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August 23, 2018

Ms. Linda Gersey
U.S. Nuclear Regulatory Commission
Region IV
1600 Lamar Boulevard
Arlington, TX 76011-4511

**SUBJECT: ORISE CONTRACT NO. DE-SC0014664
LETTER REPORT FOR ANALYTICAL DATA SUMMARY FOR 78 SOIL
SAMPLES ASSOCIATED WITH THE URANIUM ONE – IRIGARAY MINE
UNITS 1-9 IN JOHNSON COUNTY, WYOMING
DOCKET NO. 04008502; DCN: 5317-LR-04-0**

Dear Ms. Gersey:

The Oak Ridge Institute for Science and Education (ORISE) is pleased to provide the enclosed data summary package for 78 soil samples associated with the Uranium One – Irigaray Mine Units 1-9 in Johnson County, Wyoming. This summary includes soil data for Ra-226 that was previously analyzed and reported by the ORISE Radiological and Environmental Analytical Laboratory in DCN 5317-LR-01-0, DCN 5317-LR-02-0, and DCN 5317-LR-03-0.

Please feel free to contact me at 865.574.9802 or Erika Bailey at 865.576.6659 with any questions or comments.

Sincerely,



Forrest Smith
Laboratory Team Lead
ORISE

WFS:lw

Enclosures

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ANALYTICAL DATA SUMMARY FOR 78 SOIL SAMPLES ASSOCIATED WITH THE URANIUM ONE – IRIGARAY MINE UNITS 1-9 IN JOHNSON COUNTY, WYOMING

**F. Smith
ORISE**

FINAL REPORT

**Prepared for the
U.S. Nuclear Regulatory Commission**

August 2018

This document was prepared for the U.S. Nuclear Regulatory Commission (NRC) by the Oak Ridge Institute for Science and Education (ORISE) through an interagency agreement (NRC FIN No. F-1244) between the NRC and the U.S. Department of Energy (DOE). ORISE is managed by Oak Ridge Associated Universities under DOE contract number DE-SC0014664.

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URANIUM ONE SAMPLE ANALYSIS SUMMARY REPORT

1. Introduction

The U.S. Nuclear Regulatory Commission (NRC) requested that the Oak Ridge Institute for Science and Education (ORISE) perform an analytical data summary of approximately 78 soil samples associated with the Uranium One Irigaray Mine Units located in Johnson County, Wyoming. Sixty-three samples were collected in October 2017, and fifteen additional samples were collected in May 2018. The samples were shipped to the ORISE Radiological and Environmental Analytical Laboratory (REAL) for analysis of radium-226 (Ra-226), uranium-234, and uranium-235 by gamma spectroscopy and calculated total uranium.

2. Data Results

The analytical results were submitted to the NRC for evaluation. The ORISE REAL identified three locations with results that exceeded the Ra-226 release limit of 7 pCi/g. There were no samples with results that exceeded the total uranium limit of 152 pCi/g.

The ORISE REAL Ra-226 data set is presented in the following table. The values that exceed the Ra-226 release limit are highlighted in yellow.



**Table 2.1. REAL Radium-226 Data
October 2017**

NRC Sample ID:	Result (pCi/g)	TPU (2s)
BD106	6.65	0.40
Building Site	16.08	0.84
DP74	8.86	0.50
DP75	5.03	0.16
DV68	3.58	0.21
DM73	2.56	0.17
EB77	3.35	0.12
DX66	5.02	0.30
DJ84	3.15	0.11
DW78	2.74	0.19
DL75	3.25	0.20
DT72	3.80	0.24
DN74	3.39	0.12
DW66	3.98	0.24
DL78	3.01	0.19
DW67	3.28	0.13
DL73	1.95	0.13
DU72	4.13	0.25
DU70	3.64	0.13
DI81	2.70	0.17
DL83	3.32	0.21
DM76	2.550	0.097
DV67	3.82	0.21
DM75	4.25	0.25
DN75	2.27	0.15
DP72	2.14	0.14
DZ65	2.95	0.11
DM72	5.82	0.33
DX77	3.30	0.21
DV78	2.64	0.11
DO74	4.18	0.30
BS93	2.62	0.18
DQ76	8.71	0.24
DJ66	2.21	0.14
AS112	1.348	0.063
CB95	2.49	0.16
BF106	3.20	0.12
X103	2.25	0.15
AW99	1.72	0.12
CK82	2.35	0.14
P110	3.71	0.12
DF66	4.13	0.24
CF82	1.59	0.11
AU109	1.42	0.10



**Table 2.1. REAL Radium-226 Data
October 2017**

NRC Sample ID:	Result (pCi/g)	TPU (2s)
BM99	2.477	0.089
CE84	1.81	0.12
K99	2.31	0.15
CM81	3.17	0.21
BW88	2.41	0.15
DG67	2.96	0.19
AU101	2.351	0.085
AF103	1.77	0.13
BA107	2.88	0.18
DD69	2.26	0.15
AZ105	2.28	0.15
CY67	1.683	0.071
BD104	2.94	0.19
AI105	1.96	0.13
CO79	2.61	0.15
CH93	3.79	0.21
DN63	3.18	0.20
DN73	3.52	0.22
CH92	3.87	0.23

3. Additional Sample Analysis

The NRC collected an additional 15 samples on May 17, 2018, and submitted the samples to the ORISE REAL for analysis of Ra-226 and total uranium by gamma spectroscopy. REAL identified three locations with results that exceeded the Ra-226 release limit, as shown in the following table. No results exceeded the total uranium release limit.



Table 3.1. REAL Ra-226 Data May 2018

NRC Sample ID:	Result (pCi/g)	TPU (2s)
SW Corner 1-6	1.29	0.11
SE Sump 1-6	2.52	0.15
W Sump 1-6	1.58	0.11
Crack in floor 1-6	1.29	0.11
middle trench 1-6	11.62	0.60
DM-73	2.94	0.17
Building site	3.05	0.19
DO-73	8.65	0.49
BD-106	3.50	0.21
DR-74	12.85	0.69
DQ-72	3.68	0.22
DP-74	1.44	0.11
DT-72	2.99	0.19
DQ-75	5.61	0.30
DQ-76	2.10	0.13

4. Summary

REAL identified six locations that exceeded the site release limit of 7 pCi/g for Ra-226. There were no locations identified that exceeded the release limit of 152 pCi/g for total uranium.