0.611 -	0.604 -	0.611 -	4.03 J
TCA-C3-03	0.802 -	0.686 -	0.679 -	0.686 -	6.31 J
TCA-C3-04	1.04 -	0.809 -	0.814 -	0.809 -	10.3 -
TCA-C3-05	1.11 -	0.805 -	0.807 -	0.805 -	4.95 J
TCA-C3-05-D	1.10 -	0.886 -	0.899 -	0.886 -	8.33 -
TCA-C3-06	1.13 -	0.997 -	0.993 -	0.997 -	8.96 -
TCA-C3-08	1.23 -	0.988 -	0.981 -	0.988 -	7.06 -
TCA-C3-10	1.32 -	1.06 -	1.07 -	1.06 -	6.12 -
TCA-C3-11	1.17 -	0.896 -	0.927 -	0.896 -	3.15 U
TCA-C3-12	1.46 -	1.16 -	1.17 -	1.16 -	6.64 -
TCA-C3-13	1.46 -	1.16 -	1.18 -	1.16 -	9.56 -
TCA-C3-15	1.33 -	1.03 -	1.02 -	1.03 -	8.35 -
TCA-C3-16	1.10 -	0.946 -	0.956 -	0.946 -	6.16 -
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.46	1.16	1.18	1.16	10.3
Max. >= Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	1
% Nondetects	0%	0%	0%	0%	8%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.

The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A

REPROCESSED STATISTICAL ANALYSIS OF TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 4

SAMPLE ID	PRIMARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
TCA-C4-02^1-R	1.67 -	1.08 J	1.12 J	1.08 J	4.78 J
TCA-C4-03^1-R	1.76 -	1.43 J	1.42 J	1.43 J	7.24 -
TCA-C4-04^1-R	1.34 -	1.05 J	1.03 J	1.05 J	3.93 U
<i>TCA-C4-05^1-R</i>	<i>1.25 -</i>	<i>0.967 J</i>	<i>0.964 J</i>	<i>0.967 J</i>	<i>5.59 -</i>
<i>TCA-C4-07^1-R</i>	<i>0.727 -</i>	<i>0.573 J</i>	<i>0.559 J</i>	<i>0.573 J</i>	<i>5.23 J</i>
<i>TCA-C4-08^1-R</i>	<i>1.20 -</i>	<i>0.938 J</i>	<i>0.900 J</i>	<i>0.938 J</i>	<i>3.30 U</i>
<i>TCA-C4-09^1-R</i>	<i>1.53 -</i>	<i>1.28 J</i>	<i>1.29 J</i>	<i>1.28 J</i>	<i>10.7 -</i>
TCA-C4-10^1-R	1.42 -	1.07 J	1.04 J	1.07 J	11.7 -
<i>TCA-C4-12^1-R</i>	<i>1.40 -</i>	<i>1.04 J</i>	<i>1.03 J</i>	<i>1.04 J</i>	<i>10.6 -</i>
<i>TCA-C4-13^1-R</i>	<i>1.38 J</i>	<i>1.17 J</i>	<i>1.18 J</i>	<i>1.17 J</i>	<i>15.6 -</i>
<i>TCA-C4-14^1-R</i>	<i>1.39 -</i>	<i>0.975 J</i>	<i>1.01 J</i>	<i>0.975 J</i>	<i>12.3 -</i>
<i>TCA-C4-16^1-R</i>	<i>0.988 -</i>	<i>0.654 J</i>	<i>0.688 J</i>	<i>0.654 J</i>	<i>5.47 J</i>
<i>TCA-C4-16^1-R-D</i>	<i>1.11 -</i>	<i>0.613 J</i>	<i>0.638 J</i>	<i>0.613 J</i>	<i>5.94 J</i>
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.76	1.43	1.42	1.43	15.6
Max. >= Limit	Yes	No	No	No	No
W-statistic Prob. #	59.2% (N)	--	--	--	--
Test Procedure	Normal	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	2
% Nondetects	0%	0%	0%	0%	17%
Est. Mean*	1.33	--	--	--	--
UCL	<i>1.49</i>	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	pass	--	--	--	--
<i>a posteriori Sample</i>	5	--	--	--	--
Size calculation	Pass	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.

The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

Note 2: Modified results are in bold italics

**APPENDIX A**  
**REPROCESSED STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/  
 AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 5**

SAMPLE ID	PRIMARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
<i>TCA-C5-01^1-R</i>	<i>1.30 -</i>	<i>0.916 J</i>	<i>0.904 J</i>	<i>0.916 J</i>	<i>5.75 J</i>
<i>TCA-C5-03^1-R</i>	<i>1.22 -</i>	<i>0.952 J</i>	<i>0.977 J</i>	<i>0.952 J</i>	<i>13.5 -</i>
<i>TCA-C5-04^1-R</i>	<i>0.966 J</i>	<i>0.612 J</i>	<i>0.619 J</i>	<i>0.612 J</i>	<i>4.81 J</i>
TCA-C5-06^1-R	1.22 -	1.05 J	1.07 J	1.05 J	13.5 -
TCA-C5-06^1-R-D	1.12 -	0.851 J	0.848 J	0.851 J	12.0 -
TCA-C5-07^1-R	1.23 -	0.956 J	0.977 J	0.956 J	12.6 -
TCA-C5-08^1-R	1.21 -	0.854 J	0.873 J	0.854 J	10.4 J
TCA-C5-09^1-R	1.15 J	0.686 J	0.683 J	0.686 J	8.30 -
TCA-C5-10^1-R	0.956 -	0.651 J	0.672 J	0.651 J	15.8 -
TCA-C5-12^1-R	1.23 -	0.914 J	0.955 J	0.914 J	13.3 -
TCA-C5-13^1-R	1.26 -	0.970 J	0.959 J	0.970 J	12.5 -
TCA-C5-14^1-R	1.21 -	0.886 J	0.872 J	0.886 J	10.7 -
TCA-C5-16^1-R	1.26 -	0.812 J	0.818 J	0.812 J	16.5 -
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.27	1.05	1.07	1.05	16.5
Max. >= Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	0
% Nondetects	0%	0%	0%	0%	0%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori Sample</i>	--	--	--	--	--
Size calculation	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.

The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

Note 2: Modified results are in bold italics

**APPENDIX A**

**STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 6**

SAMPLE ID	PRIMARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
TCA-C6-01	1.31 -	0.765 -	0.788 -	0.765 -	8.81 -
TCA-C6-02	0.659 -	0.452 -	0.436 -	0.452 -	2.71 U
TCA-C6-04	0.906 -	0.694 -	0.685 -	0.694 -	8.33 -
TCA-C6-05	0.784 -	0.570 -	0.596 -	0.570 -	3.49 J
TCA-C6-07	0.905 -	0.671 -	0.677 -	0.671 -	2.57 U
TCA-C6-08	1.03 -	0.730 -	0.731 -	0.730 -	5.21 -
TCA-C6-09	1.06 -	0.794 -	0.793 -	0.794 -	13.7 -
TCA-C6-10	1.24 -	0.829 -	0.851 -	0.829 -	10.1 -
TCA-C6-10-D	1.16 -	0.826 -	0.860 -	0.826 -	6.34 -
TCA-C6-11	1.25 -	1.13 -	1.12 -	1.13 -	6.90 -
TCA-C6-13	1.77 -	1.52 -	1.52 -	1.52 -	3.01 -
TCA-C6-15	1.10 -	0.871 -	0.868 -	0.871 -	4.65 -
TCA-C6-16	1.25 -	1.06 -	1.03 -	1.06 -	7.62 -
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.77	1.52	1.52	1.52	13.7
Max. >= Limit	Yes	No	No	Yes	No
W-statistic Prob. #	90.3% (LN)	--	--	95.0% (LN)	--
Test Procedure	Lognormal	--	--	Lognormal	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	2
% Nondetects	0%	0%	0%	0%	17%
Est. Mean*	1.11	--	--	0.843	--
UCL	1.29	--	--	1.02	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	pass	--	--	pass	--
<i>a posteriori</i> Sample Size calculation	4 Pass	-- --	-- --	3 Pass	-- --

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.

The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.