STRATA ENERGY INC

A WHOLLY-OWNED SUBSIDIARY OF PENINSULA ENERGY LIMITED

August 31, 2018

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
January - June 2018 Semi-Annual Effluent Report

To Whom it May Concern,

Strata Energy, Inc. (Strata) hereby submits this Semi-Annual Report for the period of January 1, 2018 through June 30, 2018. This report satisfies the requirements of 10 CFR 40.65 and the applicable license conditions of Source Materials License SUA-1601.

If you have any questions regarding the provided information, please contact me at (307) 467-9375 or by email at rpond@stratawyo.com.

Sincerely,
STRATA ENERGY INC.

Royal Pond
Manager HSE/RSO

cc: Ben Schiffer, WWC Engineering

Attachments: January - June 2018 Semi-Annual Report

IE25
IE48
NMSS01
NMSS

STRATA ENERGY INC

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Strata Energy, Inc.

Ross ISR Project

Source Materials License Number SUA-1601

Docket Number 040-09091

Semi-Annual Effluent and Environmental Monitoring Report

January 1 – June 30, 2018

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APPENDICES

1 INTRODUCTION

Pursuant to 10 CFR 40.65 and Source Materials License SUA-1601, Strata Energy, Inc. (Strata) has prepared this Semi-Annual Report, which summarizes the operational and environmental activities at the Ross ISR Project. The report includes that information required by License Condition 11.1 and 11.2, as applicable. This report covers the time period from January 1 – June 30, 2018.

1.1 ACTIVITIES SUMMARY

Strata commenced uranium recovery operations at the Ross ISR 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 ISR Project are analogous to an ISR satellite facility.

Currently (through June 30, 2018) two wellfields, Mine Units 1 and 2 (MU1 and MU2), 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 ISR 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 ISR 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. During reporting period, minor repairs to equipment were completed. The inspection reports are available at the Ross ISR Project.

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

3.1 INSPECTION SUMMARY

An annual inspection of the lined retention pond was conducted on June 27, 2018 by WWC Engineering. The report of the inspection is provided in Appendix B.

4 LICENSE CONDITION 11.1(C) – OPERATIONAL MONITORING

4.1 STATUS OF WELLFIELDS IN OPERATION

There are currently (through December 31, 2017) two wellfields in operation, MU1 and MU2. There are currently four header houses in operation in MU1 and six header houses in operation in MU2. 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
MU1	1	01-Dec-15	01-Dec-15 (recirculated through the plant)
	2	27-Jan-16	19-Feb-16
	3	20-Apr-16	16-May-16
	4	09-Jun-16	21-Jun-16
MU2	5	30-Sept-16	27-Dec-16
	6	28-Dec-16	9-Feb-17
	7	21-Feb-17	9-May-17
	8	2-Jun-17	13-Jul-17
	9	15-Aug-17	4-Oct-17
	10	12-Jun-18	1-Aug-18

4.2 PROGRESS OF WELLFIELDS IN RESTORATION

There are no wellfields in restoration at the Ross ISR Project.

4.3 STATUS OF LONG TERM EXCURSIONS

No excursions have occurred at the Ross ISR Project.

4.4 SUMMARY OF MECHANICAL INTEGRITY TESTS

4.4.1 First Quarter

Three (3) MU1 wells located in Section 7, T53N, R67W and two (2) MU1 wells located in Section 18, T53N, R67W passed mechanical integrity testing (MIT) during the first quarter. Twenty (20) MU2 wells located in Section 18, T53N, R67W and two (2) MU2 wells located in Section 13, T53N, R68W passed MIT during the first quarter.

4.4.2 Second Quarter

Two (2) MU1 wells located in Section 7, T53N, R67W and seven (7) MU1 wells located in Section 18, T53N, R67W passed MIT during the second quarter. One (1) MU2 well located in Section 7, T53N, R67W, twenty-eight (28) MU2 wells located in Section 18, T53N, R67W and three (3) MU2 wells located in Section 13, T53N, R68W passed MIT during the second quarter. One MU2 well (MU2-OZ486) failed MIT and is currently being repaired.

5 LICENSE CONDITION 11.1(D) – ENVIRONMENTAL MONITORING

Source Materials 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 ISR Project.

During the reporting period, Strata operated five 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 NRC Regulatory Guide 4.14 and are discussed in detail in 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 at the site where the meteorological station was previously operated.
- "Southwest" – This location is southwest and upwind of the CPP and wellfields. Per TR Section 2.9.2.4, this is the designated "background location."
- "East" – This location is east of the CPP.
- "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 was conducted at the five environmental monitoring stations discussed above. Air filters were collected bi-weekly, or more often as required by dust loading, and composited for analysis on a quarterly basis. The filters were sent to an accredited contract laboratory for analysis for total uranium, Ra-226, Th-230, and Pb-210.

The results from the air particulate monitoring are summarized in Appendix A, Table 1. The appropriate values from 10 CFR 20, Appendix B, Table 2, Effluent Concentration Limits are also provided in this table for comparison along with the appropriate lower limits of detection (LLDs). The LLDs met the specifications in NRC 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, 2016, and 2017. There is no evidence of any impacts from the current operations.

5.2 DIRECT RADIATION

Strata conducts a direct radiation monitoring program to monitor the direct radiation levels at the environmental monitoring stations described above. The direct radiation levels were measured using LANDAUER® InLight® optical stimulated luminescence (OSL) dosimeters. The OSL dosimeters are exchanged quarterly and sent to LANDAUER®, an NVLAP-accredited company, for analysis. The direct radiation monitoring program was conducted according to 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 direct radiation monitoring program for the reporting period is included in Appendix A, Table 2. Data are 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, 2016, and 2017. There is no evidence of any impacts from the current operations.

5.3 RADON

Strata conducts continuous monitoring for radon gas in accordance with TR Section 5.7.7.1.1 and NRC Regulatory Guide 4.14, Section 2.1.2. The radon gas was measured using LANDAUER® high sensitivity environmental radon alpha-track detectors. The detectors were exchanged quarterly and sent to Radonova for analysis. The detectors were placed at the 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, 2016, and 2017. There is no evidence of any impacts from the current operations.

5.4 GROUNDWATER

5.4.1 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. Samples are sent to an accredited contract laboratory for analysis of 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 4.

Seventeen private water supply wells were within 2 kilometers of the monitor well ring for MU1 (14 of which were also within 2 kilometers of the monitor well ring for MU2), and an additional 3 private water supply wells were within 2 kilometers of the monitor well ring for MU2 only during the reporting period.

Two wells (P206432W and P23418P) were not sampled during the reporting period as the pump infrastructure has not been maintained to suitable standards for obtaining a sample. 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 canceled. At the landowners request, wells SBWELL02 and TWWELL03 (first quarter only) were not sampled during the reporting period. In addition, wells P22582P, P50883W, HBWELL03, and HBWELL04 were not functioning in the first quarter and well HBWELL05 was not functioning in the second quarter.

A summary of the results from the monitoring for the reporting period are included in Appendix A, Table 5. The LLDs and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide of interest are included in Appendix A, Table 6.

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, 2016, and 2017. There is no evidence of any impacts from the current operations.

5.4.2 Industrial Wells

Strata monitors the groundwater quality of two industrial wells (19XX18 and 22X-19) used for oil field water flood purposes in accordance with License Condition 10.19 and 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. The samples were sent to an accredited contract laboratory for analysis of dissolved and suspended uranium, Ra-226, Th-230, Pb-210, Po-210, gross alpha, and gross beta.

During the reporting period, industrial well 19XX18 was inoperable. Well 22X-19 was sampled January through June. A summary of the results from the monitoring for the reporting period are included in Appendix A, Table 7. The LLDs and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide are included in Appendix A, Table 6.

A review of the results indicates that 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 this well is natural, since it is completed in the mineralized formation. There is no evidence of any impacts from ISR activities at the Ross ISR Project.

5.5 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.

Strata obtained quarterly grab water samples from site R-2 during the reporting period, as recommended in Regulatory Guide 4.14. Grab samples were also collected from the three surface water stations in the first quarter and site SW-3 in the second quarter. The results are included in Appendix A, Table 8. The LLDs and the 10 CFR 20, Appendix B, Table 2 value for each radionuclide are included in Appendix A, Table 6.

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, 2016, and 2017. There is no evidence of any impacts from the current operations.

5.6 POND MONITORING WELLS

License Condition 10.20 requires Strata to conduct a groundwater detection monitoring program for the lined 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). Throughout the reporting period, Strata collected quarterly samples from the pond monitoring wells. The samples were analyzed for total alkalinity, chloride, and electrical conductivity. All concentrations were below the action levels established by the Strata SERP (SERP 17-3).

5.7 FRENCH DRAIN AND LINED RETENTION POND UNDERDRAIN

As part of the initial CPP area construction activities, a containment barrier wall (CBW) with associated French drain were installed to the south of the CPP and the lined retention pond 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 2,095 gallons per day (gpd) for the first quarter and 2,253 gpd for the second quarter. The flow rate for the lined retention pond underdrain averaged 3,146 gpd for the first quarter and 2,500 gpd for the second quarter. The lined retention pond underdrain flow rates were higher than those estimated in the Ross TR (26 to 28 gpd), which 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 uranium, Ra-226, Pb-210, and Th-230. 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, displayed in Appendix A, Table 9, show that all of the concentrations were non-detect for the first and second quarters. Beginning in the third quarter of 2016, the contract laboratory changed the reporting limits based on the 10 CFR Part 20 Occupational Limits. The uranium, Ra-226, and Th-230 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 ISR Project. Therefore, monthly air particulate samples are obtained from each header house and submitted as a composite sample to an outside accredited laboratory. For the reporting period, the composite samples were submitted quarterly

and analyzed for uranium, Ra-226, Pb-210, and Th-230. The results were averaged to determine the average concentration of air particulates in the header houses. This average concentration was 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. The results, displayed in Appendix A, Table 10, show that all results were non-detect for the regulatory period. Beginning in the third quarter of 2016, the contract laboratory changed the reporting limits based on the 10 CFR Part 20 Occupational Limits. The uranium, Ra-226, and Th-230 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.

6.2 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 that 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 compared to the injection portion is being released inside the plant and subsequently exhausted to the outside.

The quarterly loss term was calculated using the quarterly injection and recovery solution radon-222 concentration and the average injection and recovery fluid flow rates during the quarter.

A summary of the results for the monitoring period are displayed in Appendix A, Table 11. Duplicate samples were collected but not included in the table or used to determine the total quantity of effluent released during the reporting period. The results for the reporting period are consistent with 2016 and 2017 results (i.e., all less than 10 Ci per month released), 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, alpha-track 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 ventilation rate of the header houses is 9.5E6 mL/minute (two fans at 4.7E6 mL/minute each).

A summary of the results from the monitoring period are displayed in Appendix A, Table 12. The total semi-annual effluent release estimates are displayed in Appendix A, Table 13.

6.2.3 Unplanned Releases

There were no reportable unplanned releases at the Ross ISR Project during the reporting period.

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 3.8E-10 µCi/mL. This background value was not subtracted from the concentrations of effluent found in the processing facility, since the concentrations were measured in 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 regard to unplanned releases is also not appropriate, since the release is calculated based on 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 from wellfield effluents displayed by the net average concentrations in Appendix A, Table 13.

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 or wellfield results, since all of the results were non-detect for the reporting period (Appendix A, Table 9 and Table 10).

6.4 TOTAL QUANTITIES RELEASED

The three sources of effluent at the Ross ISR Project have been identified as the processing facility, the wellfield, and any unplanned releases of process fluids.

6.4.1 Quantity of Air Particulate Effluent

The quantity of effluent released in the form of air particulates is summarized in Appendix A, Table 14. Due to the change in the contract laboratory reporting limit, described in Sections 6.1.1 and 6.1.2, all results were non-detect.

6.4.2 Quantity of Radon and Radon Progeny Effluent

The 1st Half 2018 Rn-222 effluent released from the plant is calculated as 1.0 Ci. The 1st Half 2018 Rn-222 effluent released from the wellfields is calculated as 8.9E-02 Ci. There was no effluent released from unplanned releases. The summation of the three sources of effluent yields a total quantity of Rn-222 effluent released of 1.1 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 TR Section 7.3, which states: "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."

The lack of effluent in the form of particulates is demonstrated by the non-detect concentrations reported.

Regarding the quantity of Rn-222 effluent, 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 far below what was estimated in the approved license application.

Appendix A

Tables

Table 1 - Environmental Air Particulates Monitoring Results, 1Q and 2Q 2018

Location	Sample Period	Radionuclide	Concentration (µCi/mL)	Error ± (µCi/mL)	LLD (µCi/mL)	10 CFR 20, App. B Table 2 Values (µCi/mL)	Percent Effluent Conc. Value (%)
Oshoto							
	1st Quarter	Uranium	3.3E-16	N/A	1E-16	9E-13	0.0
		Th-230	1.6E-16	9.7E-17	1E-16	2E-14	0.8
		Ra-226	1.2E-16	2.4E-17	1E-16	9E-13	0.0
		Pb-210	1.3E-14	1.0E-15	2E-15	6E-13	2.2
	2nd Quarter	Uranium	1.7E-16	N/A	1E-16	9E-13	0.0
		Th-230	1.8E-16	8.5E-17	1E-16	2E-14	0.9
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	9.6E-15	9.3E-16	2E-15	6E-13	1.6
North (maximally exposed member of the public)							
	1st Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	ND	N/A	1E-16	2E-14	N/A
		Ra-226	2.7E-16	6.1E-17	1E-16	9E-13	0.0
		Pb-210	1.8E-14	1.3E-15	2E-15	6E-13	3.0
	2nd Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	6.3E-16	2.0E-16	1E-16	2E-14	3.2
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	1.1E-14	9.9E-16	2E-15	6E-13	1.8
Met Station							
	1st Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	4.4E-16	2.8E-16	1E-16	2E-14	2.2
		Ra-226	1.2E-16	3.1E-17	1E-16	9E-13	0.0
		Pb-210	1.9E-14	1.1E-15	2E-15	6E-13	3.2
	2nd Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	1.2E-16	5.7E-17	1E-16	2E-14	0.6
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	1.1E-14	1.0E-15	2E-15	6E-13	1.8

N/A – Not Applicable, ND – Non-Detect

Table 1 - Environmental Air Particulates Monitoring Results, 1Q and 2Q 2018 (Continued)

Location	Sample Period	Radionuclide	Concentration (µCi/mL)	Error ± (µCi/mL)	LLD (µCi/mL)	10 CFR 20, App. B Table 2 Values (µCi/mL)	Percent Effluent Conc. Value (%)
Southwest (Background)							
	1st Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	9.4E-15	1.9E-15	1E-16	2E-14	47.0
		Ra-226	2.0E-16	5.1E-17	1E-16	9E-13	0.0
		Pb-210	1.8E-14	9.7E-16	2E-15	6E-13	3.0
	2nd Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	4.9E-16	1.4E-16	1E-16	2E-14	2.5
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	1.2E-14	9.6E-16	2E-15	6E-13	2.0
East							
	1st Quarter	Uranium	2.5E-16	N/A	1E-16	9E-13	0.0
		Th-230	1.2E-16	7.3E-17	1E-16	2E-14	0.6
		Ra-226	2.5E-16	7.3E-17	1E-16	9E-13	0.0
		Pb-210	1.1E-14	9.8E-16	2E-15	6E-13	1.8
	2nd Quarter	Uranium	ND	N/A	1E-16	9E-13	N/A
		Th-230	3.6E-16	1.2E-16	1E-16	2E-14	1.8
		Ra-226	ND	N/A	1E-16	9E-13	N/A
		Pb-210	1.1E-14	8.9E-16	2E-15	6E-13	1.8

N/A – Not Applicable, ND – Non-Detect

Table 2 - Environmental Direct Radiation Monitoring Results, 1Q and 2Q 2018

Location	1st Quarter Gross (mrem/quarter)	2nd Quarter Gross (mrem/quarter)	Semi-Annual Location Average (mrem/quarter)
Oshoto	44.1	37.7	40.9
North (maximally exposed member of the public)	40.7	36.1	38.4
Met Station	50.8	39.1	45.0
Southwest (Background)	38.2	36.2	37.2
East	43.7	34.2	39.0

Table 3 - Environmental Radon in Air Results, 1Q and 2Q 2018

Location	1st Quarter (µCi/mL)	Error ± (µCi/mL)	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	Semi-Annual Location Average (µCi/mL)	10 CFR 20, App. B Table 2 Value (µCi/mL)	Percent Effluent Conc. Value (%)
Oshoto	4.6E-10	9.0E-11	3.5E-10	1.1E-10	4.1E-10	1E-10	405
North (maximally exposed member of the public)	4.1E-10	9.0E-11	4.9E-10	1.4E-10	4.5E-10	1E-10	450
Met Station	4.1E-10	9.0E-11	3.0E-10	1.1E-10	3.6E-10	1E-10	355
Southwest (Background)	4.3E-10	1.1E-10	3.2E-10	1.1E-10	3.8E-10	1E-10	375
East	6.2E-10	1.1E-10	1.4E-10	1.1E-10	3.8E-10	1E-10	380

Table 4 - Private Water Supply Wells Inventory

SEO Permit Number	Strata Well ID	Mine Unit Perimeter Ring within 2 km	1Q18	2Q18
P103666W	TW02	MU1 & MU2	X	X
P132537W	CSWELL01	MU1 & MU2	X	X
P192896W	TWWELL03	MU1 & MU2	3	1
P205345W	PWSW 2	MU1 & MU2	X	X
P206432W	5368-43-12 SM	MU1 & MU2	1	1
P22582P	P22582P	MU2	1	X
P23418P	P23418P	MU2	1	1
P50883W	P50883W	MU1 & MU2	1	X
P55052P	P55052P	MU1 & MU2	2	2
P55053P	P55053P	MU1 & MU2	2	2
P55054P	P55054P	MU1 & MU2	2	2
P55055P	P55055P	MU1 & MU2	2	2
P7323P	P7323P	MU1 & MU2	2	2
P7324P	HBWELL03	MU1	1	X
P7326P	HBWELL04	MU1	1	X
P74302W	TW01	MU1 & MU2	X	X
P7430P	HBWELL05	MU1 & MU2	X	1
P7431P	P7431P	MU1	2	2
Unknown	DWWELL01	MU1 & MU2	X	X
Unknown	SBWELL02	MU2	3	3

Notes:

X - Sample Collected

1-3 - No sample collected due to:

1 - Well not functioning

2 - Not in use/not found/replaced

3 - Landowner request

Table 5 - Private Supply Well Monitoring Results, 1Q and 2Q 2018

Sample Location	TW02 (P103666W)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.7E-10	N/A	0.1	1.4E-09	N/A	0.5
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	2.5E-09	2.0E-10	4.2	1.0E-09	1.0E-10	1.7
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	1.2E-09	3.0E-10	1.2
Th-230 (suspended)	ND	N/A	N/A	3.0E-10	1.0E-10	0.3
Pb-210 (dissolved)	ND	N/A	N/A	1.4E-09	3.0E-10	14.0
Pb-210 (suspended)	ND	N/A	N/A	2.8E-09	3.0E-10	28.0
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	ND	N/A	N/A	7.3E-09	1.2E-09	18.3
Gross alpha	7.6E-09	3.7E-09	N/A	ND	N/A	N/A
Gross beta	2.0E-08	6.3E-09	N/A	1.7E-08	5.9E-09	N/A

Sample Location	CSWELL01 (P132537W)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.1E-09	N/A	0.7	7.2E-09	N/A	2.4
Uranium (suspended)	2.7E-10	N/A	0.1	ND	N/A	N/A
Ra-226 (dissolved)	3.0E-09	2.0E-10	5.0	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	1.0E-09	3.0E-10	1.0
Th-230 (suspended)	ND	N/A	N/A	1.0E-09	3.0E-10	1.0
Pb-210 (dissolved)	ND	N/A	N/A	1.3E-09	3.0E-10	13.0
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)	1.3E-09	5.0E-10	3.3	ND	N/A	N/A
Gross alpha	7.8E-09	2.2E-09	N/A	1.3E-08	4.1E-09	N/A
Gross beta	1.3E-08	3.0E-09	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 6

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

Table 5 - Private Supply Well Monitoring Results, 1Q and 2Q 2018 (Continued)

Sample Location	PWSW 2 (P205345W)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	1.8E-09	N/A	0.6	3.0E-09	N/A	1.0
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	7.0E-10	1.0E-10	1.2	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	1.4E-09	5.0E-10	1.4
Pb-210 (dissolved)	ND	N/A	N/A	1.8E-09	3.0E-10	18.0
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	1.2E-08	3.5E-09	N/A	9.9E-09	4.7E-09	N/A
Gross beta	2.0E-08	5.7E-09	N/A	1.5E-08	6.0E-09	N/A

Sample Location	P22582P					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	No Sample – Well Not Functioning			1.4E-09	N/A	0.5
Uranium (suspended)				ND	N/A	N/A
Ra-226 (dissolved)				2.0E-10	1.0E-10	0.3
Ra-226 (suspended)				ND	N/A	N/A
Th-230 (dissolved)				2.8E-10	1.0E-10	0.3
Th-230 (suspended)				ND	N/A	N/A
Pb-210 (dissolved)				2.8E-09	4.0E-10	28.0
Pb-210 (suspended)				1.3E-09	3.0E-10	13.0
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				1.4E-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 6

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

Table 5 - Private Supply Well Monitoring Results, 1Q and 2Q 2018 (Continued)

Sample Location	P50883W					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	No Sample – Well Not Functioning			1.2E-09	N/A	0.4
Uranium (suspended)				2.0E-10	N/A	0.1
Ra-226 (dissolved)				2.0E-10	1.0E-10	0.3
Ra-226 (suspended)				1.7E-09	1.0E-10	2.8
Th-230 (dissolved)				3.1E-09	5.0E-10	3.1
Th-230 (suspended)				1.9E-09	5.0E-10	1.9
Pb-210 (dissolved)				1.1E-09	4.0E-10	11.0
Pb-210 (suspended)				1.8E-09	3.0E-10	18.0
Po-210 (dissolved)				ND	N/A	N/A
Po-210 (suspended)				2.5E-09	8.0E-10	6.3
Gross alpha				5.7E-09	3.0E-09	N/A
Gross beta				ND	N/A	N/A

Sample Location	HBWELL03 (P7324P)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	No Sample – Well Not Functioning			2.5E-09	N/A	0.8
Uranium (suspended)				ND	N/A	N/A
Ra-226 (dissolved)				9.0E-10	1.0E-10	1.5
Ra-226 (suspended)				2.0E-10	1.0E-10	0.3
Th-230 (dissolved)				1.3E-09	4.0E-10	1.3
Th-230 (suspended)				2.0E-10	1.0E-10	0.2
Pb-210 (dissolved)				ND	N/A	N/A
Pb-210 (suspended)				1.2E-09	3.0E-10	12.0
Po-210 (dissolved)				ND	N/A	N/A
Po-210 (suspended)				ND	N/A	N/A
Gross alpha				5.6E-09	3.0E-09	N/A
Gross beta				2.6E-08	5.9E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 6

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

Table 5 - Private Supply Well Monitoring Results, 1Q and 2Q 2018 (Continued)

Sample Location	HBWELL04					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	No Sample – Well Not Functioning			2.1E-08	N/A	7.0
Uranium (suspended)				9.5E-10	N/A	0.3
Ra-226 (dissolved)				6.0E-10	1.0E-10	1.0
Ra-226 (suspended)				4.0E-10	1.0E-10	0.7
Th-230 (dissolved)				4.0E-10	2.0E-10	0.4
Th-230 (suspended)				ND	N/A	N/A
Pb-210 (dissolved)				2.0E-09	3.0E-10	20.0
Pb-210 (suspended)				ND	N/A	N/A
Po-210 (dissolved)				ND	N/A	N/A
Po-210 (suspended)				ND	N/A	N/A
Gross alpha				1.0E-08	3.2E-09	N/A
Gross beta				2.3E-08	6.2E-09	N/A

Sample Location	TW01 (P74302W)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	ND	N/A	N/A	1.2E-09	N/A	0.4
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	1.2E-09	1.0E-10	2.0	6.0E-10	1.0E-10	1.0
Ra-226 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Th-230 (dissolved)	ND	N/A	N/A	1.3E-09	5.0E-10	1.3
Th-230 (suspended)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (dissolved)	ND	N/A	N/A	1.3E-09	3.0E-10	13.0
Pb-210 (suspended)	1.0E-09	3.0E-10	10.0	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	3.5E-09	1.0E-09	N/A	ND	N/A	N/A
Gross beta	6.1E-09	1.5E-09	N/A	1.9E-08	5.5E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 6

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

Table 5 - Private Supply Well Monitoring Results, 1Q and 2Q 2018 (Continued)

Sample Location	HBWELL05 (P7430P)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	9.8E-09	N/A	3.3	No Sample – Well Not Functioning		
Uranium (suspended)	ND	N/A	N/A			
Ra-226 (dissolved)	2.4E-09	2.0E-10	4.0			
Ra-226 (suspended)	ND	N/A	N/A			
Th-230 (dissolved)	2.0E-10	2.0E-10	0.2			
Th-230 (suspended)	ND	N/A	N/A			
Pb-210 (dissolved)	ND	N/A	N/A			
Pb-210 (suspended)	1.6E-09	3.0E-10	16.0			
Po-210 (dissolved)	ND	N/A	N/A			
Po-210 (suspended)	ND	N/A	N/A			
Gross alpha	1.8E-08	3.7E-09	N/A			
Gross beta	1.5E-08	6.1E-09	N/A			

Sample Location	DWWELL01					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	4.3E-09	N/A	1.4	7.2E-09	N/A	2.4
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	8.9E-09	3.0E-10	14.8	1.9E-09	2.0E-10	3.2
Ra-226 (suspended)	7.6E-09	3.0E-10	12.7	3.6E-09	2.0E-10	6.0
Th-230 (dissolved)	ND	N/A	N/A	2.8E-10	1.0E-10	0.3
Th-230 (suspended)	ND	N/A	N/A	8.0E-10	3.0E-10	0.8
Pb-210 (dissolved)	ND	N/A	N/A	2.4E-09	3.0E-10	24.0
Pb-210 (suspended)	3.3E-09	4.0E-10	33.0	5.1E-09	4.0E-10	51.0
Po-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Po-210 (suspended)	4.0E-09	9.0E-10	10.0	2.7E-09	7.0E-10	6.8
Gross alpha	1.0E-08	1.2E-09	N/A	5.8E-08	7.5E-09	N/A
Gross beta	1.2E-08	1.6E-09	N/A	6.1E-08	7.8E-09	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 6

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

Table 6 - Water Sample Lower Limits of Detection and Effluent Concentration Values

Radionuclide	LLD (μCi/mL)	10 CFR 20, App. B, Table 2 Effluent Conc. Water (μCi/mL)
Uranium	2.0E-10	3.0E-07
Ra-226	2.0E-10	6.0E-08
Th-230	2.0E-10	1.0E-07
Pb-210	1.0E-09	1.0E-08
Po-210	1.0E-09	4.0E-08

Table 7 - Industrial Well Monitoring Results, 1Q and 2Q 2018

Location: 22X-19								
Sample Date	1/23/18		2/27/18		3/28/18			
Parameter	Conc. (µCi/mL)	Error ± (µCi/mL)	Conc. (µCi/mL)	Error ± (µCi/mL)	Conc. (µCi/mL)	Error ± (µCi/mL)		
Uranium, dissolved	1.5E-08	N/A	1.1E-08	N/A	1.6E-08	N/A		
Uranium, suspended	ND	N/A	3.4E-10	N/A	ND	N/A		
Ra-226, dissolved	2.6E-09	3.0E-10	3.5E-09	2.0E-10	2.9E-09	2.0E-10		
Ra-226, suspended	2.0E-10	1.0E-10	9.0E-10	1.0E-10	5.0E-10	1.0E-10		
Th-230, dissolved	ND	N/A	ND	N/A	ND	N/A		
Th-230, suspended	ND	N/A	ND	N/A	ND	N/A		
Pb-210, dissolved	ND	N/A	1.2E-09	3.0E-10	ND	N/A		
Pb-210, suspended	1.4E-09	3.0E-10	ND	N/A	1.6E-09	3.0E-10		
Po-210, dissolved	ND	N/A	ND	N/A	ND	N/A		
Po-210, suspended	2.0E-09	7.0E-10	ND	N/A	ND	N/A		
Gross Alpha	7.6E-08	7.7E-09	3.9E-08	5.7E-09	3.5E-08	6.0E-09		
Gross Beta	5.0E-08	7.1E-09	1.4E-08	5.3E-09	2.0E-08	6.2E-09		
Sample Date	4/25/18		5/30/18		6/20/18		Avg. Conc. (µCi/mL)	% Eff. Conc.*
Parameter	Conc. (µCi/mL)	Error ± (µCi/mL)	Conc. (µCi/mL)	Error ± (µCi/mL)	Conc. (µCi/mL)	Error ± (µCi/mL)		
Uranium, dissolved	1.4E-08	N/A	1.5E-08	N/A	1.5E-08	N/A	1.4E-08	4.8
Uranium, suspended	ND	N/A	ND	N/A	ND	N/A	3.4E-10	0.1
Ra-226, dissolved	3.3E-09	2.0E-10	3.2E-09	2.0E-10	3.4E-09	2.0E-10	3.2E-09	5.3
Ra-226, suspended	1.9E-08	5.0E-10	ND	N/A	6.0E-10	1.0E-10	4.3E-09	7.2
Th-230, dissolved	ND	N/A	ND	N/A	7.0E-10	2.0E-10	7.0E-10	0.7
Th-230, suspended	ND	N/A	1.1E-09	3.0E-10	ND	N/A	1.1E-09	1.1
Pb-210, dissolved	ND	N/A	ND	N/A	ND	N/A	1.2E-09	12.0
Pb-210, suspended	1.5E-09	3.0E-10	1.4E-09	8.0E-10	ND	N/A	1.5E-09	14.8
Po-210, dissolved	1.5E-09	1.5E-09	ND	N/A	ND	N/A	1.5E-09	3.8
Po-210, suspended	1.8E-09	1.0E-09	1.8E-09	9.0E-10	1.6E-09	5.0E-10	1.8E-09	4.5
Gross Alpha	3.5E-08	4.5E-09	2.9E-08	4.9E-09	4.4E-08	6.5E-09	4.3E-08	N/A
Gross Beta	1.7E-08	3.3E-09	ND	N/A	2.5E-08	6.3E-09	2.5E-08	N/A

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 6
N/A = Not Applicable; ND = Non-Detect

Table 8 - Surface Water Monitoring Results, 1Q and 2Q 2018

Sample Location	R-2 (Oshoto Reservoir)					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	2.2E-09	N/A	0.7	1.0E-08	N/A	3.5
Uranium (suspended)	ND	N/A	N/A	4.1E-10	N/A	0.1
Ra-226 (dissolved)	8.0E-10	1.0E-10	1.3	1.0E-09	1.0E-10	1.7
Ra-226 (suspended)	ND	N/A	N/A	4.0E-10	1.0E-10	0.7
Th-230 (dissolved)	ND	N/A	N/A	1.9E-09	3.0E-10	1.9
Th-230 (suspended)	ND	N/A	N/A	6.0E-10	2.0E-10	0.6
Pb-210 (dissolved)	ND	N/A	N/A	6.7E-09	5.0E-10	67.0
Pb-210 (suspended)	1.0E-09	3.0E-10	10.0	1.4E-09	3.0E-10	14.0
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	ND	N/A	N/A	1.6E-08	5.0E-09	N/A
Gross beta	ND	N/A	N/A	2.5E-08	6.4E-09	N/A
Sample Location	SW-1					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	4.8E-09	N/A	1.6	No Sample – Dry		
Uranium (suspended)	ND	N/A	N/A			
Ra-226 (dissolved)	6.0E-10	1.0E-10	1.0			
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)	2.4E-09	4.0E-10	24.0			
Po-210 (dissolved)	ND	N/A	N/A			
Po-210 (suspended)	ND	N/A	N/A			
Gross alpha	1.2E-08	3.3E-09	N/A			
Gross beta	2.2E-08	6.0E-09	N/A			

* Lower Limits of Detection and Effluent Concentration values from 10 CFR 20, Appendix B, Table 2 are listed in Table 6

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

Table 8 - Surface Water Monitoring Results, 1Q and 2Q 2018 (Continued)

Sample Location	SW-2					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	8.6E-09	N/A	2.9	No Sample – Dry		
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)	2.4E-09	4.0E-10	24.0			
Po-210 (dissolved)	ND	N/A	N/A			
Po-210 (suspended)	ND	N/A	N/A			
Gross alpha	1.4E-08	3.3E-09	N/A			
Gross beta	2.1E-08	5.8E-09	N/A			

Sample Location	SW-3					
Parameter	1st Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	% Eff. Conc.*
Uranium (dissolved)	1.4E-08	N/A	4.5	8.9E-09	N/A	3.0
Uranium (suspended)	ND	N/A	N/A	ND	N/A	N/A
Ra-226 (dissolved)	8.0E-10	1.0E-10	1.3	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	2.7E-10	2.0E-10	0.3
Th-230 (suspended)	ND	N/A	N/A	9.0E-10	3.0E-10	0.9
Pb-210 (dissolved)	ND	N/A	N/A	ND	N/A	N/A
Pb-210 (suspended)	ND	N/A	N/A	1.2E-09	3.0E-10	12.0
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	1.6E-08	3.7E-09	N/A	1.0E-08	4.3E-09	N/A
Gross beta	1.7E-08	5.9E-09	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 6

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

Table 9 - Processing Facility Air Particulate Effluent Results, 1Q and 2Q 2018

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**				
1st	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
2nd	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

Note: The LLD for uranium, Th-230, and Ra-226 was 1E-12 µCi/mL, and the LLD for Pb-210 was 2E-12 µCi/mL.
N/A = Not Applicable; ND = Non-Detect

Table 10 - Wellfield Air Particulate Effluent Results, 1Q and 2Q 2018

Location	Radionuclide	1st Quarter Concentration (µCi/mL)	Error ± (µCi/mL)	2nd Quarter Concentration (µCi/mL)	Error ± (µCi/mL)	Net Concentration (µCi/mL)	Effluent Released (Ci)
Header house 1	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 2	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 3	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 4	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 5	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A

Note: The LLD for uranium, Th-230, and Ra-226 was 1E-12 µCi/mL, and the LLD for Pb-210 was 2E-12 µCi/mL.

Table 10 - Wellfield Air Particulate Effluent Results, 1Q and 2Q 2018 (Continued)

Location	Radionuclide	1st Quarter Concentration (µCi/mL)	Error ± (µCi/mL)	2nd Quarter Concentration (µCi/mL)	Error ± (µCi/mL)	Net Concentration (µCi/mL)	Effluent Released (Ci)
Header house 6	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 7	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 8	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 9	U-Nat	ND	N/A	ND	N/A	N/A	N/A
	Th-230	ND	N/A	ND	N/A	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	N/A	N/A
Header house 10	U-Nat	NM	NM	ND	N/A	N/A	N/A
	Th-230	NM	NM	ND	N/A	N/A	N/A
	Ra-226	NM	NM	ND	N/A	N/A	N/A
	Pb-210	NM	NM	ND	N/A	N/A	N/A

Note: The LLD for uranium, Th-230, and Ra-226 was 1E-12 µCi/mL, and the LLD for Pb-210 was 2E-12 µCi/mL.
N/A = Not Applicable, ND = Non-Detect, NM = Not Measured
Background Th-230 = 1.3E-16 µCi/mL (Table 1)

Table 11 - Processing Facility Radon Effluent Results, 1Q and 2Q 2018

Sample Date	Concentration Recovery (µCi/mL)	Error ± (µCi/mL)	Average Recovery Flow Rate for the Quarter (mLPM)	Concentration Injection (µCi/mL)	Error ± (µCi/mL)	Average Injection Flow Rate for the Quarter (mLPM)	Loss Term (µCi/minute)	Effluent Released (Ci)
1Q18	5.35E-05	1.07E-06	1.27E+07	5.67E-05	1.13E-06	1.19E+07	8	1.0
2Q18	4.48E-05	8.91E-07	9.29E+06	4.51E-05	8.98E-07	9.33E+06	-5	NC*
							TOTAL	**1.0**

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

* NC – Not calculated for negative loss terms.

Table 12 - Header House and Wellhead Radon Effluent Results, 1Q and 2Q 2018

Location	1st Quarter (µCi/mL)	Error ± (µCi/mL)	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	Semi-Annual Average Concentration by Location (µCi/mL)
Header house 1	2.6E-09	3.3E-10	3.3E-09	4.1E-10	3.0E-09
OZ-005	2.6E-07	5.2E-08	1.3E-07	2.3E-08	1.9E-07
OZ-054	9.2E-09	1.2E-09	2.2E-09	3.0E-10	5.7E-09
OZ-057	1.2E-09	1.7E-10	4.1E-10	1.1E-10	8.1E-10
Header house 2	6.9E-09	8.4E-10	8.7E-09	1.1E-09	7.8E-09
OZ-018	N/A	N/A	4.2E-08	7.5E-09	4.2E-08
OZ-160	1.0E-07	1.8E-08	2.3E-07	4.7E-08	1.7E-07
OZ-170	4.6E-09	5.5E-10	2.2E-09	3.0E-10	3.4E-09
Header house 3	6.90E-09	8.40E-10	5.70E-09	6.80E-10	6.3E-09
OZ-215	2.50E-09	3.30E-10	1.60E-10	1.10E-10	1.3E-09
OZ-262	2.30E-09	3.00E-10	2.6E-09	3.3E-10	2.5E-09
OZ-199	5.90E-09	7.10E-10	1.80E-09	2.50E-10	3.9E-09
Header house 4	2.00E-09	2.80E-10	4.90E-10	1.40E-10	1.2E-09
OZ-291	3.60E-09	4.60E-10	6.80E-10	1.40E-10	2.1E-09
OZ-267	1.27E-08	1.6E-09	7E-10	1.4E-10	6.7E-09
OZ-305	1.35E-08	2.00E-09	3.50E-09	4.40E-10	8.5E-09
Header house 5	3.70E-09	4.60E-10	5.50E-09	6.80E-10	4.6E-09
OZ-061	1.92E-08	2.9E-09	2.31E-08	3.80E-09	2.1E-08
OZ-075	6.2E-10	1.1E-10	6.50E-10	1.40E-10	6.4E-10
OZ-097	2.3E-09	3E-10	3.20E-09	4.10E-10	2.8E-09
Header house 6	3.4E-09	4.4E-10	4.40E-09	5.50E-10	3.9E-09
OZ-125	1.4E-09	1.7E-10	3.50E-10	1.10E-10	8.8E-10
OZ-153	6.2E-10	1.1E-10	5.40E-10	1.40E-10	5.8E-10
OZ-210	9.7E-10	1.4E-10	5.40E-10	1.10E-10	7.6E-10
Header house 7	2.2E-09	2.8E-10	3.20E-09	3.80E-10	2.7E-09
OZ-026	1.66E-08	2.5E-09	9.50E-09	1.20E-09	1.3E-08
OZ-169	8.58E-08	1.55E-08	1.17E-08	1.50E-09	4.9E-08

Table 12 - Radon Concentration in the Wellfield Results, 1Q and 2Q 2018 (Continued)

Location	1st Quarter (µCi/mL)	Error ± (µCi/mL)	2nd Quarter (µCi/mL)	Error ± (µCi/mL)	Semi-Annual Average Concentration by Location (µCi/mL)
OZ-424	3.77E-08	6.8E-09	2.75E-08	5E-09	3.3E-08
Header house 8	3.4E-09	4.4E-10	4E-09	4.9E-10	3.7E-09
OZ-279	1.14E-07	2.06E-08	1.92E-08	2.9E-09	6.7E-08
OZ-309	9.74E-08	1.76E-08	1.6E-07	3.2E-08	1.3E-07
OZ-368	N/A	N/A	>3.1E-07*	Not reported	>3.1E-07*
Header house 9	3.5E-09	4.4E-10	3.9E-09	4.6E-10	3.7E-09
OZ-324	9.94E-08	1.79E-08	1.5E-07	3.01E-08	1.2E-07
OZ-333	1.74E-07	3.48E-08	9.77E-08	1.58E-08	1.4E-07
OZ-318	1.21E-07	2.18E-08	2.78E-07	5.57E-08	2.0E-07
DDW	7.80E-10	1.40E-10	4.10E-10	1.10E-10	6.0E-10

* Note: In the 1st quarter, the detector for OZ-018 had been exposed too much to give a reportable result and the detector for OZ-368 was damaged. The 2nd quarter radon results for OZ-368 were reported by the contract laboratory as greater than 314 pCi/L, since reportable results could not be provided due to the exposure to the detectors. The semi-annual average concentration was based on a concentration of greater than 314 pCi/L.

NA - Not available, radon cups were damaged or too exposed to give a reportable result.

Table 13 - Wellfield Radon Effluent Results, 1st Half 2018

Location	Annual Average Concentration (µCi/mL)	Net Annual Average Concentration (µCi/mL)	Effluent Released per Location (µCi)	Number of Recovery Wells	Semi-Annual Effluent Released (Ci)
Header house 1 Recovery Wells	6.6E-08	6.6E-08	3.4E+01	29	9.9E-04
Header house 2 Recovery Wells	7.1E-08	7.0E-08	3.6E+01	30	1.1E-03
Header house 3 Recovery Wells	2.5E-09	2.2E-09	1.1E+00	30	3.4E-05
Header house 4 Recovery Wells	5.8E-09	5.4E-09	2.8E+00	17	4.8E-05
Header house 5 Recovery Wells	8.2E-09	7.8E-09	4.0E+00	26	1.1E-04
Header house 6 Recovery Wells	7.4E-10	3.6E-10	1.8E-01	28	5.2E-06
Header house 7 Recovery Wells	3.1E-08	3.1E-08	1.6E+01	24	3.9E-04
Header house 8 Recovery Wells	1.7E-07	1.7E-07	8.8E+01	27	2.4E-03
Header house 9 Recovery Wells	1.5E-07	1.5E-07	7.9E+01	25	2.0E-03
Header house 1	3.0E-09	2.6E-09	6.3E+03	N/A	6.3E-03
Header house 2	7.8E-09	7.4E-09	1.8E+04	N/A	1.8E-02
Header house 3	6.3E-09	5.9E-09	1.5E+04	N/A	1.5E-02
Header house 4	1.2E-09	8.7E-10	2.1E+03	N/A	2.1E-03
Header house 5	4.6E-09	4.2E-09	1.0E+04	N/A	1.0E-02
Header house 6	3.9E-09	3.5E-09	8.7E+03	N/A	8.7E-03
Header house 7	2.7E-09	2.3E-09	5.7E+03	N/A	5.7E-03
Header house 8	3.7E-09	3.3E-09	8.2E+03	N/A	8.2E-03
Header house 9	3.7E-09	3.3E-09	8.2E+03	N/A	8.2E-03
				Total (Ci):	**8.9E-02**

N/A = Not Applicable

Background for the 1st Half 2018 is 3.8E-10 µCi/mL (Table 3).

Table 14 – Total Air Particulate Effluent, 1Q and 2Q 2018

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

N/A = Not Applicable

Appendix B

Annual Technical Inspection of Lined Retention Ponds Report

MEMORANDUM

WWC ENGINEERING

1849 Terra Avenue Sheridan, Wyoming 82801
PHONE: (307) 672-0761 FAX: (307) 674-4265 WEBSITE: www.wwcengineering.com

TO: **Mike Griffin, Strata**
Royal Pond, Strata

FROM: **Wade Filkins, P.E., WWC**

DATE: **August 23, 2018**

SUBJECT: **Ross CPP Area 2018 Annual Civil Inspections**

On June 27, 2018, WWC inspected the following Ross facilities: the Oshoto Reservoir embankment and emergency spillway, lined retention pond 1, the flood control diversion berm and channel, and the sediment pond. The individual inspection reports and inspection photos are attached to this memorandum. With the exception of the Oshoto reservoir embankment, the majority of the facilities were recently constructed, and as such, there were few notable items or recommended corrective actions. A summary of each facility inspection is discussed below.

Oshoto Reservoir Embankment and Spillway

Repairs and improvements made to the dam in 2012 that included placement of riprap on the upstream embankment face and repairs to the downstream embankment slope appeared to be intact and stable. Improvements to the embankment and emergency spillway for the purpose of accessing wellfields across the embankment appeared to be stable; however, the riprap on the emergency spillway road crossing is silted in. WWC recommends replacing riprap in this area. As noted on the inspection form, historic seepage on the downstream toe of the embankment should continue to be monitored. The headcuts on the downstream embankment face and in the emergency spillway should also continue to be monitored. As noted in previous inspections, these headcuts are well vegetated and stable. The only corrective action for the impoundment required at this time is to replace or add riprap on the emergency spillway road crossing.

Lined Retention Pond 1

During the time of the inspection, Cells 2 and 3 were being utilized to store wastewater from the plant and wellfields, and Cell 1 was storing approximately 2 feet of rain water. No seeps or leaks were identified during the inspection. WWC recommends monitoring the repaired gullies on the north side of Cell 3 and on the east side of the shared embankment. During the inspection the underdrain flow totalizer display for Cell 1 was not readable. WWC recommends repairing the display.

Flood Control Diversion Berm and Channel

The diversion berm and channel are stable and well vegetated. The area is generally free of gullies, rills, and minor surface erosion. The only corrective action recommended is to remove grass and sediment from the downstream culvert flared end sections and to remove the shrub growing on top of the west culvert on the downstream side. Strata should continue to monitor for erosion on the embankment and sideslopes.

Sediment Pond

The water level in the sediment pond during the inspection was 2/3 of the way up the northwest inlet culvert. The sediment pond should always be maintained at a level at or below the invert of the lowest inlet culvert (northwest inlet culvert). As noted during the inspection, recent precipitation had raised the level of the pond, and it was being dewatered with a portable pump. The water level in the pond was estimated at 2-3 feet and the sediment level was also estimated at 2-3 feet. Strata should consider cleaning the sediment from the pond and possibly excavating deeper to allow for more runoff capacity for precipitation events. Prior to cleaning the sediment pond and disposing of the sediment, WDEQ should be notified. Strata should continue to monitor the repaired gullies on the north side of the pond and reinstall an animal/trash rack on the sediment pond discharge pipe located in the diversion channel.

Annual Impoundment Inspection Report

INSPECTOR: Wade Filkins, P.E. TITLE: Project Engineer

INSPECTION DATE: 6/27/18 DATE LAST INSPECTION: 5/17/17

PROJECT: Ross ISR Project IMPOUNDMENT: Oshoto Reservoir

1. EMBANKMENT STABILITY		
a. Downstream Embankment Conditions:	Cracks on crest (downstream side)	No
	Cracks on the slope	None visible, Heavy vegetation on dam face.
	Bulging on slope	No
	Bulging at toe	No
	Shallow surface movement	No
b. Upstream Embankment Conditions:	Cracks on crest (upstream side)	No.
	Cracks on slope	None visible, Heavy vegetation on dam face.
	Bulging on slope above water level	No
	Bulging on slope at or beneath water level	Not visible
	Shallow surface movement	No
c. Slope Erosion:	Gullies on slope	Some small gullies and minor headcuts on downstream slope. Erosion is well vegetated and looks to be from years past. Advise to monitor.
	Gullies on toe	No
	Gullies at abutment	No
	Minor erosion	As noted above.

d. Seepage:	At isolated points.....	Yes, along toe in channel at several points. Seeps have been present for years.
	At abutment.....	As noted above.
	Over large areas	No
	Boils.....	No
e. Foundation Movement:	Horizontal movement away from slope	No
	Bulging of downstream foundation materials	No
f. Embankment Freeboard:	(Actual vs. Required).....	Approximately 6 feet below dam crest and 2-3 feet below spillway invert.
2. INLET & OUTLET SYSTEMS		
a. Spillway Channels and Pipes:	Obstruction by vegetation.....	No, well vegetated.
Note: No level outlet. Culvert spillway (north of reservoir under road flowing.	Obstruction by slough of slopes ...	No
	Erosion of channel or sideslopes..	No, well vegetated.
	Condition at discharge.....	Headcut in transport section has been remediated and looks stable.
	Deterioration of riprap	Riprap is silted in. Advise adding riprap at road crossing.
	Deterioration of concrete.....	N/A
	Crushing or cracking of pipes.....	N/A
	Corrosion of pipes.....	N/A
b. Decant System:	Obstruction at pipe inlet.....	N/A
	Obstruction at pipe outlet	Outlet pipe historically silted in/ broken.

	Corrosion or damage to trash rack.....	N/A
	Cracking, crushing, or corrosion of pipe.....	N/A
	Deterioration of riprap or concrete	N/A
c. Diversion Ditches:	Obstruction by vegetation.....	N/A
	Obstruction by sloughing of slopes	N/A
	Erosion of channel and slopes	N/A
	Deterioration of riprap or paving ...	N/A
	Condition at ditch discharge points	N/A
3. MONITORING		
a. Water Level:	Staff gage reading.....	Approximately 6 feet below dam crest and 2-3 feet below spillway invert.
	Abnormal increase in water level without heavy rainfall.....	No
	Abnormally long period of high water after storm	No
	Decrease in water level without corresponding change in operations	No
	Weir gage or discharge reading ...	N/A
b. Sediment Level:	Staff Gage Reading.....	Not visible

Recommended Corrective Actions: Continue to monitor seepage on downstream toe. Seepage has
occurred historically based on vegetation type present and previous inspections. Also continue to
monitor minor headcuts on downstream slope. Replace riprap at road crossing of emergency spillway
As in-place riprap is mostly silted in.

Lined Retention Pond
Annual Impoundment Inspection Report

INSPECTOR: Wade Filkins P.E. TITLE: Project Engineer

INSPECTION DATE: 6/27/18 DATE LAST INSPECTION: 5/17/17

PROJECT: Ross ISR Project IMPOUNDMENT: Lined Retention Pond 1

1. EMBANKMENT STABILITY		
a. Outslope Embankment Conditions:	Cracks on crest (downstream side)	No
	Cracks on the slope	No
	Bulging on slope	No
	Bulging at toe	No
	Shallow surface movement	No
b. Inslope Embankment Conditions:	Cracks on crest (upstream side)	No
	Liner condition	Liner and anchor trench in good condition.
	Bulging on slope above water level	No
	Bulging on slope at or beneath water level	Not visible.
	Shallow surface movement	No.
c. Slope Erosion:	Gullies on slope	Some small rills and gullies noted from last annual inspection areas have been filled with riprap and stabilized. Advise to monitor.
	Gullies on toe	No.
	Gullies at abutment	No
	Minor erosion	As noted above.

d. Seepage:	At isolated points.....	No
	At abutment.....	No
	Over large areas	No
	Boils.....	No
e. Foundation Movement:	Horizontal movement away from slope	No
	Bulging of downstream foundation materials	No
f. Embankment Freeboard:	(Actual vs. Required).....	Cell 1 has 13 feet, Cell 2 has 11 feet, Cell 3 has 9.5 feet
g. Visual survey of Embankment for settlement		No indications of settlement visible.
2. Piping System		
a. Underdrain Pipes	Obstruction by vegetation.....	No
	Obstruction by slough of slopes ...	No
	Erosion of channel or sideslopes..	No
	Condition at discharge.....	Well vegetated.
	Manhole conditions	No erosion around or silting in of manhole covers. Inside of manholes not inspected.
	Condition of pump.....	Not visible
	CAV condition	Not inspected
	Crushing or cracking of pipes.....	No
	Corrosion of pipes.....	No
b. Leak Detection System:	Pipe inlet.....	Not Visible

	Check for leak.....	No leaks during inspection.
	Cracking, crushing, or corrosion of pipe.....	No
	Deterioration of riprap or concrete	N/A
3. MONITORING		
a. Water Level:	Staff gage reading.....	Cell 1 depth: 2.0 feet Cell 2 depth: 4.0 feet Cell 3 depth: 5.5 feet
	Abnormal increase in water level without heavy rainfall.....	No
	Abnormally long period of high water after storm.....	No
	Decrease in water level without corresponding change in operations.....	No
	Discharge reading.....	Underdrain data reviewed at WWC office based on monthly reporting. At time of inspection, underdrain flow totalizer display for Cell 1 was not readable. Advise to repair.
b. Sediment Level:	Staff Gage Reading.....	N/A
c. Crest Survey:	Elevations of Benchmarks.....	Based on the visual inspection in Section 1, no survey is warranted at this time
d. Daily/Monthly/Quarterly Inspection/Review of Inspections:		Yes
Notes: Cells 2 and 3 are currently being used to store wastewater from the plant and wellfields. Cell 1 only contains rainwater.		
Recommended Corrective Actions: Monitor repaired gullies on north side of Cell 3 and on east side of shared embankment. Repair flow totalizer display for underdrain on Cell 1.		

Annual Diversion Inspection Report

INSPECTOR: Wade Filkins, P.E. TITLE: Project Engineer

INSPECTION DATE: 6/27/18 DATE LAST INSPECTION: 5/27/17

PROJECT: Ross ISR Project IMPOUNDMENT: Flood Control Diversion

1. EMBANKMENT STABILITY		
a. Downstream Embankment Conditions:	Cracks on crest (downstream side)	No
	Cracks on the slope	No
	Bulging on slope	No
	Bulging at toe	No
	Shallow surface movement	No
b. Upstream Embankment Conditions:	Cracks on crest (upstream side)	No
Note: Heavily Vegetated	Cracks on slope	No
	Bulging on slope above water level	No
	Bulging on slope at or beneath water level	No
	Shallow surface movement	No
c. Slope Erosion:	Gullies on slope	Minor gullies
	Gullies on toe	No
	Gullies at abutment	No
	Minor erosion	Minor in channel bottom upstream and downstream of the culverts.

d. Channel:	Vegetation.....	Stable vegetation, no action needed.
	At abutment..... Erosion	No
	Condition at discharge point.....	Stable, riprap in good shape.
e. Culvert:	Inlet riprap condition	Good. Remove obstructions (shrubs and grass) periodically.
	Outlet riprap condition	Good. Remove obstructions (shrubs and grass) periodically from flared end section bottom. Also remove shrub from top of top of downstream end of culvert.
2. INLET & OUTLET SYSTEMS		
a. French Drain:	Outlet pipe obstruction by vegetation	No
	Erosion of channel or sideslopes at discharge	No
	Condition at discharge.....	Good
	Deterioration of riprap	No
	Crushing or cracking of pipes.....	No
	Corrosion of pipes.....	No
	Pump vault.....	In working condition. Water running into vault at time of inspection.
	Pump	Pump not operating during time of inspection.
	Cracking, crushing, or corrosion of pipe.....	No
	Deterioration of riprap or concrete	No
b. Record:	Review of discharge records.....	French drain flowmeter reading at time of inspection: 931,440 gal. Total discharge July 2017 to inspection date is 452,320 gal (0.9 gpm).

Recommended Corrective Actions: Remove grass and sediment from downstream culvert flared end section. Also remove shrub growing on top of west culvert on downstream side. Continue to monitor for erosion on embankment and sideslopes.

Annual Impoundment Inspection Report

INSPECTOR: Wade Filkins, P.E. TITLE: Project Engineer

INSPECTION DATE: 6/27/17 DATE LAST INSPECTION: 5/17/17

PROJECT: Ross ISR Project IMPOUNDMENT: Sediment Pond

1. EMBANKMENT STABILITY		
a. Upstream Embankment Conditions:	Cracks on crest (upstream side)...	No
	Cracks on the slope	No
	Bulging on slope above water level	No
	Bulging on slope at or beneath water level.....	None visible
	Shallow surface movement	No
b. Slope Eroision:	Gullies on slope.....	Yes, several gullies same as noted during last annual inspection. Gullies have been filled with riprap and appear to be stable.
	Minor erosion	As noted above.
c. Seepage:	At isolated points.....	No
	Over large areas	No
	Boils	No
d. Embankment Freeboard:	(Actual vs. Required).....	Water level 2/3 up northwest pipe invert. Water level approximately 18 in above NWL.
2. INLET & OUTLET SYSTEMS		
a. Inlet Culverts:	Obstruction by vegetation.....	No pipe obstructions noted although heavy vegetation in ditches.
	Obstruction by slough of slopes ...	No

	Erosion of channel or sideslopes..	No
	Condition at discharge.....	Stable
	Deterioration of riprap	No
	Crushing or cracking of pipes.....	No
	Corrosion of pipes.....	No
b. Decant System:	Obstruction at pipe inlet.....	No, portable pump being used. Estimated discharge 50 gpm.
	Obstruction at pipe outlet	No
	Corrosion or damage to trash rack.....	Trash/animal screen on discharge end of pipe not present.
	Cracking, crushing, or corrosion of pipe.....	No
	Deterioration of riprap or concrete	No.
3. MONITORING		
a. Water Level:	Staff gage reading.....	Water level 2/3 up northwest inlet culvert.
	Abnormal increase in water level without heavy rainfall.....	No
	Abnormally long period of high water after storm.....	No
	Decrease in water level without corresponding change in operations.....	No
	Weir gage or discharge reading ...	Portable pump operating during inspection. Estimated discharge 50 gpm.
b. Sediment Level:	Staff Gage Reading or visual observation	Estimated at 2-3 feet of sediment. Consider cleaning out sediment.

Recommended Corrective Actions: Continue to monitor repaired gullies on north side of pond.
Reinstall an animal/trash rack on the pond discharge pipe located in the diversion channel. Maintain
water level below invert of northwest inlet culvert. Consider cleaning sediment as pond only has
several feet of capacity below the lowest inlet culvert invert (northwest).

2018 Annual Civil Inspection Photos

Silted Riprap at the Road Crossing of the Emergency Spillway

Repaired Gullies on North Side of Cell 3

Grass and Sediment in the Outlet of the Diversion Culvert

Shrub on Top of the Outlet of the Diversion Culvert

Sediment Pond Water and Sediment Level