STRATA ENERGY INC

A WHOLLY-OWNED SUBSIDIARY OF PENINSULA ENERGY LIMITED

February 28, 2017

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Deputy Director, Division of Decommissioning, Uranium Recovery and Waste Programs
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T-8F5, 11545 Rockville Pike
Rockville, MD 20852-2738

RE: Strata Energy Inc. Ross ISR Project
Source Materials License SUA-1601, Docket No. 40-9091
July - December 2016 Semi-Annual Effluent Report

To Whom it May Concern,

Strata Energy, Inc. (Strata) hereby submits this Semi-Annual Report for the period of July 1, 2016 through December 31, 2016. This report satisfies the requirements of 10 CFR 40.65 and the applicable license conditions of Source Materials License SUA-1601. In March 2017, Strata will provide the results of the effluent air particulate and a summary of the results under a separate cover.

If you have any questions regarding the provided information, please contact me at (307) 467-5995 or by email at mgriffin@stratawyo.com.

Sincerely,
STRATA ENERGY INC.

Michael Griffin
Vice President of Permitting, Regulatory and Environmental Compliance

cc: Ben Schiffer, WWC Engineering

Attachments: July - December 2016 Semi-Annual Report

NMSS01

Strata Energy, Inc.

Ross ISR Project

Source Material License Number SUA-1601

Docket Number 040-09091

Semi-Annual Effluent and Environmental Monitoring Report

July 1st – December 31st, 2016

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APPENDICES

1 INTRODUCTION

Pursuant to 10 CFR 40.65 and Source Material License SUA-1601, Strata Energy, Inc. (Strata) has prepared this Semi-Annual Report which summarizes the operational and environmental activities at the Ross Project. The report includes that information required by License Condition 11.1 and 11.2, as applicable. This report covers the time period from July 1st – December 31st, 2016.

1.1 ACTIVITIES SUMMARY

Strata commenced uranium recovery operations at the Ross Project on December 2, 2015. The project is licensed for the construction and operation of a full Central Processing Plant (CPP); however, the current operations at the CPP are limited to the processing of wellfield recovery fluids by ion exchange with the uranium loaded resin transported to the NRC licensed Irigaray Ranch facility for processing into yellowcake. In summary, the activities occurring at the Ross Project are analogous to an ISR satellite facility.

Currently (through December 31, 2016) two wellfields, Mine Units 1 and 2, have been approved by the appropriate regulatory agencies and the Strata Safety and Environmental Review Panel (SERP) and are in operation. No other wellfields are in either active operation or restoration status at the Ross Project.

Drilling, well construction, mechanical integrity testing, and hole plugging activities were continued in Mine Units 1 and 2 during the reporting period.

The monitoring for air particulates, direct radiation, and radon continued at the environmental monitoring stations. Surface water sampling continued at the three surface water monitoring stations and applicable reservoirs. Groundwater monitoring continued for the wells specified in SUA-1601.

2 LICENSE CONDITION 10.8(D) – QUARTERLY INSPECTION OF LINED RETENTION PONDS

There is currently one constructed lined retention pond at the Ross Project. This lined retention pond (Pond 1) is separated into three cells (Cells 1 - 3). There is currently byproduct material being stored in Cells 2 and 3. Cell 1, which is the southernmost cell, contains only direct precipitation. Two quarterly inspections of Pond 1 occurred during the inspection period. The results of the inspections indicate that all embankments are in good condition, there have been no leaks in the liner of Pond 1, and all systems and components are in good condition. The inspection reports are available at the Ross Project.

3 LICENSE CONDITION 10.8(E) – ANNUAL TECHNICAL INSPECTION OF LINED RETENTION PONDS

3.1 INSPECTION SUMMARY

The annual inspection of the lined retention ponds was conducted on May 26, 2016 by WWC Engineering. The report of the inspection was provided in the previous semi-annual report.

4 LICENSE CONDITION 11.1(C) – OPERATIONAL MONITORING

4.1 STATUS OF WELLFIELDS IN OPERATION

There are currently (through December 31, 2016) two wellfields in operation, Mine Units 1 and 2. There are currently four header houses in operation in Mine Unit 1 and one header house in operation in Mine Unit 2. Start dates for recirculation and conveyance to the CPP for each header house are listed below.

Mine Unit	Header House	Recirculation Start Date	Conveyed to CPP Start Date
1	1	01-Dec-15	01-Dec-15 (recirculated through the plant)
1	2	27-Jan-16	19-Feb-16
1	3	20-Apr-16	16-May-16
1	4	09-Jun-16	21-Jun-16
2	5	30-Sept-16	27-Dec-16

4.2 PROGRESS OF WELLFIELDS IN RESTORATION

There are no wellfields in restoration at the Ross Project.

4.3 STATUS OF LONG TERM EXCURSIONS

No excursions have occurred at the Ross Project.

4.4 SUMMARY OF MECHANICAL INTEGRITY TESTS

4.4.1 Third Quarter

Thirteen (13) MU1 wells located in Section 18 T53N R67W passed mechanical integrity test (MIT) during the period. One well (MU1-OZ96) passed a second MIT after replacement of the screen.

Three (3) MU2 replacement monitor wells passed the MIT in the third quarter. Two of the wells are located in Section 18 T53N R67W, and one well is located in Section 13 T53N R68W.

In the third quarter 161 MU2 wells located in Section 18 T53N R67W passed the MIT. One well, MU2-OZ61, passed a second MIT after replacement of the screen.

4.4.2 Fourth Quarter

Twenty-one (21) MU1 wells located in Section 18, T53N, R67W and 4 MU1 wells located in Section 7, T53N, R67W passed mechanical integrity test (MIT) during the fourth quarter.

During the quarter fourth 63 MU2 wells located in Section 18, T53N, R67W and 36 MU2 wells located in Section 13, T53N, R68W passed MIT.

5 LICENSE CONDITION 11.1(D) – ENVIRONMENTAL MONITORING

Source Material License SUA-1601 License Condition 10.9 requires Strata to conduct an effluent and environmental monitoring program in accordance with the programs described in the approved license application. Section 5.7.7 and 5.7.8 of the Technical Report (TR) of the approved License Application describe the operational effluent and environmental monitoring at the Ross Project.

Strata currently has six environmental monitoring stations. Each monitoring station has a continuous air sampler for measuring the concentration of air particulates, a dosimeter to measure direct radiation, and

a detector for measuring radon gas in air. The locations of the monitoring stations are consistent with the recommendation set forth in Regulatory Guide 4.14 and are discussed in detail in the TR Section 2.9.2.4.

The environmental monitoring station names and descriptions are as follows:

- "Oshoto" – This location is Northeast and downwind of the CPP. It is near a private residence;
- "Met Station" – This location is Northwest of the CPP and is located at the site where the meteorological station was previously operated;
- "Southwest" – This location is Southwest and upwind of the CPP and wellfields. Per the TR Section 2.9.2.4, this located is the designated "background location";
- "East" – This location is East of the CPP;
- "South" – This location is South and upwind of the CPP; and
- "North" – This location is North and downwind of the CPP and wellfields. The MILDOS-AREA computer model results show that this location is the "maximally exposed member of the public".

5.1 AIR PARTICULATES

Strata conducts continuous air sampling to determine particulate concentrations in the air. The air particulate sampling is conducted according to TR Section 5.7.7.1.1 and guidance contained in NRC Regulatory Guide 4.14 Section 2.1.2. The air monitoring is currently conducted at six environmental monitoring stations. Air filters are collected weekly, or more often as required by dust loading, and composited for analysis on a quarterly basis. The filters are sent to an accredited contract laboratory for analysis for total uranium, Ra-226, Th-230, and Pb-210.

The operational air particulate monitoring continued at all six sites during the reporting period. The results from the air particulate monitoring are summarized in Appendix A, Table 1. The appropriate values from 10 CFR 20, Appendix B Effluent Concentration Limits for comparison and the appropriate Lower Limits of Detection (LLD) are also included in Appendix A, Table 1. The LLD meet those specified in Regulatory Guide 4.14. The 10 CFR 20, Appendix B, Table 2 values associated with class "W" were used for natural uranium and Th-230.

A review of the data indicates that the air particulate concentrations are consistent with concentrations obtained during the preoperational monitoring period and during 2015 and the first half of 2016 and there is no evidence of any impacts from the current operations.

5.2 DIRECTION RADIATION

Strata conducts a direct radiation monitoring program to monitor the direct radiation levels at the six environmental monitoring stations discussed above. The direct radiation levels are measured using LANDAUER® InLight® optical stimulated luminescence (OSL) dosimeters. The OSL dosimeters are exchanged quarterly and sent to LANDAUER®, a NVLAP-accredited company, for analysis. The direct radiation monitoring program is conducted according to the TR Section 5.7.7.1.1 and NRC Regulatory Guide 4.14, Section 2.1.6.

A summary of the data obtained from the radiation monitoring program for the reporting period is included in Appendix A, Table 2. Data is presented as gross readings.

A review of the data indicates that the gross results are consistent with those obtained during the preoperational monitoring period and during 2015 and the first half of 2016 and there is no evidence of any impacts from the current operations.

5.3 RADON

Strata conducts continuous monitoring for radon gas in accordance with the TR Section 5.7.7.1.1 and NRC Regulatory Guide 4.14 Section 2.1.2. The radon gas is measured using LANDAUER® high sensitivity environmental radon alpha-track detectors. The detectors are exchanged quarterly and sent to LANDAUER® for analysis. The detectors are placed at the six environmental monitoring stations described above. A summary of the data obtained from the radon gas monitoring is included in Appendix A, Table 3. The 10 CFR 20, Appendix B, Table 2 effluent concentration value of 1.00E-10 µCi/mL for radon with daughters present is also included in Table 3 for comparison.

A review of the data indicates that the results are consistent with those obtained during the preoperational monitoring period and during 2015 and the first half of 2016 and there is no evidence of any impacts from the current operations.

5.4 SOIL

Strata conducts soil sampling on an annual basis at the sites of the six environmental monitoring locations. The soil samples are collected according to the procedures outlined in the TR Section 5.7.7.1.2 and NRC Regulatory Guide 4.14 Section 2.1.5. The samples are analyzed for total uranium, Ra-226, Pb-210, and gross alpha.

Soil samples were collected on October 10, 2016 at each of the environmental monitoring locations described above. The samples consisted of the top six inches of soil from each location. The results are provided in Appendix A, Table 4. The reporting limits in Appendix A, Table 4 met the LLDs from Regulatory Guide 4.14, Section 5.

The results are consistent with the results obtained during 2015 and the preoperational monitoring, with the exception of gross alpha. The difference in gross alpha can be attributed to the contract laboratory reporting limit, which was changed following preoperational monitoring. During the preoperational monitoring the reporting limit for gross alpha was 1.0E-06 µCi/g and the current reporting limit is 1.0E-05 µCi/g. Regulatory Guide 4.14 does not stipulate a lower limit of detection for gross alpha and thus the increased reporting limit is acceptable.

5.5 SEDIMENT

Strata conducts sediment sampling on an annual basis at the three surface water monitoring stations and at applicable reservoirs within the project area. The sediment samples are collected according to the procedures outlined in the TR Section 5.7.7.1.2 and NRC Regulatory Guide 4.14 Section 2.1.5. The samples are analyzed for total uranium, Th-230, Ra-226, Pb-210, and gross alpha.

One sediment sample was collected from each of the surface water monitoring stations. The samples were collected on October 10, 2016 and consisted of the top six inches of sediment from each location. The results are provided in Appendix A, Table 5. The reporting limits in Appendix A, Table 5 met the LLDs

from Regulatory Guide 4.14, Section 5. No sediment samples were collected from Oshoto Reservoir in 2016.

The sediment results are consistent with those obtained during the preoperational monitoring period and during 2015 and the first half of 2016 and there is no evidence of any impacts from the current operations.

5.6 GROUNDWATER

5.6.1 Private Water Supply Wells

Strata conducts monitoring of private water supply wells in accordance with License Condition 11.1 D), and TR Section 5.7.8.2, which are based on the guidance in NRC Regulatory Guide 4.14 Section 2.1.3. All wells which are currently in use for domestic, agricultural, and livestock purposes and within 2 kilometers of the monitor well ring for active mine units are sampled quarterly and sent to an accredited contract laboratory for analysis for dissolved and suspended uranium, Ra-226, Th-230, Pb-210, Po-210, gross alpha, and gross beta. An inventory of the private water supply wells is provided in Appendix A, Table 6.

Seventeen private water supply wells were within 2 kilometers of the monitor well ring for MU1 and an additional three private water supply wells were within 2 kilometers of the monitor well ring for MU2 during the reporting period. Sampling occurred between July 15, 2016 and July 27, 2016 for the third quarter and on October 5, 2016 for the fourth quarter.

One well, P206432W, was added to the inventory. This well was previously a regional monitor well that was transferred to a landowner in November 2016. It was not sampled as it was not yet equipped with the necessary pump infrastructure to allow sample collection. Two wells, HBWELL05 and P23418P, were not sampled during the reporting period as the pump infrastructure has not been maintained to suitable standards for obtaining a sample. An additional six wells were not sampled because they were either not in use, could not be located or have been replaced and the SEO permits have not been cancelled.

A summary of the results from the monitoring for the reporting period are included in Appendix A, Table 7. The LLD and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide of interest are included in Appendix A, Table 8.

A review of the data indicates that all parameters are below the applicable effluent concentration limits and are consistent with results obtained during the preoperational monitoring and during 2015 and the first half of 2016 and there is no evidence of any impacts from the current operations.

5.6.2 Industrial Wells

Strata monitors the groundwater quality of industrial wells used for oil field water flood purposes in accordance with License Condition 10.19 and the TR Section 5.7.8.2. The industrial wells are sampled on a monthly basis when those wells are near active wellfields in accordance with License Condition 10.19 and the samples are sent to an accredited contract laboratory for analysis for dissolved and suspended uranium, Ra-226, Th-230, Pb-210, Po-210, gross alpha, and gross beta. Two industrial wells were sampled during the reporting period, wells 19XX18 and 22X-19. A summary of the results from the monitoring for the reporting period are included in Appendix A, Table 9. The LLD and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide are included in Appendix A, Table 8.

Samples were not collected from industrial well 19XX18 in November and December and well 22X-19 in October, November or December since they were not operation.

A review of the results indicates are similar to the results obtained during 2015 and the first half of 2016. For industrial well 19XX18, the Ra-226 (dissolved) levels have remained consistently near 60% of the effluent concentration. The Pb-210 (dissolved) levels were similar to those measured in the first half of 2016. The Pb-210 (suspended) and Po-210 (suspended) levels are over half of those measured in the first half of 2016 and were similar to those measured in 2015. All concentrations in well 22X-19 are at similar levels to those obtained during previous reporting periods. The occurrence of low levels of radionuclides in these wells is natural since they are completed in the mineralized formation and are not being impacted by ISR activities at the Ross Project.

5.7 SURFACE WATER

Strata conducts monitoring of surface waters in accordance with TR Section 5.7.8.2. Surface water features that lie within the license boundary and may be impacted by operations are sampled and analyzed for dissolved and suspended uranium, Ra-226, Th-230, Pb-210, Po-210, gross alpha, and gross beta. The samples are collected quarterly, when water is available. For the reporting period, site R-2 (Oshoto Reservoir) was the only reservoir with the potential to be impacted by operations. Samples were collected on July 18, 2016 for the third quarter and October 13, 2016 for the fourth quarter and are included in Appendix A, Table 10. The LLD and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide are included in Appendix A, Table 8.

Strata additionally has three ISCO flowmeters/samplers located along waterways, two of which collect samples of surface water when a pre-identified flow rate of the waterway is attained. The samplers are run from April through October. No samples were obtained from the ISCO samplers during the reporting period. However, Strata obtained a grab water sample from the one site (SW-3) with flowing water on August 3, 2016, as recommended in Regulatory Guide 4.14. The sample was analyzed for dissolved and suspended uranium, Ra-226, Th-230, Pb-210, Po-210, gross alpha, and gross beta. The results are included in Appendix A, Table 10. The LLD and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide are included in Appendix A, Table 8. Uranium (dissolved) and Pb-210 (suspended) were 4% and 11% of the effluent concentration limits, respectively.

5.8 POND MONITORING WELLS

License Condition 10.20 requires Strata to conduct a groundwater detection monitoring program for the retention ponds that meet the requirements of Criteria 5 and 7A of 10 CFR 40, Appendix A. The elements in the program are required to be documented in Standard Operating Procedures. Those procedures are contained in Strata's Environmental Management Program (EMP).

As reported by email on April 27, 2016 and by letter dated May 4, 2016, Strata had a sample from Pond 1 monitor well (MW) P1-C3 that exceeded the chloride action level by more than 20 percent. Strata performed the immediate actions in the EMP. An investigation into the probable cause of the action level exceedance concluded that the action level exceedance was caused by variation in shallow groundwater quality and not by a release from the pond. More specifically, the primary source of variation is mixing of differing surficial aquifer waters induced by Strata's dewatering activities. The potential for effluent

released during the March 3, 2016 spill near Pond 1 to have altered the water quality measured in MW P1-C3 was evaluated. Average linear velocities were determined based on a conservative hydraulic conductivity estimate of 3.0 feet/day for the bedrock sandstone and sandy alluvial fill deposits in the area, a porosity of 46% based on permeability tests performed on samples taken at the retention ponds, and a distance of 353 feet from the spill location to MW P1-C3. The water level gradient between the spill and the well measured on March 18, 2016 was 0.2 feet/feet. Based on these assumptions, it would have required approximately 95,000 days to effect the water quality measured at MW P1-C3.

The results of this investigation were documented in a report dated October 7, 2016 and submitted to NRC staff. Based on the results of the investigation and groundwater monitoring results, new action levels were established by the Strata SERP (SERP 16-7) and are shown in the table below.

Pond Compliance Monitor Well Action Levels

Parameter	MW P1-C1 and MW P1-C3[1]	MW P1-C2 and MW P1-C5[1]
Alkalinity, Total (mg/L as $CaCO_3$)	915	758
Chloride (mg/L)	19.6	79.5
EC (µmhos/cm)	4,248	7,930

[1] The wells were combined based on hydrogeologic characteristics. Wells MW P1-C1- and MW P1-C3 are completed in the shallow alluvium, while wells MW P1-C2 and MW P1-C5 have a bedrock aquifer component to the screened interval.

5.9 FRENCH DRAIN AND LINED RETENTION POND UNDERDRAIN

As part of the initial CPP area construction activities a containment barrier wall (CBW) with an associated French drain was installed to the south of the CPP and the lined retention ponds to depress the shallow groundwater. This was required to facilitate the construction of the lined retention pond and prevent the shallow groundwater from affecting the pond liner system. Discharges from the French drain and lined retention pond underdrain are permitted through the Wyoming Department of Environmental Quality, Water Quality Division. Each discharge point is equipped with a totalizing meter. The flow rate for the French drain averaged 876 gpd for the third quarter and 856 gpd for the fourth quarter. The flow rate for the lined retention pond underdrain averaged 2,086 gpd for the third quarter and 1,945 gpd for the fourth quarter. The flow rates for the French drain were near what was estimated in Ross TR Addendum 3.1-A (778 gpd). The lined retention pond underdrain flow rates were higher than those estimated in the Ross TR (26 to 28 gpd) since the values assumed that a French drain would be installed on the west side of the pond thereby decreasing the amount of shallow groundwater flowing under the pond.

6 LICENSE CONDITION 11.1(D) – OPERATIONAL EFFLUENT MONITORING

Strata's effluent monitoring program was approved by the NRC staff by a verification letter dated November 19, 2015 (ADAMS accession number ML15302A405).

6.1 EFFLUENTS DUE TO AIR PARTICULATES

6.1.1 Plant

In order to measure the quantity of effluent released from the processing facility as air particulates, Strata submits quarterly composite samples obtained from periodic air sampling events at three locations within the processing facility to an outside accredited laboratory. The composite samples are analyzed for the

radionuclides of concern, namely U-Nat, Th-230, Ra-226, and Pb-210. The three locations are the Ion Exchange Area, the Reverse Osmosis Area, and the Laboratory. The reported concentrations are averaged across the three locations and then multiplied by the air ventilation rate of the processing facility and the length of time in the reporting period to determine the total quantity of effluent released in the form of air particulates from the processing facility.

The results are displayed in Appendix A, Table 11 and show that all of the results were non-detect for the third quarter. Due to a delay in sample submittal the fourth quarter results in Appendix A, Table 11 and a summary of results will be provided to the NRC staff under a separate cover in March 2017.

Beginning in the third quarter the contract laboratory changed the reporting limits based on the 10 CFR Part 20 Occupational Limits. The Ra-226, Th-230, and U-nat reporting limit changed from 1E-16 µCi/mL to 1E-12 µCi/mL and the Pb-210 reporting limit changed from 2E-15 µCi/mL to 2E-12 µCi/mL.

6.1.2 Wellfield

Wellheads are not considered sources of air particulates and Strata's deep disposal well building only contains a sealed wellhead and no ventilation system. Although it is very unlikely that air particulates will be generated at header houses since all fluids are within pressurized piping, it has been assumed that header houses could be a diffuse source of air particulates at the Ross Project. Therefore, monthly air particulate samples are obtained from each header house and submitted as a composite sample to an outside accredited laboratory. The composite samples are submitted semi-annually and analyzed for U-Nat, Ra-226, Th-230, and Pb-210. The results are averaged to determine the average concentration of air particulates in the header houses. This average concentration is then multiplied by the design ventilation rate of the two ventilation fans in each header house, the time of the reporting period, and the number of header houses to determine the total quantity of effluent released in the form of air particulates due to operations in the wellfield.

Each ventilation fan in the header houses is rated at 167 CFM (4.7E6 mL/minute). There are two ventilation fans in each header house. Due to a delay in sample submittal the results typically provided in Appendix A, Table 12 and a summary of the results will be provided to the NRC staff under a separate cover in March 2017.

6.2 EFFLUENTS DUE TO RADON AND RADON PROGENY

The term radon progeny refers to the long lived decay products of Rn-222. Strata will assume equilibrium between radon and radon progeny.

6.2.1 Plant

To determine the quantity of effluent released from the plant as radon and radon progeny, Strata has committed to obtaining periodic samples of process fluid and analyzing the solution for the quantity of Rn-222. Samples are obtained from the recovery and injection solutions and sent to an outside accredited laboratory for analysis of the concentration of Rn-222. The concentration of Rn-222 is multiplied by the average process fluid flow for the time period to determine the quantity per unit time of Rn-222 which was in the processing facility on the recovery side and the quantity per unit time on the injection side. The quantity per unit time of Rn-222 from the injection portion is subtracted from the quantity per unit time

of Rn-222 from the recovery portion and the resulting number is designated as the "loss term". This loss term is multiplied by the time period covered by the sampling to yield a total quantity released. Thus this method determines the effluent released by assuming that a drop in the concentration of Rn-222 from the recovery portion to the injection portion is being released inside the plant and subsequently exhausted to the outside.

In order to determine the average process fluid flow for a month, the daily flow rates for the injection and recovery solutions were averaged for the month. The daily flow rates were recorded as gallons per minute, thus the conversion factor of 1 gallon = 3,785 milliliters was used to convert to milliliters per minutes (mLPM). The time used for calculating the effluent released was the number of days in the month. An example of how the quantity of effluent released was calculated will be for the month of July. The quantity per unit time of Rn-222 in the injection solution (5.2E-05 µCi/mL * 6.9E06 mLPM = 360 µCi/minute) was subtracted from the quantity per unit to time of Rn-222 in the recovery solution (5.4E-05 µCi/mL * 7.2E06 mLPM = 388 µCi/minute) to yield a loss term of 29 µCi/minute. This number was multiplied by the total time (30 days * 24 hr/day * 60 minutes/hour = 43,200 minutes) to yield the effluent released of 1.2 Ci. Note that the displayed average flow is equivalent for the recovery and injection solutions due to only displaying one significant figure in scientific notation. The actual volumes of 7,153,601 mLPM for recovery and 6,905,166 mLPM for injection were used for the calculation.

A summary of the results for the monitoring period are displayed in Appendix A, Table 13. The duplicate samples were not included in determining the total quantity of effluent released during the reporting period. The results for the reporting period are consistent with June 2016 results, which indicates that the current sampling protocol is a viable method for determining the quantity of effluent released from the processing facility.

6.2.2 Wellfield

To determine the quantity of effluent released from the wellfield, track-etch devices were placed in each header house and in 10% of the recovery wellheads. Since injection wells have sealed wellheads, they are not significant sources of radon and radon progeny. The reported concentrations obtained from the header houses are averaged and this number is multiplied by the design ventilation rate, the time of the reporting period, and the number of header houses in operation. For the wellheads, the reported concentrations are averaged and the number is multiplied by a ventilation rate of 2 LPM, the time of the reporting period, and the total number of recovery wells in operation.

The track-etch devices were placed in header houses 1-4 and all associated wells from July 8, 2016 to September 29, 2016 for the third quarter and from October 1, 2016 to January 2, 2017 for the fourth quarter, for a total time of 176 days. The ventilation rate of the header houses is 9.5E6 mLPM (2 fans at 4.7E6 mLPM each).

A summary of the results from the monitoring period are displayed in Appendix A, Table 14. The total effluent released is displayed in Appendix A, Table 15. A review of the data indicates that a minimal amount of radon and radon progeny is released from the wellfield. The results from header house 5 are not included in this reporting period as the results have not yet been received. The results will be provided in the first semi-annual report of 2017.

6.2.3 Unplanned Releases

Two unplanned reportable releases of process fluid occurred at the Ross Project during the reporting period. A reportable release occurred on July 19, 2016 (reported to NRC staff on July 20, 2016 NRC Accession No. ML16204A006) with an estimated 1,620 gallons of fluid being released. The fluid was from Pond 1 Cell 3 which is comprised mainly of injection solution. The other reportable release occurred on October 11, 2016 (reported to NRC staff on October 12, 2016 NRC Accession No. ML16319A255) with an estimated 1,000 gallons of injection fluid being released. A summary of the estimated quantity of fluid released, the injection Rn-222 concentration found for that month, and the calculated Rn-222 released from the event is provided in Appendix A, Table 16. The conversion factor of 1 gallon = 3,785 milliliters was used.

6.3 BACKGROUND

The background concentration levels for radon and air particulates are the radon and air particulate concentration levels measured at the environmental monitoring station designated as the background location (the "Southwest" site).

6.3.1 Radon and Radon Progeny

As reported in Appendix A, Table 3, the value obtained from the background location is an average radon concentration of 6.8E-10 µCi/mL. This background value was not subtracted from the concentrations of effluent found in the processing facility as the concentrations obtained were from the process fluid, not the surrounding atmosphere. The method determines the effluent released by measuring a difference in concentrations in the process fluid and then assuming that difference is exhausted, thus a consideration of background would not be appropriate. A consideration of background in regards to unplanned releases is also not appropriate since the release is calculated based off of the concentration of Rn-222 in the process fluid released and not on the concentration of Rn-222 in the surrounding atmosphere. The background concentration was subtracted in regards to effluents in the wellfield as displayed by the net average concentration in Appendix A, Table 15.

6.3.2 Air Particulates

Background values for air particulates are reported in Appendix A, Table 1. These values were not subtracted from the processing facility results since all of the results were not detect for the third quarter (Appendix A, Table 11). The air particulate results for the fourth quarter will be provided to NRC staff under a separate cover and the background values will be subtracted from the processing facility results if measurable concentrations are reported.

6.4 TOTAL QUANTITIES RELEASED

The three sources of effluent at the Ross Project have been identified as the processing facility, the wellfield, and any unplanned releases of process fluids. The deep disposal well building is not currently considered a source of effluent as the building only contains a sealed wellhead. All pumps associated with the system are contained in the processing facility. Additionally, the deep disposal well building does not contain a ventilation system.

6.4.1 Quantity of Air Particulate Effluent

The quantity of effluent released in the form of air particulates typically summarized in Appendix A, Table 17 and a summary of the results will be provided to NRC staff under a separate cover in March 2017.

6.4.2 Quantity of Radon and Radon Progeny Effluent

The Rn-222 effluent released from the plant is calculated as 7.7 Ci. The Rn-222 effluent released from the wellfields is calculated as 9.1E-02 Ci. The effluent released from unplanned releases is calculated as 1.1E-05 Ci. The summation of the three sources of effluent yields a total quantity of Rn-222 effluent released of 7.7 Ci.

6.4.3 Conclusion

As stated in 10 CFR § 40.65: "If quantities of radioactive materials released during the reporting period are significantly above the licensee's design objective previously reviewed as part of the licensing action, the report shall cover this specifically." Strata previously estimated the quantity of effluent released in its TR Section 7.3. Strata stated: "The Ross ISR project has the potential to produce radiological effluent in the form of Rn-222 that is dissolved in the production and restoration fluid and is present as a result of the uranium decay series. It is assumed there will be no particulate emissions during routine operations of this facility as the facility will use modern, low temperature vacuum driers, the particulate release of which is considered to be zero by the NRC as provided in NUREG 1910."

Conclusions on the lack of effluent in the form of particulates will be provided to NRC staff under a separate cover in March 2017.

In regards to the quantity of effluent from Rn-222, the TR Section 7.3.4.4 estimated the following: 122 Ci/yr from recovery wells in Mine Unit 1 and 71.2 Ci/yr from operations in the plant. The quantities of effluent found during this reporting period are below what was estimated in the license application review process.

7 LICENSE CONDITION 11.1(E) AND (F) AND 11.2 - ANNUAL REPORT

The annual report requirement for these license conditions covering the submittal of SERP reviews and changes and inventory of water supply wells and land use survey within 2 km of a production area and the results of the annual ALARA audit and an analysis of the dose to the public will be submitted within 90 days following the completion of the reporting period (December 31, 2016).

APPENDIX A

Tables

Table 1 - Environmental Air Particulates Monitoring Results, 3Q and 4Q 2016

Location	Sample Period	Radionuclide	Concentration (µCi/mL)	Error ± (µCi/mL)	LLD (µCi/mL)	10CFR20, App B Table 2 Values (µCi/mL)	Percent Effluent Concentration Limit (%)
Oshoto							
	3rd Quarter	U-Nat	3.2E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	1.3E-16	3.1E-17	1E-16	9E-13	0
		Pb-210	1.7E-14	1.8E-15	2E-15	6E-13	2.8
	4th Quarter	U-Nat	1.5E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	2.2E-16	5.6E-17	1E-16	9E-13	0
		Pb-210	1.6E-14	1.2E-15	2E-15	6E-13	2.7
North (maximally exposed member of the public)							
	3rd Quarter	U-Nat	ND	N/A	1E-16	9E-13	N/A
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	1.4E-16	5.3E-17	1E-16	9E-13	0
		Pb-210	1.7E-14	1.4E-15	2E-15	6E-13	2.8
	4th Quarter	U-Nat	1.4E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	2.0E-16	6.1E-17	1E-16	9E-13	0
		Pb-210	1.6E-14	1.3E-15	2E-15	6E-13	2.7
Met Station							
	3rd Quarter	U-Nat	ND	N/A	1E-16	9E-13	N/A
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	1.4E-16	2.7E-17	1E-16	9E-13	0
		Pb-210	1.5E-14	1.3E-15	2E-15	6E-13	2.5
	4th Quarter	U-Nat	1.3E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	2.5E-16	5.7E-17	1E-16	9E-13	0
		Pb-210	1.8E-14	1.3E-15	2E-15	6E-13	3.0

N/A – Not Applicable, ND – Non-Detect

Table 1 - Environmental Air Particulates Monitoring Results, 3Q and 4Q 2016 (Continued)

Location	Sample Period	Radionuclide	Concentration (µCi/mL)	Error ± (µCi/mL)	LLD (µCi/mL)	10CFR20, App B Table 2 Values (µCi/mL)	Percent Effluent Concentration Limit (%)
Southwest (Background)							
	3rd Quarter	U-Nat	ND	N/A	1E-16	9E-13	N/A
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	1.4E-14	1.2E-15	2E-15	6E-13	2.3
	4th Quarter	U-Nat	2.5E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	1.4E-16	5.7E-17	1E-16	9E-13	0
		Pb-210	1.7E-14	1.2E-15	2E-15	6E-13	2.8
East							
	3rd Quarter	U-Nat	1.8E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	1.2E-16	5.3E-17	1E-16	9E-13	0
		Pb-210	1.6E-14	1.4E-15	2E-15	6E-13	2.7
	4th Quarter	U-Nat	3.9E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	2.1E-16	6.1E-17	1E-16	9E-13	0
		Pb-210	1.5E-14	1.2E-15	2E-15	6E-13	2.5
South							
	3rd Quarter	U-Nat	1.4E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	1.7E-14	1.6E-15	2E-15	6E-13	2.8
	4th Quarter	U-Nat	1.2E-16	N/A	1E-16	9E-13	0
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	2.5E-16	6.0E-17	1E-16	9E-13	0
		Pb-210	1.6E-14	1.3E-15	2E-15	6E-13	2.7

N/A – Not Applicable, ND – Non-Detect

Table 2 - Environmental Direct Radiation Monitoring Results, 3Q and 4Q 2016

Location	3rd Quarter Gross mrem/quarter	4th Quarter Gross mrem/quarter	Location Average mrem/quarter
Oshoto	33.3	45.4	39.4
North (maximally exposed member of the public)	33.3	*	33.3
Met Station	35.3	39.6	37.5
Southwest (Background)	34.3	42.8*	38.6
East	31.6	34.6	33.1
South	35.1	37.1	36.1

*North detector was lost in the 4th quarter and the Southwest detector was damaged

Table 3 - Environmental Radon in Air Results, 3Q and 4Q 2016

Location	3rd Quarter (µCi/mL)	Uncertainty ± (µCi/mL)	4th Quarter (µCi/mL)	Uncertainty ± (µCi/mL)	Annual Location Average (µCi/mL)	10CFR20, App B Table 2 Value (µCi/mL)	Percent Effluent Concentration Limit (%)
Oshoto	4.0E-10	1.0E-10	9.0E-10	1.0E-10	6.3E-10	1E-10	630
North (maximally exposed member of the public)	3.0E-10	9.0E-11	6.0E-10	1.0E-10	5.3E-10	1E-10	530
Met Station	3.0E-10	1.0E-10	8.0E-10	1.0E-10	6.0E-10	1E-10	600
Southwest (Background)	4.0E-10	1.0E-10	5.0E-10	1.0E-10	6.8E-10	1E-10	680
East	2.0E-10	9.0E-11	5.0E-10	1.0E-10	4.5E-10	1E-10	450
South	4.0E-10	1.0E-10	5.0E-10	1.0E-10	4.3E-10	1E-10	430

Table 4 - Soil Sample Results, Annual 2016 (Collected October 10, 2016)

Location	Radionuclide	Concentration (µCi/g)	Error ± (µCi/g)	Reporting Limit (µCi/g)
Oshoto				
	U-Nat	8.0E-07	N/A	2E-07
	Ra-226	9.0E-07	2.0E-07	2E-07
	Pb-210	2.9E-06	7.0E-07	1E-06
	Gross Alpha	ND	N/A	1E-05
North (maximally exposed member for the public)				
	U-Nat	6.0E-07	N/A	2E-07
	Ra-226	7.0E-07	1.0E-07	2E-07
	Pb-210	1.9E-06	5.0E-07	1E-06
	Gross Alpha	ND	N/A	1E-05
Met Station				
	U-Nat	1.2E-06	N/A	2E-07
	Ra-226	1.1E-06	2.0E-07	2E-07
	Pb-210	1.2E-06	4.0E-07	1E-06
	Gross Alpha	ND	N/A	1E-05
Southwest (Background)				
	U-Nat	8.0E-07	N/A	2E-07
	Ra-226	9.0E-07	2.0E-07	2E-07
	Pb-210	3.0E-06	5.0E-07	1E-06
	Gross Alpha	ND	N/A	1E-05
East				
	U-Nat	5.0E-07	N/A	2E-07
	Ra-226	5.0E-07	2.0E-07	2E-07
	Pb-210	ND	N/A	1E-06
	Gross Alpha	ND	N/A	1E-05
South				
	U-Nat	4.0E-07	N/A	2E-07
	Ra-226	5.0E-07	2.0E-07	2E-07
	Pb-210	1.8E-06	4.0E-07	1E-06
	Gross Alpha	ND	N/A	1E-05

N/A – Not Applicable, ND – Non-Detect

Table 5 – Sediment Sample Results, Annual 2016 (Collected October 10, 2016)

Location	Radionuclide	Concentration (µCi/g)	Error ±(µCi/g)	Reporting Limit (µCi/g)
SW-1				
	U-Nat	1.0E-06	N/A	2.0E-07
	Ra-226	8.0E-07	2.0E-07	2.0E-07
	Pb-210	ND	N/A	1.0E-06
	Th-230	6.0E-07	6.0E-07	2.0E-07
	Gross Alpha	ND	N/A	1.0E-05
SW-2				
	U-Nat	1.3E-06	N/A	2.0E-07
	Ra-226	6.0E-07	2.0E-07	2.0E-07
	Pb-210	ND	N/A	1.0E-06
	Th-230	6.0E-07	6.0E-07	2.0E-07
	Gross Alpha	ND	N/A	1.0E-05
SW-3				
	U-Nat	4.3E-06	N/A	2.0E-07
	Ra-226	1.2E-06	2.0E-07	2.0E-07
	Pb-210	4.5E-06	5.0E-07	1.0E-06
	Th-230	1.0E-06	1.0E-06	2.0E-07
	Gross Alpha	1.4E-05	1.4E-06	1.0E-05

N/A – Not Applicable, ND – Non-Detect

Table 6 - Private Water Supply Wells Inventory

SEO Permit Number	Strata Well ID	Mine Unit Perimeter Ring within 2 km	3Q16	4Q16
P103666W	TW02	MU1 & MU2	X	X
P132537W	CSWELL01	MU1 & MU2	X	X
P192896W	TWWELL03	MU1 & MU2	X	X
P205345W	PWSW 2	MU1 & MU2	X	X
P206432W	5368-43-12 SM	MU1 & MU2	N/A	1
P22582P	P22582P	MU2	X	X
P23418P	P23418P	MU2	1	1
P50883W	P50883W	MU1 & MU2	X	X
P55052P	P55052P	MU1 & MU2	3	3
P55053P	P55053P	MU1 & MU2	3	3
P55054P	P55054P	MU1 & MU2	3	3
P55055P	P55055P	MU1 & MU2	3	3
P7323P	P7323P	MU1 & MU2	3	3
P7324P	HBWELL03	MU1	X	X
P7326P	HBWELL04	MU1	X	X
P74302W	TW01	MU1 & MU2	X	X
P7430P	HBWELL05	MU1 & MU2	1	1
P7431P	P7431P	MU1	3	3
Unknown	DWWELL01	MU1 & MU2	X	X
Unknown	SBWELL02	MU2	X	X

Notes:

X - Sample Collected

1-3 - No sample collected due to:

1 - Well not functioning

2 - Missed sample

3 - Not in use/not found/replaced

N/A – not applicable, well P206432W was transferred to landowner in 4Q16

Table 7 – Private Supply Well Monitoring Results, 3Q and 4Q 2016

Sample Location	CSWELL01 (P132537W)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	1.2E-09	N/A	0.4	7.3E-09	N/A	2.4
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	4.0E-10	1.0E-10	0.7	3.0E-10	1.0E-10	0.5
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	1.0E-09	5.0E-10	10.0	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	1.8E-08	3.5E-09	N/A	2.5E-08	5.2E-09	N/A
Gross beta	2.3E-08	3.6E-09	N/A	2.5E-08	6.6E-09	N/A

Sample Location	DWWELL01					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	6.6E-09	N/A	2.2	3.5E-09	N/A	1.2
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	6.8E-09	3.0E-10	11.3	5.2E-09	3.0E-10	8.7
Ra-226 (suspended)	1.7E-09	2.0E-10	2.8	1.4E-09	1.0E-10	2.3
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	5.3E-09	6.0E-10	53.0	3.0E-09	6.0E-10	30.0
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	1.4E-09	5.0E-10	3.5	ND	N/A	N/A
Gross alpha	3.8E-08	5.5E-09	N/A	4.1E-08	6.8E-09	N/A
Gross beta	3.7E-08	4.2E-09	N/A	3.9E-08	6.8E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 7 – Private Supply Well Monitoring Results, 3Q and 4Q 2016 (Continued)

Sample Location	HBWELL03 (P7324P)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	1.4E-09	N/A	0.5	8.8E-10	N/A	0.3
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	5.0E-10	1.0E-10	0.8	4.0E-10	1.0E-10	0.7
Ra-226 (suspended)	ND	N/A	N/A	3.0E-10	1.0E-10	0.5
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	2.0E-09	5.0E-10	20.0
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	6.4E-08	6.0E-09	N/A	7.3E-09	3.2E-09	N/A
Gross beta	6.9E-08	4.6E-09	N/A	2.2E-08	6.4E-09	N/A

Sample Location	HBWELL04 (P7326P)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.4E-08	N/A	7.9	1.5E-08	N/A	4.9
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	2.0E-10	1.0E-10	0.3	2.0E-10	1.0E-10	0.3
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	1.6E-09	4.0E-10	16.0
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	3.2E-08	4.3E-09	N/A	1.2E-08	3.7E-09	N/A
Gross beta	3.5E-08	3.7E-09	N/A	1.9E-08	6.1E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 7 – Private Supply Well Monitoring Results, 3Q and 4Q 2016 (Continued)

Sample Location	P50883W					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A	2.0E-10	1.0E-10	0.3
Ra-226 (suspended)	ND	N/A	N/A	4.0E-10	1.0E-10	0.7
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	1.3E-09	7.0E-10	13.0	ND	N/A	N/A
Pb-210 (suspended)	3.6E-09	5.0E-10	36.0	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	8.6E-09	1.1E-09	21.5	ND	N/A	N/A
Gross alpha	6.3E-09	2.5E-09	N/A	ND	N/A	N/A
Gross beta	9.9E-09	3.7E-09	N/A	ND	N/A	N/A

Sample Location	TW01 (P74302W)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A	3.0E-10	1.0E-10	0.5
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	3.3E-08	4.7E-09	N/A	5.4E-09	2.9E-09	N/A
Gross beta	3.4E-08	4.0E-09	N/A	1.3E-08	5.6E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 7 – Private Supply Well Monitoring Results, 3Q and 4Q 2016 (Continued)

Sample Location	TW02 (P103666W)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	4.7E-10	N/A	0.2	2.0E-10	N/A	0.1
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	3.0E-10	1.0E-10	0.5	4.0E-10	1.0E-10	0.7
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	2.0E-10	1.0E-10	0.2
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	1.1E-09	5.0E-10	11.0
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	9.1E-09	2.7E-09	N/A	3.2E-09	2.7E-09	N/A
Gross beta	1.8E-08	3.5E-09	N/A	1.5E-08	6.3E-09	N/A

Sample Location	TWWELL03 (P192896W)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (suspended)	4.0E-09	2.0E-10	6.7	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	1.3E-09	4.0E-10	13.0	ND	N/A	N/A
Pb-210 (suspended)	4.0E-09	5.0E-10	40.0	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	2.6E-08	1.9E-09	65.0	ND	N/A	N/A
Gross alpha	5.0E-09	2.2E-09	N/A	4.3E-09	3.0E-09	N/A
Gross beta	ND	N/A	N/A	ND	N/A	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 7 – Private Supply Well Monitoring Results, 3Q and 4Q 2016 (Continued)

Sample Location	P22582P					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.4E-09	N/A	0.8	ND	N/A	N/A
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	8.8E-09	2.2E-09	N/A	ND	N/A	N/A
Gross beta	1.3E-08	3.1E-09	N/A	ND	N/A	N/A

Sample Location	SBWELL02					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.5E-09	N/A	0.8	ND	N/A	N/A
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (suspended)	ND	N/A	N/A	2.0E-10	1.0E-10	0.3
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	7.0E-09	1.8E-09	N/A	ND	N/A	N/A
Gross beta	1.7E-08	3.1E-09	N/A	1.5E-08	5.8E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 7 – Private Supply Well Monitoring Results, 3Q and 4Q 2016 (Continued)

Sample Location	PWSW 2 (P205345W)					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.0E-09	N/A	0.7	1.6E-09	N/A	0.5
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	5.0E-10	1.0E-10	0.8	5.0E-10	1.0E-10	0.8
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Gross alpha	8.2E-09	2.8E-09	N/A	2.1E-09	9.0E-10	N/A
Gross beta	ND	N/A	N/A	ND	N/A	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 8 – Water Sample Lower Limits of Detection and Effluent Concentration Values

Radionuclide	LLD (μCi/mL)	10CFR20, App B, Table 2 Effluent Conc. Water (μCi/mL)
Natural Uranium	2.0E-10	3.0E-07
Th-230	2.0E-10	1.0E-07
Ra-226	2.0E-10	6.0E-08
Po-210	1.0E-09	4.0E-08
Pb-210	1.0E-09	1.0E-08

Table 9 – Industrial Well Monitoring Results, 3Q and 4Q 2016

Location: 19XX18

Sample Date	7/18/2016		8/10/2016		9/14/2016		10/5/2016			
Parameter	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Avg. Conc. (µCi/mL)	% Eff. Conc.
Uranium (dissolved)	1.5E-10	N/A	9.5E-11	N/A	8.3E-11	N/A	7.3E-11	N/A	1.0E-10	0.0
Uranium (suspended)	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A	N/A
Ra-226 (dissolved)	3.7E-08	8.0E-10	3.9E-08	7.0E-10	3.0E-08	6.0E-10	4.4E-08	8.0E-10	3.7E-08	62.4
Ra-226 (suspended)	4.0E-10	1.0E-10	1.0E-09	1.0E-10	3.0E-10	1.0E-10	1.5E-09	2.0E-10	8.0E-10	1.3
Th-230 (dissolved)	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A	N/A
Th-230 (suspended)	ND	N/A	5.0E-10	2.0E-10	ND	N/A	3.0E-10	1.0E-10	4.0E-10	0.4
Pb-210 (dissolved)	9.9E-09	9.0E-10	6.8E-09	7.0E-10	5.4E-09	6.0E-10	ND	N/A	7.4E-09	73.7
Pb-210 (suspended)	6.6E-09	6.0E-10	6.1E-09	7.0E-10	1.6E-09	4.0E-10	1.6E-08	1.0E-09	7.5E-09	74.8
Po-210 (dissolved)	4.5E-09	8.0E-10	3.0E-09	7.0E-10	3.8E-09	8.0E-10	ND	N/A	3.8E-09	9.4
Po-210 (suspended)	1.8E-08	1.6E-09	1.6E-08	1.5E-09	8.8E-09	1.3E-09	8.9E-09	1.0E-09	1.3E-08	31.8
Gross alpha	2.8E-07	1.3E-08	1.8E-07	1.3E-08	2.9E-07	1.4E-08	2.2E-07	1.5E-08	2.4E-07	N/A
Gross beta	1.1E-07	5.6E-09	7.4E-08	8.0E-09	8.9E-08	5.4E-09	8.2E-08	8.5E-09	8.9E-08	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 9 – Industrial Well Monitoring Results, 3Q and 4Q 2016 (Continued)

Location: 22X-19

Sample Date	7/18/2016		8/10/2016		9/14/2016			
Parameter	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Conc (µCi/mL)	Uncertainty ±(µCi/mL)	Avg. Conc. (µCi/mL)	% Eff. Conc.
Uranium (dissolved)	2.7E-11	N/A	2.0E-11	N/A	1.9E-11	N/A	2.2E-11	0.0
Uranium (suspended)	ND	N/A	ND	N/A	ND	N/A	N/A	N/A
Ra-226 (dissolved)	2.0E-09	2.0E-10	2.8E-09	2.0E-10	2.3E-09	2.0E-10	2.4E-09	3.9
Ra-226 (suspended)	2.0E-10	1.0E-10	ND	N/A	ND	N/A	2.0E-10	0.3
Th-230 (dissolved)	ND	N/A	ND	N/A	ND	N/A	N/A	N/A
Th-230 (suspended)	ND	N/A	ND	N/A	ND	N/A	N/A	N/A
Pb-210 (dissolved)	ND	N/A	1.8E-09	5.0E-10	1.1E-09	4.0E-10	1.5E-09	14.5
Pb-210 (suspended)	2.5E-09	5.0E-10	1.5E-09	4.0E-10	1.4E-09	4.0E-10	1.8E-09	18.0
Po-210 (dissolved)	ND	N/A	ND	N/A	ND	N/A	N/A	N/A
Po-210 (suspended)	2.3E-09	6.0E-10	ND	N/A	ND	N/A	2.3E-09	5.8
Gross alpha	3.3E-08	4.6E-09	4.0E-08	6.3E-09	8.3E-09	1.0E-09	2.7E-08	N/A
Gross beta	1.3E-08	3.2E-09	1.5E-08	5.9E-09	ND	N/A	1.4E-08	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 10 – Surface Water Monitoring Results, 3Q and 4Q 2016

Sample Location	Oshoto Reservoir					
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*	4th Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	1.2E-08	N/A	4.0	1.0E-08	N/A	3.3
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (suspended)	ND	N/A	N/A	2.0E-10	1.0E-10	0.3
Th-230 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	1.1E-09	5.0E-10	11.0	1.0E-09	5.0E-10	10.0
Pb-210 (suspended)	1.8E-09	4.0E-10	18.0	ND	N/A	N/A
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	6.5E-09	1.0E-09	16.3	ND	N/A	N/A
Gross alpha	1.3E-08	N/A	N/A	9.6E-09	N/A	N/A
Gross beta	2.0E-08	N/A	N/A	1.6E-08	N/A	N/A

Sample Location	SW-3		
Parameter	3rd Quarter (µCi/mL)	Uncertainty (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	1.3E-08	N/A	4.4
Uranium (suspended)	ND	N/A	N/A
Ra-226 (dissolved)	ND	N/A	N/A
Ra-226 (suspended)	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A
Th-230 (suspended)	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A
Pb-210 (suspended)	1.1E-09	4.0E-10	11.0
Po-210 (dissolved)	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A
Gross alpha	ND	N/A	N/A
Gross beta	3.6E-08	N/A	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 8

N/A = Not Applicable; ND = Non-Detect

Table 11 - Processing Facility Air Particulate Effluent Results, 3Q and 4Q 2016

Sample Period	Radio-nuclide	Concentration (µCi/mL)	Error ±(µCi/mL)	Concentration (µCi/mL)	Error ±(µCi/mL)	Concentration (µCi/mL)	Error ±(µCi/mL)	Average Conc. (µCi/mL)	Net Average Conc. (µCi/mL)	Effluent Released (Ci)
		Ion Exchange Area		**Reverse Osmosis Area**		**Lab**				
3rd	U-Nat	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
Quarter	Th-230	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
4th	U-Nat									
Quarter	Th-230									
	Ra-226									
	Pb-210									

N/A = Not Applicable; ND = Non-Detect

Table 12 - Wellfield Air Particulate Effluent Results, Composite 3Q and 4Q 2016

Location	Sample Period	Radionuclide	Concentration (µCi/mL)	Error ±(µCi/mL)	Net Concentration (µCi/mL)	Effluent Released (Ci)
Header house 1		U-Nat				
		Th-230				
		Ra-226				
		Pb-210				
Header house 2		U-Nat				
		Th-230				
		Ra-226				
		Pb-210				
Header house 3		U-Nat				
		Th-230				
		Ra-226				
		Pb-210				
Header house 4		U-Nat				
		Th-230				
		Ra-226				
		Pb-210				

Table 13 - Processing Facility Radon Effluent Results, 3Q and 4Q 2016

Sample Date	Concentration Recovery (µCi/mL)	Uncertainty ±(µCi/mL)	Average Recovery Flow Rate for the Month (mLPM)	Concentration Injection (µCi/mL)	Uncertainty ±(µCi/mL)	Average Injection Flow Rate for the Month (mLPM)	Loss Term (µCi/minute)	Effluent Released (Ci)
7/25/2016	5.4E-05	1.1E-06	7.2E+06	5.2E-05	1.0E-06	6.9E+06	29	1.2
7/25/16 Duplicate	5.4E-05	1.1E-06	7.2E+06	5.2E-05	1.0E-06	6.9E+06	23	1.0
8/8/2016	5.7E-05	1.1E-06	7.1E+06	5.7E-05	1.1E-06	6.8E+06	15	0.6
8/8/16 Duplicate	5.8E-05	1.2E-06	7.1E+06	5.7E-05	1.1E-06	6.8E+06	23	1.0
9/26/2016	5.2E-05	1.0E-06	7.1E+06	5.1E-05	1.0E-06	6.8E+06	23	1.0
9/26/16 Duplicate	5.5E-05	1.1E-06	6.8E+06	5.3E-05	1.1E-06	6.8E+06	12	0.5
10/17/2016	5.5E-05	1.1E-06	6.9E+06	4.7E-05	9.4E-07	6.6E+06	70	3.0
10/17/16 Duplicate	5.1E-05	1.0E-06	6.9E+06	5.7E-05	1.1E-06	6.6E+06	-27	-1.2
11/18/2016	5.5E-05	1.1E-06	7.2E+06	5.5E-05	1.1E-06	7.0E+06	2	0.1
11/18/16 Duplicate	5.5E-05	1.1E-06	7.2E+06	5.3E-05	1.1E-06	7.0E+06	21	0.9
12/13/2016	6.0E-05	1.2E-06	7.0E+06	5.6E-05	1.1E-06	6.8E+06	40	1.7
12/13/16 Duplicate	4.5E-05	9.0E-07	7.0E+06	5.3E-05	1.1E-06	6.8E+06	-47	-2.0
							TOTAL	**7.7**

Loss Term = (Concentration * Avg. Flow Rate Recovery) - (Concentration Injection * Avg. Flow Rate Injection)

Table 14 – Radon Concentration in the Wellfield Results, 3Q and 4Q 2016

Location	3rd Quarter (µCi/mL)	Uncertainty ±(µCi/mL)	4th Quarter (µCi/mL)	Uncertainty ±(µCi/mL)	Annual Average Concentration by Location (µCi/mL)
Header house 1	6.7E-09	8.4E-10	5.3E-09	6.5E-10	5.3E-09
OZ-005	7.0E-08	1.3E-08	2.7E-08	4.9E-09	2.8E-08
OZ-054	8.2E-08	1.5E-08	3.0E-07*	N/A	9.6E-08
OZ-057	3.4E-07*	N/A	2.8E-07	5.6E-08	1.6E-07
Header house 2	8.1E-09	1.0E-09	9.9E-09	1.2E-09	9.3E-09
OZ-018	2.0E-09	2.8E-10	1.6E-09	2.2E-10	1.9E-09
OZ-160	4.6E-10	1.1E-10	6.5E-10	1.1E-10	1.1E-09
OZ-170	7.3E-10	1.4E-10	9.2E-10	1.4E-10	1.6E-09
Header house 3	7.3E-09	8.7E-10	8.4E-09	1.0E-09	8.2E-09
OZ-215	1.2E-09	1.7E-10	2.4E-09	3.0E-10	1.9E-09
OZ-262	1.4E-09	1.9E-10	4.1E-09	4.9E-10	2.7E-09
OZ-199	1.9E-09	2.5E-10	2.6E-09	3.3E-10	2.3E-09
Header house 4	4.6E-09	5.7E-10	3.9E-09	4.9E-10	4.3E-09
OZ-291	9.2E-10	1.7E-10	8.1E-10	1.1E-10	8.7E-10
OZ-267	4.6E-10	1.1E-10	N/A	N/A	4.6E-10
OZ-305	8.6E-11	1.7E-10	1.8E-09	2.5E-10	9.4E-10
DDW	4.6E-10	1.1E-10	6.5E-10	1.1E-10	4.0E-10

Note: The radon for 3rd quarter OZ-057 and 4th quarter OZ-054 detectors were reported by the contract laboratory as greater than values since reportable results could not be provided due to the exposure to the detectors. Therefore, the annual average concentration was based on the reported concentration.

Table 15 – Wellfield Radon Effluent Results, 3Q and 4Q 2016

Location	Average Concentration (µCi/mL)	Net Average Concentration (µCi/mL)	Effluent Released per Location (µCi)	Number of Recovery Wells	Effluent Released (Ci)
Header house 1 Recovery Wells	9.4E-08	9.3E-08	1.1E+02	29	3.0E-03
Header house 2 Recovery Wells	1.5E-09	8.4E-10	7.6E-01	30	2.3E-05
Header house 3 Recovery Wells	2.3E-09	1.6E-09	8.0E-01	30	2.4E-05
Header house 4 Recovery Wells	7.6E-10	7.6E-11	3.9E-02	17	6.5E-07
Header house 1	5.3E-09	4.6E-09	2.5E+04	N/A	2.5E-02
Header house 2	9.3E-09	8.6E-09	3.7E+04	N/A	3.7E-02
Header house 3	8.2E-09	7.6E-09	1.7E+04	N/A	1.7E-02
Header house 4	4.3E-09	3.6E-09	8.6E+03	N/A	8.6E-03
				Total (Ci):	**9.1E-02**

N/A = Not Applicable
Background is 6.8E-10 µCi/mL

Table 16 - Unplanned Releases Radon Effluent Results, 3Q and 4Q 2016

Spill Date	Process Fluid Type	Spill Volume (mL)	Rn-222 Concentration (µCi/mL)	Effluent Released (Ci)
7/19/2016	Injection	6.1E+06	1.1E-06	6.7E-06
10/12/2016	Injection	3.8E+06	1.1E-06	4.2E-06
			TOTAL	**1.1E-05**

Table 17 – Total Air Particulate Effluent

Radionuclide	Plant Effluent (Ci)	Wellfield Effluent (Ci)	Total Effluent (Ci)
U-Nat			
Th-230			
Ra-226			
Pb-210			