HOMESTAKE
Grants Project

Homestake Mining Company of California

Jesse R. Toepfer
Closure Manager

20 August 2014

ATTN: Document Control Desk
Director, Office of Federal and State Materials and Environmental Management Programs
U.S. Nuclear Regulatory Commission,
Washington, DC 20555–0001

ATTN: Mr. Jack Parrott, Sr. Project Manager
Reactor Decommissioning Branch (Mailstop T-8F5)
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Program
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001

ATTN: Mr. David Mayerson
Ground Water Quality Bureau
New Mexico Environment Department
PO Box 5469
Santa Fe, NM 87502-5469

RE: Semi-Annual Environmental Monitoring Report for Period January – June 2014, In Accordance With Nuclear Regulatory Commission Docket No. 40-8903, License No. SUA 1471, and New Mexico Environment Department DP-200 Ground Water Discharge Plan

Mr. Parrott and Mr. Mayerson:

Pursuant to US Nuclear Regulatory Commission Regulation 10 CFR 40.65, Part 20, and in accordance with the applicable provisions stipulated in ground water discharge permit DP-200 issued by the New Mexico Environment Department, please find enclosed two (2) copies of the subject Semi-Annual Environmental Monitoring Report for the first half of 2014 (January – June) for Homestake's Grants Reclamation Project.

The 600-gpm reverse osmosis (RO) plant operated at an average rate of 216 gpm during the January to June 2014 reporting period.

Thank you for your time and attention on this matter. If you or anyone on your staff has any questions, please contact me at the Grants office at 505.287.4456, extension 34, or call me directly on my cell phone at 505.290.3067.

Respectfully,

Jesse R. Toepfer
Closure Manager
Homestake Mining Company of California
Office: 505.287.4456 x34 | Cell: 505.290.3067

FSME20

Copy To:

Mr. B. Spitzberg, US Nuclear Regulatory Commission, Decommissioning Branch
Mr. Sai Appaji, US Environmental Protection Agency, Region 6 – Dallas, Texas
Mr. Wayne Canon, New Mexico Office of the State Engineer – Albuquerque, New Mexico
Mr. Bill Ferdinand, Barrick Gold – Salt Lake City, Utah
Mr. Patrick Malone, Barrick Gold – Salt Lake City, Utah
Ms. C. Stafford, New Mexico State University Library Services – Grants, New Mexico
Ms. Deborah Barr, US Department of Energy, Office of Legacy Management – Grand Junction, Colorado

Homestake Mining Company P.O. Box 98, Grants, NM 87020 Tele: (505) 287-4456 Fax: (505) 287-9289

HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

SEMI-ANNUAL
ENVIRONMENTAL MONITORING REPORT

Reporting Period
January – June 2014

U.S. Nuclear Regulatory Commission License SUA-1471
State of New Mexico DP-200

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1.0 INTRODUCTION

This Semi-Annual Environmental Monitoring Report summarizes effluent monitoring data recorded for Homestake Mining Company of California - Grants Project (Homestake) from January through June 2014. The submittal of this report to the appropriate Nuclear Regulatory Commission (NRC) Regional Office and State of New Mexico within 60 days after January 1, and July 1 for each year of operation is required for all uranium mill facilities pursuant to 10 CFR Part 40.65. The monitoring data and the report format have been selected by Homestake representatives to satisfy the requirements of 10 CFR Part 40.65.

Homestake's monitoring and surveillance program for radioactive effluent releases have been designed to ensure the project compliance with 10 CFR Part 40, and Part 20 U.S. NRC Standards for Protection Against Radiation and closely approximates programs as described in NRC's Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills. Some effluent monitoring activities differ from those presented in the Regulatory Guide 4.14 as required by Homestake's Radioactive Materials License (SUA-1471).

Recontouring reclamation activities began in September 1993 and mill demolition commenced in late October 1993 and was completed December 10, 1995. A mill decommissioning completion report was submitted in February 1996 and approved by the NRC on January 28, 1999. The large tailings pile has been re-contoured and covered with interim cover on the top and radon barrier on the outslopes. Bedding and erosion protection was placed on the outslopes after placement of the radon barrier. Soil cleanup verification of the off-pile contaminated soil (windblown tailings) is complete; the completion report was submitted December 18, 1995 and approved by the NRC on January 29, 1999. In addition, a decommissioning report for the mine ion-exchange (IX) plant was completed and approved on December 22, 1997.

During this reporting period Homestake operated a reverse osmosis water treatment plant as part of the ongoing ground water restoration program at the site. For the operating period from January through June, the RO plant processed an average of 216-gpm while producing an average of 138-gpm of product water that was used for re-injection.

Homestake's groundwater monitoring program, as outlined in license Condition No. 35, continued throughout the report period. The requirements set forth in Condition No. 35 include the reporting of both radiological and non-radiological water quality parameters for specified wells, as well as the documentation of water injection and collection volumes of the groundwater cleanup system. The performance review of the corrective action program is submitted annually as a separate document and contains the groundwater monitoring information for January 1 through December 31 of each year. In order to meet NRC's requirement for semi-annual reporting, groundwater-monitoring data for the point-of-compliance (POC) wells and background well P is included in this report. It should be noted that while the POC wells will eventually be used to demonstrate groundwater restoration, they are not currently representative of off-site groundwater quality conditions.

2.0 ENVIRONMENTAL MONITORING PROGRAMS

The monitoring requirements for the site are summarized in Table 1, Table 2, and Table 3 attached. Details of the monitoring program are discussed in the following sections:

2.1 Air Particulate Monitoring

Homestake continuously samples total suspended particulate at seven locations around the site (see Figure 1). The locations identified as HMC-1, HMC-1A, HMC-2 and HMC-3 are areas at the property boundary expected to have the highest predictable concentrations of airborne radioactive particulate. The predominant wind direction is from the Southwest; accordingly, HMC-1, HMC-2 and HMC-3 are generally located down wind from Homestake's reclamation activities. HMC-1A is northeast pf EP-3 located north of the mill site. The location identified as HMC-6 represents background conditions, and is located west of the large tailings pile at the western most side of the property boundary. Locations HMC-4 and HMC-5 are site proximal to the nearest residences. HMC-7 is a blank Whatman filter that is analyzed as a lab and filter manufacturer quality check sample. The results are presented in Attachment 1.

Homestake uses Sierra Instruments Model #305-200 High Volume Air Samplers (or equivalent) to continuously sample the ambient air at the locations shown in Figure 1. The samples are collected on 8-inch by 10-inch Whatman glass fiber filters (or equivalent), which are changed weekly or more frequently as required by dust loading. Energy Laboratories, Inc analyzes the collected samples quarterly for Natural Uranium, Radium-226, Thorium-230 and Vanadium.

2.2 Radon Gas Monitoring

Radon gas concentrations are monitored on a continuous basis at the nine locations identified in Figure 1. The background station for radon gas is HMC #16, located northwest of the site. Landauer Corporation track-etch passive radon monitors (PRM), or the equivalent, are used to continuously monitor radon gas at each sampling location. Quarterly Homestake personnel place new alpha particle sensitive detectors at the monitoring locations and the exposed detectors are retrieved and returned to Landauer Corporation for analysis. The technique by which the PRM detectors measure radon gas concentrations consists of exposing an alpha-particle sensitive plastic detector, which is mounted in a plastic container, to ambient air. The decay of radon gas contained in the ambient air causes imprint tracks on the alpha-sensitive detector that can then be counted at a later time. The radon gas concentration can subsequently be calculated by determining the number of tracks per unit area of the detector. A filter is placed over the container opening to inhibit the entrance of any alpha-emitting dust particles. The semi-annual average results are presented in Attachment 2.

3.0 WATER QUALITY MONITORING

Table 2 (8-99, as modified by Amendment 34), as attached, outlines the water quality sampling frequency and parameters monitored. In addition, the volumes of water injected and recovered

as part of the ground-water cleanup program are monitored on a weekly basis and the rates documented. A performance review report is submitted by March 31 of each year according to License Condition 35E. The groundwater monitoring data for the POC wells and background well P, as required to comply with 10 CFR 40.65, are reported in Tables 2.1.1 through 2.1.4. The water quality of the POC wells is currently being restored and therefore the reported levels are not representative of steady state aquifer conditions at the present time. The concentration levels are therefore not compared to 10 CFR 20 effluent limits. A hydraulic barrier forces the water in the aquifer near these POC wells to move in the direction of the collection wells where the water is withdrawn and treated. Due to these conditions, water level data on these wells are also not reflective of steady state conditions and therefore are not reported herein.

4.0 DIRECT RADIATION

Gamma exposure rates are continuously monitored through the use of optically stimulated luminescence (OSL) dosimeter badges placed at each of the eight locations identified in Figure 1. HMC #16 is considered the background location for direct radiation. Each OSL badge consists of an aluminum oxide detector within a plastic holder. The plastic provides adequate protection from weather for these badges to be used out-of-doors. The OSL's are exchanged semi-annually and analyzed by an approved independent laboratory (currently Landauer Inc.). The levels of direct environmental radiation are recorded for each of the eight locations. Pertinent sample data are reported in Attachment 3.

5.0 SURFACE CONTAMINATION

The Occupational Monitoring Program requirements are summarized in Table 3. The aspects related to contamination control are discussed briefly below.

5.1 Personnel Skin and Clothing

The monitoring of personnel for alpha contamination is required as part of all radiation work permits using standard operating procedures. No releases of personnel or clothing above administrative limits were reported during this reporting period.

5.2 Survey of Equipment Prior to Release for Unrestricted Use

Equipment surveys are required for all equipment that is to be removed from contaminated areas as specified in radiation work permits. Standard Operating Procedures are used for these surveys. No releases of contaminated material above NRC release criteria were reported.

6.0 LOWER LIMIT OF DETECTION

Homestake representatives have calculated the Lower Limit of Detection (LLD) for each measurement system, where applicable; to more accurately evaluate concentrations of radioactive material measured in the environment surrounding the mill site. The lower limit of detection is defined in U.S. Nuclear Regulatory Guide 8.30 – Appendix B as the smallest concentration of radioactive material that has a 95% probability of being detected. Radioactive material is "detected" if the value measured on an instrument is high enough to conclude that

activity above the system background is probably present. Since the LLD is a function of sample volume, counting efficiency, radiochemical yield, etc., it varies for different sampling and analysis procedures.

For the individual measurement systems for which Homestake calculates LLDs, the following formula is utilized:

$$LLD = \frac{3+4.66\ S_b}{3.7\ E\ 4\ EvY \exp(-\lambda t)}$$

Where:

LLD	is the lower limit of detection (microcuries per milliliter);
S_b	is the standard deviation of the instrument background counting rate (counts per second);
3.7 E 4	is the number of disintegrations per second per microcurie;
E	is the counting efficiency (counts per disintegration);
v	is the sample volume (milliliters);
Y	is the fractional radiochemical yield (when applicable);
λ	is the radioactive decay constant for the particular radionuclide; and;
t	is the elapsed time between sample collection and counting

The value of S_b used in the calculation of the LLD for a particular measurement system will be based on the actual observed variance of the instrument background counting rate. The laboratory has been instructed to report the LLD for each measurement considering all of the parameters associated with the measurement system and the sample size.

The vendor laboratory that performed the analyses reported herein has documented that the LLD for air and water samples will meet or exceed the requirements in Regulatory Guide 4.14. This assumes a minimum water sample size of 1 liter and an air sample volume of 2 E09 ml. Landauer, Inc (vendor lab) reports the LLD for radon-222. The Regulatory Guide 4.14 LLDs for the constituents are:

Ra-226, Th-230 in air	1 E-16 µCi/ml
Rn-222 in air	30 pCi(d/l)
U-nat in air	1 E-16 µCi/ml
U-rad in water	2 E-10 µCi/ml
Ra-226, Th-230 in water	2 E-10 µCi/ml

Uranium is analyzed by ICP-MS methods by the current vendor laboratory. In order to determine the LLD, the laboratory has performed the analysis on a blank sample many times and uses the standard deviation of these background measurements to calculate the LLD. This LLD is specified for all analyses as long as the sample size or volume meets the minimum value.

7.0 DATA SUMMARY AND CONCLUSIONS

The summaries of Homestake's effluent monitoring program included in this submittal contain data for each of the regulated parameters released to unrestricted areas. DP-200, dated November 15, 1995, and 10 CFR Part 40.65 requires that Homestake submit effluent release monitoring data to the State of New Mexico and the NRC within 60 days of the end of the six-month period ending January 1 and July 1 of each year. Homestake is submitting this report to satisfy the regulatory requirements cited above. The attachments included in this report summarize the results of the effluent monitoring activities conducted by Homestake and pertinent to the required monitoring time period.

The data collected in many of Homestake's effluent monitoring programs can be readily compared to 10 CFR Part 20 values. During the report period, Homestake has not exceeded 10 CFR Part 20 values in any of their effluents covered by this report. This, of course, does not include the ground water values at the POC wells as discussed earlier.

Table 1 - Environmental Monitoring Program Excluding Groundwater Monitoring

Table 1 - Environmental Monitoring Program Excluding Groundwater Monitoring

Type of Sample	Number	Locations	Method	Frequency	Analytical Parameters
AIR Particulates	4	HMC-1, HMC-1A, HMC-2, HMC-3 at or near the site boundary in sectors that have the highest predicted concentrations of radioactive airborne particulates.	Continuous (High Vol.)	Weekly filter change or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230 Vanadium
	2	HMC-4, HMC-5 at site boundary nearest occupied residences	Continuous (High Vol.)	Weekly filter change, or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230 Vanadium
	1	HMC-6 background location	Continuous (High Vol.)	Weekly filter change, or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230 Vanadium
Radon Gas	9	Locations described in Air - Particulates & HMC-7 on S boundary, HMC-1A near Evaporation Pond (EP-3), & HMC-16 as a background	Continuous Track-etch	Quarterly	Rn-222
DIRECT RADIATION	8	Locations described in Air - Particulates & HMC-16 as a background	OSL	Semi-Annual	Gamma Exposure Rate

Table 2 – Groundwater Monitoring Program (8-99, as modified by Amendment 34)

Table 2 – Groundwater Monitoring Program (8-99 as modified by Amendment 34)

Well Number	Parameters to be Monitored	Frequency of Monitoring
#1 & #2 Deepwells	D	Annually
Broadview Acres Wells 446, SUB1, SUB2, SUB3	G	Annually
Felice Acres Wells 490, 492, 493, 494	G	Annually
Murray Acres Wells 802, 844	G	Annually
Pleasant Valley Wells 688, 846	G	Annually
Regional Wells 920, 942	G	Annually
Site Monitoring Wells F, FB, GH, MO, CW2	G	Annually
Collection System Wells	Total Volume	Monthly
Injection System Wells	Total Volume	Monthly
Reversal Wells B, BA, KZ, KF, SO, SP, S1, S2	Water Level	Weekly
Point of Compliance Wells D1, X, S4	B, F	Annually
Background Well P	B	Annually

B = Water Level, pH, TDS, SO_4, Cl, HCO_3, CO_3, Na, Ca, Mg, K, NO_3, U, Se, Mo, Ra-226
D = Ca, Mg, K, Na, HCO_3, CO_3, Cl, SO_4, pH, TDS, Al, As, Ba, Cd, Co, Cu, CN, F, Fe, Pb, Mn, Hg, Mo, Ni, NO_3 as N, Se, Ag, Zn, U, Filtered Ra-226
F = V, Ra-228, Th-230
G = Water Level, SO_4, U, Se, TDS, Mo

Table 3 - Occupational Monitoring Program (6-00)

Table 3 – Occupational Monitoring Program (6-00)

Type of Sample	Number	Locations	Method	Frequency	Analytical Parameters
Lapel Personal Air Sample	As required by RWP	As required by RWP (2 L/min or equivalent)	HP-1	As required by RWP	Alpha, U-Nat
Lapel Personal Air Sampler Calibration	As required by RWP	N/A	HP-1	As required by RWP	Flow rate
Release of Equipment	As required by RWP	Potentially Contaminated Equipment and Materials	HP-4	As required by RWP	Alpha, beta gamma
ALARA	N/A	As required by RPA	HP-6	N/A	As required by RPA
Respiratory Protection	As required by RWP	As required by RWP	HP-7	N/A	N/A
Bioassay	As required by RWP	As required by RWP	HP-8 after mill decommissioning; termination	Baseline, Semi-annual	U-Nat in urine
Instrument Calibration	Variable	Radiation Detection Instruments in use	HP-10	Annually	N/A
Personnel Gamma (OSL)	Variable	Personnel	HP-11	Quarterly	Gamma
Personnel Contamination	As required by RWP	As required by RWP	HP-12	As required by RWP	Alpha
Radiation Protection Training	As required	Mill Site taught by RPA (certified individual) subjects as per Reg Guide 8.31	HP-14 for people working with groundwater or physical work with tailings sand/ slimes	Initial & annual refresher	Training Class & Written Test

HP-# = Homestake procedure number; RPA = Radiation Protection Administrator;
RWP = Radiation Work Permit; OSL = Optically Stimulated Luminescence dosimeter

Figure 1 – Monitoring & Sampling Locations

Attachment 1 – High Volume Air Sampling Results

ENERGY LABORATORIES
www.energylab.com
Analytical Excellence Since 1952
Helena, MT 877-472-0711 • Billings, MT 800-735-4489 • Casper, WY 888-235-0515
Gillette, WY 866-686-7175 • Rapid City, SD 888-672-1225 • College Station, TX 888-690-2218

ANALYTICAL SUMMARY REPORT

April 20, 2014

Homestake Mining Co
Hwy 605
Grants, NM 87020

Work Order: C14030856 Quote ID: C775 - Hi-Vol Filters

Project Name: 1st Quarter 2014 Comp

Energy Laboratories, Inc. Casper WY received the following 8 samples for Homestake Mining Co on 3/31/2014 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C14030856-001	HMC-1	03/28/14 00:00	03/31/14	Filter	Metals by ICP/ICPMS, Total Field Parameters Digestion, Total Metals RAD Alternate Unit Reporting Air Filters Radium 226 Thorium, Isotopic
C14030856-002	HMC-1-A	03/28/14 00:00	03/31/14	Filter	Same As Above
C14030856-003	HMC-2	03/28/14 00:00	03/31/14	Filter	Same As Above
C14030856-004	HMC-3	03/28/14 00:00	03/31/14	Filter	Same As Above
C14030856-005	HMC-4	03/28/14 00:00	03/31/14	Filter	Same As Above
C14030856-006	HMC-5	03/28/14 00:00	03/31/14	Filter	Same As Above
C14030856-007	HMC-6	03/28/14 00:00	03/31/14	Filter	Same As Above
C14030856-008	HMC-7 Filter Comp	03/28/14 00:00	03/31/14	Filter	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-1

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-001	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2014	^{230}Th	3E-17	8E-18	5E-18	1E-16	3E-14	9E-02
Air Volume in mLs	^{226}Ra	3E-17	5E-18	4E-18	1E-16	9E-13	3E-03
1.34E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-001
Client Sample ID: HMC-1

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/15/14 00:15 / clm
RADIONUCLIDES - IN AIR							
Radium 226	2.9E-17	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	4.7E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.8E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	2.6E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	8.4E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	5.4E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	1.1E-16	uCi/mL		1.0E-16		SW6020	04/11/14 01:34 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.9	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.64	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.51	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	3.5	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	1.1	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.72	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	14.5	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	134000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-1-A

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-002	^{nat}U	8E-17	N/A	N/A	1E-16	9E-14	9E-02
First Quarter 2014	^{230}Th	2E-17	6E-18	4E-18	1E-16	3E-14	7E-02
Air Volume in mLs	^{226}Ra	2E-17	4E-18	4E-18	1E-16	9E-13	3E-03
1.61E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-002
Client Sample ID: HMC-1-A

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/15/14 00:18 / clm
RADIONUCLIDES - IN AIR							
Radium 226	2.3E-17	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	4.3E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.7E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	2.0E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	5.6E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	4.0E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	<1.0E-16	uCi/mL		1.0E-16		SW6020	04/11/14 01:37 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.7	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.69	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.60	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	3.2	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	0.90	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.64	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	12.9	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	161000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-2

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-003	^{nat}U	9E-17	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2014	^{230}Th	2E-17	7E-18	5E-18	1E-16	3E-14	8E-02
Air Volume in mLs	^{226}Ra	4E-17	5E-18	4E-18	1E-16	9E-13	4E-03
1.29E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-003
Client Sample ID: HMC-2

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/15/14 00:21 / clm
RADIONUCLIDES - IN AIR							
Radium 226	3.8E-17	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	5.3E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.7E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	2.4E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	6.9E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	5.3E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	<1.0E-16	uCi/mL		1.0E-16		SW6020	04/11/14 01:40 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	4.9	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.68	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.48	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	3.1	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	0.89	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.69	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	11.7	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	129000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-3

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-004	^{nat}U	5E-16	N/A	N/A	1E-16	9E-14	5E-01
First Quarter 2014	^{230}Th	3E-17	8E-18	4E-18	1E-16	3E-14	1E-01
Air Volume in mLs	^{226}Ra	8E-17	7E-18	4E-18	1E-16	9E-13	9E-03
1.22E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-004
Client Sample ID: HMC-3

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/15/14 00:24 / clm
RADIONUCLIDES - IN AIR							
Radium 226	7.9E-17	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	7.3E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.7E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	3.4E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	8.1E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	3.8E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	4.9E-16	uCi/mL		1.0E-16		SW6020	04/11/14 01:47 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	9.6	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.89	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.46	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	4.2	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	0.98	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.46	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	59.8	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	122000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-4

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-005	^{nat}U	2E-16	N/A	N/A	1E-16	9E-14	2E-01
First Quarter 2014	^{230}Th	5E-17	9E-18	3E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	1E-16	8E-18	4E-18	1E-16	9E-13	1E-02
1.13E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-005
Client Sample ID: HMC-4

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.23	mg/filter		0.10		SW6020	04/15/14 00:31 / clm
RADIONUCLIDES - IN AIR							
Radium 226	1.1E-16	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	8.4E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.7E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	5.3E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	9.4E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	3.4E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	2.2E-16	uCi/mL		1.0E-16		SW6020	04/11/14 01:50 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	12.3	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.95	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.42	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	6.0	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	1.1	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.39	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	24.7	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	112000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-5

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-006	^{nat}U	2E-16	N/A	N/A	1E-16	9E-14	2E-01
First Quarter 2014	^{230}Th	3E-17	8E-18	4E-18	1E-16	3E-14	1E-01
Air Volume in mLs	^{226}Ra	7E-17	7E-18	4E-18	1E-16	9E-13	8E-03
1.24E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-006
Client Sample ID: HMC-5

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.12	mg/filter		0.10		SW6020	04/15/14 00:50 / clm
RADIONUCLIDES - IN AIR							
Radium 226	6.8E-17	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	6.8E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.7E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	3.1E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	7.7E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	4.3E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	1.8E-16	uCi/mL		1.0E-16		SW6020	04/11/14 01:53 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	8.4	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.84	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.46	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	3.8	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	0.95	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.53	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	22.0	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	124000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-6

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-007	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2014	^{230}Th	4E-17	1E-17	5E-18	1E-16	3E-14	1E-01
Air Volume in mLs	^{226}Ra	3E-18	3E-18	4E-18	1E-16	9E-13	3E-04
1.21E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-007
Client Sample ID: HMC-6

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.11	mg/filter		0.10		SW6020	04/15/14 00:44 / clm
RADIONUCLIDES - IN AIR							
Radium 226	2.7E-18	uCi/mL	U			E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	2.6E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.9E-18	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	4.3E-17	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	9.5E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	5.1E-18	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	1.0E-16	uCi/mL		1.0E-16		SW6020	04/11/14 02:06 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	0.33	pCi/Filter	U			RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.31	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.47	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	5.2	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	1.2	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.62	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	12.3	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	121000000	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 1st Quarter 2014 Comp
REPORT DATE: April 20, 2014

SAMPLE ID: HMC-7 Filter Comp

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-008	^{nat}U	9E-18	N/A	N/A	1E-16	9E-14	1E-02
First Quarter 2014	^{230}Th	3E-18	2E-18	3E-18	1E-16	3E-14	1E-02
Air Volume in mLs	^{226}Ra	4E-17	5E-18	3E-18	1E-16	9E-13	5E-03
1.29E+11							

Air Volumes on this page based on average of quarterly set; accompanying standard report uses a 1 L default volume.

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp
Lab ID: C14030856-008
Client Sample ID: HMC-7 Filter Comp

Report Date: 04/20/14
Collection Date: 03/28/14
Date Received: 03/31/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/15/14 00:47 / clm
RADIONUCLIDES - IN AIR							
Radium 226	5.8E-09	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 precision (±)	6.2E-10	uCi/mL				E903.0	04/09/14 08:17 / trs
Radium 226 MDC	3.6E-10	uCi/mL				E903.0	04/09/14 08:17 / trs
Thorium 230	3.8E-10	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 precision (±)	2.5E-10	uCi/mL				E908.0	04/15/14 17:13 / dmf
Thorium 230 MDC	3.5E-10	uCi/mL				E908.0	04/15/14 17:13 / dmf
Uranium, Activity	1.1E-09	uCi/mL		1.0E-16		SW6020	04/11/14 02:09 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	5.8	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 precision (±)	0.62	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Radium 226 MDC	0.36	pCi/Filter				RADCALC	04/16/14 18:48 / sec
Thorium 230	0.38	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 precision (±)	0.25	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Thorium 230 MDC	0.35	pCi/Filter				RADCALC	04/17/14 17:34 / sec
Uranium, Activity	1.1	pCi/Filter		0.20		RADCALC	04/16/14 18:48 / sec
FIELD PARAMETERS							
Air Filtering Volume	1	L				FIELD	03/28/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Report Date: 04/20/14
Project: 1st Quarter 2014 Comp
Work Order: C14030856

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: R185276
Lab ID: C14030856-001ADUP	3	Sample Duplicate				Run: BERTHOLD 770-1_140403A				04/09/14 08:17
Radium 226		3.90E-08	pCi/L					30	39.7	
Radium 226 precision (±)		5.42E-09	pCi/L							
Radium 226 MDC		3.85E-09	pCi/L							
Lab ID: C14030856-008AMS		Sample Matrix Spike				Run: BERTHOLD 770-1_140403A				04/09/14 11:22
Radium 226		70.2	pCi/L		90	70	130			
Lab ID: LCS-40981		Laboratory Control Sample				Run: BERTHOLD 770-1_140403A				04/09/14 11:22
Radium 226		25.3	pCi/L		120	80	120			
Lab ID: MB-40981	3	Method Blank				Run: BERTHOLD 770-1_140403A				04/09/14 11:22
Radium 226		-0.01	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: LCS-41000		Laboratory Control Sample				Run: BERTHOLD 770-1_140403A				04/09/14 11:22
Radium 226		19.5	pCi/L		90	80	120			
Lab ID: MB-41000	3	Method Blank				Run: BERTHOLD 770-1_140403A				04/09/14 11:22
Radium 226		0.2	pCi/L							U
Radium 226 precision (±)		0.2	pCi/L							
Radium 226 MDC		0.2	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 1st Quarter 2014 Comp

Report Date: 04/20/14
Work Order: C14030856

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0										Batch: R185567
Lab ID: C14040038-001AMS		Sample Matrix Spike				Run: ALPHANALYST_140404A				04/15/14 17:14
Thorium 230		0.0223	pCi/L		102	70	130			
Lab ID: C14040038-001AMSD		Sample Matrix Spike Duplicate				Run: ALPHANALYST_140404A				04/15/14 17:14
Thorium 230		0.0217	pCi/L		98	70	130	2.9	29.9	
Lab ID: LCS-41000		Laboratory Control Sample				Run: ALPHANALYST_140404A				04/15/14 17:14
Thorium 230		18.0	pCi/L		108	80	120			
Lab ID: MB-40967	3	Method Blank				Run: ALPHANALYST_140404A				04/15/14 17:14
Thorium 230		0.3	pCi/L							
Thorium 230 precision (±)		0.1	pCi/L							
Thorium 230 MDC		0.2	pCi/L							
Lab ID: MB-40981	3	Method Blank				Run: ALPHANALYST_140404A				04/15/14 17:14
Thorium 230		0.2	pCi/L							
Thorium 230 precision (±)		0.1	pCi/L							
Thorium 230 MDC		0.1	pCi/L							
Lab ID: MB-41000	3	Method Blank				Run: ALPHANALYST_140404A				04/16/14 13:13
Thorium 230		0.08	pCi/L							U
Thorium 230 precision (±)		0.08	pCi/L							
Thorium 230 MDC		0.1	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Report Date: 04/20/14
Project: 1st Quarter 2014 Comp
Work Order: C14030856

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Analytical Run: ICPMS2-C_140410B	
Lab ID: **ICV**		Initial Calibration Verification Standard							04/10/14 13:37	
Uranium		0.0501	mg/L	0.00030	100	90	110			
Lab ID: **ICSA**		Interference Check Sample A							04/10/14 13:40	
Uranium		1.69E-05	mg/L	0.00030						
Lab ID: **ICSAB**		Interference Check Sample AB							04/10/14 13:44	
Uranium		4.00E-06	mg/L	0.00030						
Method: **SW6020**									Batch: 40981	
Lab ID: **MB-40981**		Method Blank				Run: ICPMS2-C_140410B			04/11/14 01:14	
Uranium		ND	mg/filter	2E-05						
Lab ID: **LCS2-40981**		Laboratory Control Sample				Run: ICPMS2-C_140410B			04/11/14 01:27	
Uranium		ND	mg/filter	0.0014		70	130			S
-The LCS for this digestion was not spiked with the analytes of interest.										
Lab ID: **C14030856-003ADIL**		Serial Dilution				Run: ICPMS2-C_140410B			04/11/14 01:44	
Uranium		1.2E-10	mg/filter	1.5E-10		0	0		10	
Lab ID: **C14030856-008AMS4**		Sample Matrix Spike				Run: ICPMS2-C_140410B			04/11/14 02:13	
Uranium		0.27	mg/filter	0.0014	106	75	125			
Lab ID: **C14030856-008AMSD**		Sample Matrix Spike Duplicate				Run: ICPMS2-C_140410B			04/11/14 02:16	
Uranium		0.27	mg/filter	0.0014	107	75	125	0.8	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Report Date: 04/20/14
Project: 1st Quarter 2014 Comp
Work Order: C14030856

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Analytical Run: ICPMS2-C_140414A	
Lab ID: ICV		Initial Calibration Verification Standard							04/14/14 12:20	
Vanadium		0.0534	mg/L	0.0010	107	90	110			
Lab ID: ICSA		Interference Check Sample A							04/14/14 12:23	
Vanadium		-1.20E-06	mg/L	0.0010						
Lab ID: ICSAB		Interference Check Sample AB							04/14/14 12:26	
Vanadium		-0.000209	mg/L	0.0010						
Method: SW6020									Batch: 40981	
Lab ID: MB-40981		Method Blank				Run: ICPMS2-C_140414A			04/15/14 00:05	
Vanadium		0.0003	mg/filter	0.0002						
Lab ID: LCS2-40981		Laboratory Control Sample				Run: ICPMS2-C_140414A			04/15/14 00:08	
Vanadium		0.00023	mg/filter	0.10		70	130			S
-The LCS for this digestion was not spiked with the analytes of interest.										
Lab ID: C14030856-004ADIL		Serial Dilution				Run: ICPMS2-C_140414A			04/15/14 00:28	
Vanadium		0.068	mg/filter	0.10		0	0		10	
Lab ID: C14030856-006AMS4		Sample Matrix Spike				Run: ICPMS2-C_140414A			04/15/14 00:53	
Vanadium		0.35	mg/filter	0.10	96	75	125			
Lab ID: C14030856-006AMSD		Sample Matrix Spike Duplicate				Run: ICPMS2-C_140414A			04/15/14 00:5	
Vanadium		0.35	mg/filter	0.10	95	75	125	0.1	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

Workorder Receipt Checklist

Homestake Mining Co

C14030856

Login completed by: Debra Williams
Date Received: 3/31/2014

Reviewed by: BL2000\khelm
Received by: dw

Reviewed Date: 4/1/2014
Carrier name: NDA

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Applicable ☑
Container/Temp Blank temperature:	NA °C NA		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

Page _____ of _____

PLEASE PRINT (Provide as much information as possible.)

Company Name: HOMESTAKE Mining Co.	Project Name, PWS, Permit, Etc.: GRANTS	Sample Origin State:	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required): P.O. Box 98 GRANTS, N. Mex 87020	Contact Name: Adrian Venable	Phone/Fax: 1-505-287-4456 Ext. 28	Cell: / Sampler: (Please Print)
☐ No Hard Copy Email:	Invoice Contact & Phone:	Purchase Order:	Quote/Bottle Order:
Invoice Address (Required): SAME ☐ No Hard Copy Email:			

Special Report/Formats:
☐ DW ☐ EDD/EDT (Electronic Data) Format: _____
☐ POTW/WWTP ☐ LEVEL IV
☐ State: _____ ☐ NELAC
☐ Other: _____

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	TOTAL URANIUM	TOTAL Ra-226	TOTAL Th-230	TOTAL Uranium	SEE ATTACHED	Standard Turnaround (TAT)	RUSH	Comments:
1 HMC-1	1st		1-A	X	X	X	X				AIR Volume 1.34 Et 11
2 HMC-1-A	Quarter		1-A	X	X	X	X				Dup 1.61 Et 11
3 HMC-2	2014		1-A	X	X	X	X				MLS 1.29 Et 11
4 HMC-3	Comp		1-A	X	X	X	X				1.22 Et 11
5 HMC-4			1-A	X	X	X	X				1.13 Et 11 1.13 Et 11
6 HMC-5			1-A	X	X	X	X				1.24 Et 11
7 HMC-6			1-A	X	X	X	X				1.21 Et 11
8 HMC-7 Filter Comp			1-A	X	X	X	X	NO AIR Volume			———
9											
10											

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Shipped by: UPS-NDA
Cooler ID(s): Client
Receipt Temp: NA °C
On Ice: NA Y N
Custody Seal: On Bottle Y N / On Cooler Y N
Intact Y N
Signature Match Y N

LABORATORY USE ONLY
1403085

Custody Record MUST be Signed

Relinquished by (print): Adrian Venable	Date/Time: 3-28-2014	Signature:	Received by (print):	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client: _____ Lab Disposal: _____			Received by Laboratory:	Date/Time: 3-31-14	Signature:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

ENERGY LABORATORIES
www.energylab.com
Analytical Excellence Since 1952
Helena, MT 877-472-0711 • Billings, MT 800-735-4489 • Casper, WY 888-235-0515
Gillette, WY 866-686-7175 • Rapid City, SD 888-672-1225 • College Station, TX 888-690-2218

ANALYTICAL SUMMARY REPORT

July 26, 2014

Homestake Mining Co
Hwy 605
Grants, NM 87020

Work Order: C14070120 Quote ID: C775 - Hi-Vol Filters

Project Name: 2nd Quarter 2014 Comp

Energy Laboratories, Inc. Casper WY received the following 8 samples for Homestake Mining Co on 7/2/2014 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C14070120-001	HMC-1	06/30/14 00:00	07/02/14	Filter	Metals by ICP/ICPMS, Total Field Parameters Digestion, Total Metals RAD Alternate Unit Reporting Air Filters Radium 226 Thorium, Isotopic
C14070120-002	HMC-1A	06/30/14 00:00	07/02/14	Filter	Same As Above
C14070120-003	HMC-2	06/30/14 00:00	07/02/14	Filter	Same As Above
C14070120-004	HMC-3	06/30/14 00:00	07/02/14	Filter	Same As Above
C14070120-005	HMC-4	06/30/14 00:00	07/02/14	Filter	Same As Above
C14070120-006	HMC-5	06/30/14 00:00	07/02/14	Filter	Same As Above
C14070120-007	HMC-6	06/30/14 00:00	07/02/14	Filter	Same As Above
C14070120-008	HMC-7 Filter Comp	06/30/14 00:00	07/02/14	Filter	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

Acting Branch Manager

Digitally signed by
Steve Carlston
Date: 2014.07.26 18:35:04 -06:00

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-1

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-001	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2014	^{230}Th	3E-17	8E-18	5E-18	1E-16	3E-14	9E-02
Air Volume in mLs	^{226}Ra	3E-17	5E-18	4E-18	1E-16	9E-13	3E-03
1.34E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-001	^{nat}U	6.7E-15	N/A	N/A	1E-16	9E-14	7.4E+00
Second Quarter 2014	^{230}Th	9E-17	1E-17	5E-18	1E-16	3E-14	3E-01
Air Volume in mLs	^{226}Ra	2E-16	5E-18	2E-18	1E-16	9E-13	2E-02
1.28E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-001
Client Sample ID: HMC-1

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.18	mg/filter		0.10		SW6020	07/11/14 00:57 / clm
RADIONUCLIDES - IN AIR							
Radium 226	1.5E-16	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	5.0E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	2.0E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	9.2E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.5E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	4.8E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	6.7E-15	uCi/mL		4.1E-17		SW6020	07/11/14 00:57 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	19.7	pCi/Filter				RADCALC	07/26/14 17:56 / kbh
Radium 226 precision (±)	0.64	pCi/Filter				RADCALC	07/26/14 17:56 / kbh
Radium 226 MDC	0.26	pCi/Filter				RADCALC	07/26/14 17:56 / kbh
Thorium 230	11.8	pCi/Filter				RADCALC	07/26/14 17:56 / kbh
Thorium 230 precision (±)	1.9	pCi/Filter				RADCALC	07/26/14 17:56 / kbh
Thorium 230 MDC	0.62	pCi/Filter				RADCALC	07/26/14 17:56 / kbh
Uranium, Activity	854	pCi/Filter		0.20		RADCALC	07/26/14 17:56 / kbh
FIELD PARAMETERS							
Air Filtering Volume	128000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-1A

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-002	^{nat}U	8E-17	N/A	N/A	1E-16	9E-14	9E-02
First Quarter 2014	^{230}Th	2E-17	6E-18	4E-18	1E-16	3E-14	7E-02
Air Volume in mLs	^{226}Ra	2E-17	4E-18	4E-18	1E-16	9E-13	3E-03
1.61E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-002	^{nat}U	2.2E-15	N/A	N/A	1E-16	9E-14	2.4E+00
Second Quarter 2014	^{230}Th	7E-17	1E-17	6E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	1E-16	4E-18	2E-18	1E-16	9E-13	1E-02
1.21E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-002
Client Sample ID: HMC-1A

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.19	mg/filter		0.10		SW6020	07/11/14 01:00 / clm
RADIONUCLIDES - IN AIR							
Radium 226	1.2E-16	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	4.4E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	2.0E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	7.5E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.4E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	6.1E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	2.2E-15	uCi/mL		4.1E-17		SW6020	07/11/14 01:00 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	14.4	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 precision (±)	0.53	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 MDC	0.24	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230	9.1	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 precision (±)	1.7	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 MDC	0.73	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Uranium, Activity	261	pCi/Filter		0.20		RADCALC	07/26/14 18:07 / kbh
FIELD PARAMETERS							
Air Filtering Volume	121000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-2

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-003	^{nat}U	9E-17	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2014	^{230}Th	2E-17	7E-18	5E-18	1E-16	3E-14	8E-02
Air Volume in mLs	^{226}Ra	4E-17	5E-18	4E-18	1E-16	9E-13	4E-03
1.29E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-003	^{nat}U	1.4E-15	N/A	N/A	1E-16	9E-14	1.5E+00
Second Quarter 2014	^{230}Th	6E-17	1E-17	4E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	1E-16	4E-18	2E-18	1E-16	9E-13	1E-02
1.37E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-003
Client Sample ID: HMC-2

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.17	mg/filter		0.10		SW6020	07/11/14 01:03 / clm
RADIONUCLIDES - IN AIR							
Radium 226	1.2E-16	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	4.4E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	2.0E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	6.4E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.2E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	4.3E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	1.4E-15	uCi/mL		4.1E-17		SW6020	07/11/14 01:03 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	16.4	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 precision (±)	0.60	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 MDC	0.27	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230	8.8	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 precision (±)	1.6	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 MDC	0.59	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Uranium, Activity	190	pCi/Filter		0.20		RADCALC	07/26/14 18:07 / kbh
FIELD PARAMETERS							
Air Filtering Volume	137000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-3

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-004	^{nat}U	5E-16	N/A	N/A	1E-16	9E-14	5E-01
First Quarter 2014	^{230}Th	3E-17	8E-18	4E-18	1E-16	3E-14	1E-01
Air Volume in mLs	^{226}Ra	8E-17	7E-18	4E-18	1E-16	9E-13	9E-03
1.22E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-004	^{nat}U	7E-16	N/A	N/A	1E-16	9E-14	8E-01
Second Quarter 2014	^{230}Th	8E-17	1E-17	5E-18	1E-16	3E-14	3E-01
Air Volume in mLs	^{226}Ra	2E-16	5E-18	2E-18	1E-16	9E-13	2E-02
1.42E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-004
Client Sample ID: HMC-3

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.17	mg/filter		0.10		SW6020	07/11/14 01:09 / clm
RADIONUCLIDES - IN AIR							
Radium 226	1.7E-16	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	5.1E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	1.9E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	7.6E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.3E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	4.6E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	7.5E-16	uCi/mL		4.1E-17		SW6020	07/11/14 01:09 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	24.0	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 precision (±)	0.72	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 MDC	0.28	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230	10.8	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 precision (±)	1.8	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 MDC	0.65	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Uranium, Activity	106	pCi/Filter		0.20		RADCALC	07/26/14 18:07 / kbh
FIELD PARAMETERS							
Air Filtering Volume	142000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-4

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-005	^{nat}U	2E-16	N/A	N/A	1E-16	9E-14	2E-01
First Quarter 2014	^{230}Th	5E-17	9E-18	3E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	1E-16	8E-18	4E-18	1E-16	9E-13	1E-02
1.13E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-005	^{nat}U	1.1E-15	N/A	N/A	1E-16	9E-14	1.3E+00
Second Quarter 2014	^{230}Th	1E-16	2E-17	5E-18	1E-16	3E-14	4E-01
Air Volume in mLs	^{226}Ra	3E-16	6E-18	2E-18	1E-16	9E-13	3E-02
1.14E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-005
Client Sample ID: HMC-4

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.56	mg/filter		0.10		SW6020	07/11/14 01:12 / clm
RADIONUCLIDES - IN AIR							
Radium 226	2.8E-16	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	6.5E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	1.9E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	1.3E-16	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.9E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	4.5E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	1.1E-15	uCi/mL		4.1E-17		SW6020	07/11/14 01:12 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	32.5	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 precision (±)	0.74	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 MDC	0.22	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230	14.4	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 precision (±)	2.1	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 MDC	0.52	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Uranium, Activity	128	pCi/Filter		0.20		RADCALC	07/26/14 18:07 / kbh
FIELD PARAMETERS							
Air Filtering Volume	114000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-5

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-006	^{nat}U	2E-16	N/A	N/A	1E-16	9E-14	2E-01
First Quarter 2014	^{230}Th	3E-17	8E-18	4E-18	1E-16	3E-14	1E-01
Air Volume in mLs	^{226}Ra	7E-17	7E-18	4E-18	1E-16	9E-13	8E-03
1.24E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-006	^{nat}U	1.4E-15	N/A	N/A	1E-16	9E-14	1.5E+00
Second Quarter 2014	^{230}Th	5E-17	1E-17	5E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	9E-17	4E-18	2E-18	1E-16	9E-13	1E-02
1.29E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-006
Client Sample ID: HMC-5

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.19	mg/filter		0.10		SW6020	07/11/14 01:25 / clm
RADIONUCLIDES - IN AIR							
Radium 226	8.9E-17	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	3.8E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	2.0E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	4.9E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.0E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	5.0E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	1.4E-15	uCi/mL		4.1E-17		SW6020	07/11/14 01:25 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	11.5	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 precision (±)	0.50	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 MDC	0.26	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230	6.3	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 precision (±)	1.4	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 MDC	0.65	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Uranium, Activity	175	pCi/Filter		0.20		RADCALC	07/26/14 18:07 / kbh
FIELD PARAMETERS							
Air Filtering Volume	129000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-6

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-007	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2014	^{230}Th	4E-17	1E-17	5E-18	1E-16	3E-14	1E-01
Air Volume in mLs	^{226}Ra	3E-18	3E-18	4E-18	1E-16	9E-13	3E-04
1.21E+11							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-007	^{nat}U	1.8E-15	N/A	N/A	1E-16	9E-14	2.0E+00
Second Quarter 2014	^{230}Th	7E-17	1E-17	5E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	1E-16	4E-18	2E-18	1E-16	9E-13	1E-02
1.41E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-007
Client Sample ID: HMC-6

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	0.24	mg/filter		0.10		SW6020	07/11/14 01:28 / clm
RADIONUCLIDES - IN AIR							
Radium 226	1.2E-16	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	4.4E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	2.0E-18	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	6.9E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	1.3E-17	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	5.3E-18	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	1.8E-15	uCi/mL		4.1E-17		SW6020	07/11/14 01:28 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	17.1	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 precision (±)	0.62	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Radium 226 MDC	0.28	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230	9.7	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 precision (±)	1.8	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Thorium 230 MDC	0.75	pCi/Filter				RADCALC	07/26/14 18:07 / kbh
Uranium, Activity	252	pCi/Filter		0.20		RADCALC	07/26/14 18:07 / kbh
FIELD PARAMETERS							
Air Filtering Volume	141000000	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co
PROJECT: 2nd Quarter 2014 Comp
REPORT DATE: July 26, 2014

SAMPLE ID: HMC-7 Filter Comp

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14030856-008	^{nat}U	9E-18	N/A	N/A	1E-16	9E-14	1E-02
First Quarter 2014	^{230}Th	3E-18	2E-18	3E-18	1E-16	3E-14	1E-02
Air Volume in mLs	^{226}Ra	4E-17	5E-18	3E-18	1E-16	9E-13	5E-03
1.29E+11							

Air Volumes on this page based on average of quarterly set; accompanying standard report uses a 1 L default volume.

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C14070120-008	^{nat}U	2E-17	N/A	N/A	1E-16	9E-14	2E-02
Second Quarter 2014	^{230}Th	9E-18	4E-18	3E-18	1E-16	3E-14	3E-02
Air Volume in mLs	^{226}Ra	4E-18	1E-18	1E-18	1E-16	9E-13	4E-04
1.30E+11							

Air Volumes on this page based on average of quarterly set; accompanying standard report uses a 1 L default volume.

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp
Lab ID: C14070120-008
Client Sample ID: HMC-7 Filter Comp

Report Date: 07/26/14
Collection Date: 06/30/14
Date Received: 07/02/14
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	07/11/14 01:31 / clm
RADIONUCLIDES - IN AIR							
Radium 226	5.2E-10	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 precision (±)	1.4E-10	uCi/mL				E903.0	07/15/14 19:13 / dmf
Radium 226 MDC	1.9E-10	uCi/mL				E903.0	07/15/14 19:13 / dmf
Thorium 230	1.1E-09	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 precision (±)	4.6E-10	uCi/mL				E908.0	07/14/14 16:52 / dmf
Thorium 230 MDC	4.4E-10	uCi/mL				E908.0	07/14/14 16:52 / dmf
Uranium, Activity	2.8E-09	uCi/mL	D	9.6E-10		SW6020	07/11/14 01:31 / clm
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	0.52	pCi/Filter				RADCALC	07/22/14 06:59 / kbh
Radium 226 precision (±)	0.14	pCi/Filter				RADCALC	07/22/14 06:59 / kbh
Radium 226 MDC	0.19	pCi/Filter				RADCALC	07/22/14 06:59 / kbh
Thorium 230	1.1	pCi/Filter				RADCALC	07/22/14 06:59 / kbh
Thorium 230 precision (±)	0.46	pCi/Filter				RADCALC	07/22/14 06:59 / kbh
Thorium 230 MDC	0.44	pCi/Filter				RADCALC	07/22/14 06:59 / kbh
Uranium, Activity	2.8	pCi/Filter		0.20		RADCALC	07/22/14 06:59 / kbh
FIELD PARAMETERS							
Air Filtering Volume	1.0	L				FIELD	06/30/14 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp

Report Date: 07/26/14
Work Order: C14070120

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: R188757
Lab ID: C14070120-001AMS		Sample Matrix Spike				Run: G5000W_140709B				07/15/14 19:13
Radium 226		8.33E-07	pCi/L		90	70	130			
Lab ID: C14070120-001AMSD		Sample Matrix Spike Duplicate				Run: G5000W_140709B				07/15/14 19:13
Radium 226		9.18E-07	pCi/L		101	70	130	9.6	13.7	
Lab ID: LCS-41872		Laboratory Control Sample				Run: G5000W_140709B				07/15/14 19:13
Radium 226		21.2	pCi/L		97	80	120			
Lab ID: MB-41872	3	Method Blank				Run: G5000W_140709B				07/15/14 19:13
Radium 226		0.2	pCi/L							
Radium 226 precision (±)		0.08	pCi/L							
Radium 226 MDC		0.1	pCi/L							
Lab ID: MB-41884	3	Method Blank				Run: G5000W_140709B				07/16/14 07:19
Radium 226		0.05	pCi/L							U
Radium 226 precision (±)		0.07	pCi/L							
Radium 226 MDC		0.1	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp

Report Date: 07/26/14
Work Order: C14070120

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0										Batch: 41872
Lab ID: C14070120-008AMS		Sample Matrix Spike				Run: ALPHANALYST_140709A				07/14/14 16:52
Thorium 230		121	pCi/L		105	70	130			
Lab ID: C14070120-008AMSD		Sample Matrix Spike Duplicate				Run: ALPHANALYST_140709A				07/14/14 16:52
Thorium 230		120	pCi/L		105	70	130	0.7	30	
Lab ID: LCS-41872		Laboratory Control Sample				Run: ALPHANALYST_140709A				07/14/14 16:52
Thorium 230		28.1	pCi/L		102	80	120			
Lab ID: MB-41872	3	Method Blank				Run: ALPHANALYST_140709A				07/14/14 16:52
Thorium 230		0.3	pCi/L							
Thorium 230 precision (±)		0.2	pCi/L							
Thorium 230 MDC		0.2	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: 2nd Quarter 2014 Comp

Report Date: 07/26/14
Work Order: C14070120

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Analytical Run: ICPMS2-C_140710A	
Lab ID: ICV	2	Initial Calibration Verification Standard							07/10/14 13:24	
Uranium		0.0505	mg/L	0.00030	101	90	110			
Vanadium		0.0504	mg/L	0.0010	101	90	110			
Lab ID: ICSA	2	Interference Check Sample A							07/10/14 13:27	
Uranium		2.79E-05	mg/L	0.00030						
Vanadium		2.81E-05	mg/L	0.0010						
Lab ID: ICSAB	2	Interference Check Sample AB							07/10/14 13:30	
Uranium		7.10E-06	mg/L	0.00030						
Vanadium		-0.000318	mg/L	0.0010						
Method: SW6020									Batch: 41872	
Lab ID: MB-41872	2	Method Blank				Run: ICPMS2-C_140710A			07/11/14 00:48	
Uranium		ND	mg/filter	2E-05						
Vanadium		0.003	mg/filter	0.0002						
Lab ID: LCS2-41872	2	Laboratory Control Sample				Run: ICPMS2-C_140710A			07/11/14 00:51	
Uranium		0.098	mg/filter	0.0014	98	70	130			
Vanadium		0.10	mg/filter	0.10	100	70	130			
Lab ID: C14070120-003ADIL	2	Serial Dilution				Run: ICPMS2-C_140710A			07/11/14 01:06	
Uranium		2.9E-09	mg/filter	7.5E-11		0	0	2.6	10	
Vanadium		1.9E-09	mg/filter	0.10		0	0		10	
Lab ID: C14070120-008AMS4	2	Sample Matrix Spike				Run: ICPMS2-C_140710A			07/11/14 01:34	
Uranium		0.26	mg/filter	0.0014	104	75	125			
Vanadium		0.25	mg/filter	0.10	95	75	125			
Lab ID: C14070120-008AMSD	2	Sample Matrix Spike Duplicate				Run: ICPMS2-C_140710A			07/11/14 01:37	
Uranium		0.26	mg/filter	0.0014	103	75	125	0.1	20	
Vanadium		0.25	mg/filter	0.10	97	75	125	1.1	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

Workorder Receipt Checklist

Homestake Mining Co

C14070120

Login completed by: Corinne Wagner
Date Received: 7/2/2014
Reviewed by: BL2000\swaldrop
Received by: wc
Reviewed Date: 7/3/2014
Carrier name: Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Applicable ☑
Container/Temp Blank temperature:	N/A °C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

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PLEASE PRINT (Provide as much information as possible.)

Company Name: Home Stake mining Com.	Project Name, PWS, Permit, Etc: Grants	Sample Origin State:	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required): PO BOX 98 Grant's N.M 87020 ☐ No Hard Copy Email:	Contact Name: ADEN VEABLE Phone/Fax: 1505-287-4456 Ext 28	Cell:	Sampler: (Please Print)
Invoice Address (Required): Same ☐ No Hard Copy Email:	Invoice Contact & Phone:	Purchase Order:	Quote/Bottle Order:

Special Report/Formats:
☐ DW ☐ EDD/EDT (Electronic Data) Format:
☐ POTW/WWTP ☐ LEVEL IV
☐ State: ☐ NELAC
☐ Other:

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: USPS
Cooler ID(s): Clients
Receipt Temp: NA °C
On Ice: Y (N)
Custody Seal: On Bottle Y N; On Cooler Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Total - Uranium	Total - RA-226	Total - Th-230	Total - Vanadium	SEE ATTACHED		
1	Hmc - 1	2nd		1-A	X	X	X	X			Air Volume 1.28E11
2	Hmc - 1-A	Quarter		1-A	X	X	X	X			IN 1.21E11
3	Hmc - 2	2014		1-A	X	X	X	X			MLS 1.37E11 C1407012
4	Hmc - 3	Comp		1-A	X	X	X	X			1.42E11
5	Hmc - 4			1-A	X	X	X	X			1.14E11
6	Hmc - 5			1-A	X	X	X	X			5.70E11
7	Hmc - 6			1-A	X	X	X	X			1.41E11
8	Hmc - 7 Filter Comp			1-A	X	X	X	X		no Air	Volume
9											
10											

LABORATORY USE ONLY

Custody Record MUST be Signed

	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
1	WILLIAM ARCHULETA	6/26/14 15:00	William Archuleta			
2						
3				Received by Laboratory:	7-2-14	

Sample Disposal: Return to Client: Lab Disposal:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contrac will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional in on, downloadable fee schedule, forms, and links

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT (Provide as much information as possible.)

Company Name:	Project Name, PWS, Permit, Etc.	Sample Origin State:	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required):	Contact Name: Phone/Fax:	Cell:	Sampler: (Please Print)
☐ No Hard Copy Email:	Invoice Contact & Phone:	Purchase Order:	Quote/Bottle Order:
Invoice Address (Required): ☐ No Hard Copy Email:			

Special Report/Formats:
☐ DW ☐ POTW/WWTP ☐ State: ☐ Other: ☐ EDD/EDT (Electronic Data) Format: ☐ LEVEL IV ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

SEE ATTACHED

Standard Turnaround (TAT)

RUSH

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Shipped by:

Cooler ID(s):

Receipt Temp °C

On Ice: Y N

Custody Seal: On Bottle Y N; On Cooler Y N

Intact Y N

Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Total - Uranium	Total - RA-226	Total - Th-230	Total - [illegible]	Comments:
1	[illegible] - 1	[illegible]		1-A	X	X	X	X	A,R Volume 1.28E11
2	[illegible] - 1-A	[illegible]		1-A	X	X	X	X	IN 1.21E11
3	[illegible] - 2	[illegible]		1-A	X	X	X	X	7/23 1.37E11
4	[illegible] - 3	[illegible]		1-A	X	X	X	X	1.42E11
5	[illegible] - 4			1-A	X	X	X	X	1.4E11
6	[illegible] - 5			1-A	X	X	X	X	7-31 [illegible] 1.37E11 1.29E11
7	[illegible] - 6			1-A	X	X	X	X	1.41E11
8	[illegible] - [illegible]			1-A	X	X	X	X	[illegible]
9									
10									

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client:	Lab Disposal:		Received by Laboratory:	Date/Time: 7-3-14 08:58	Signature:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

Attachment 2 - Radon Gas Monitoring Results

Attachment 2 - Radon Gas Monitoring Results (Averages)

Track-Etch Passive Survey

Location	Monitoring Period	Rn Concentration (µCi/ml)	Error Estimate (µCi/ml)	% EC* (%)	LLD (µCi/ml)
Hi-Vol #1	1/6/14-6/30/14	7.3E-10	5.2E-11	7.3	3.4E-10
Hi-Vol #1-A	1/6/14-6/30/14	7.2E-10	9.3E-11	7.2	3.4E-10
Hi-Vol #2	1/6/14-6/30/14	7.7E-10	1.3E-10	7.7	3.4E-10
Hi-Vol #3	1/6/14-6/30/14	5.8E-10	4.1E-11	5.8	3.4E-10
Hi-Vol #4	1/6/14-6/30/14	1.1E-09	6.5E-11	10.7	3.4E-10
Hi-Vol #5	1/6/14-6/30/14	9.7E-10	6.2E-11	9.7	3.4E-10
Hi-Vol #6	1/6/14-6/30/14	6.8E-10	4.9E-11	6.8	3.4E-10
HMC #7	1/6/14-6/30/14	7.7E-10	5.3E-11	7.7	3.4E-10
HMC #16 Background	1/6/14-6/30/14	3.3E-10	3.0E-11	3.3	3.4E-10

*EC of 1E-8 µCi/ml for radon-222 with daughters removed as given in 10 CFR20, Appendix B, Table 2

Attachment 3 - Environmental Gamma Radiation Results

Attachment 3 - Environmental Gamma Radiation Results
OSL Perimeter Survey

Direct Radiation Measurements

Location	Monitoring Period	Exposure Rate (mrem/6 mo)	Error (mrem/6 mo)*
HMC #1 N Outer Perimeter	1/1/14 - 6/30/14	59	5.8
HMC #1-A N Outer Perimeter	1/1/14 - 6/30/14	54	5.3
HMC #2 NE Outer Perimeter	1/1/14 - 6/30/14	62	6.1
HMC #3 E Outer Perimeter	1/1/14 - 6/30/14	58	5.7
HMC #4 S Outer Perimeter	1/1/14 - 6/30/14	75	7.4
HMC #5 N of Nearest Residence	1/1/14 - 6/30/14	63	6.2
HMC #6 W of Outer Perimeter	1/1/14 - 6/30/14	70	6.9
#16 Background	1/1/14 - 6/30/14	55	5.4

*Error is 1.96 std. dev.

Table 2.1.1 – Water Quality Analysis for Well D1

Sampled on Annual Frequency
Not Sampled in First Half of 2014

Table 2.1.2 – Water Quality Analysis for Well S4

Sampled on Annual Frequency
Not Sampled in First Half of 2014

Table 2.1.3 – Water Quality Analysis for Well X

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C14020366-006
Client Sample ID: X

Report Date: 02/21/14
Collection Date: 02/11/14 10:55
Date Received: 02/13/14
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	96	mg/L		1		E300.0	02/13/14 20:09 / wc
108 Sulfate	298	mg/L	D	4		E300.0	02/13/14 20:09 / wc
PHYSICAL PROPERTIES							
009 pH	7.33	s.u.	H	0.01		A4500-H B	02/13/14 14:35 / tmm
010 Solids, Total Dissolved TDS @ 180 C	920	mg/L		10		A2540 C	02/13/14 15:44 / tmm
METALS - DISSOLVED							
036 Molybdenum	0.07	mg/L		0.03		E200.8	02/14/14 22:36 / clm
040 Selenium	0.013	mg/L		0.005		E200.8	02/14/14 22:36 / clm
015 Uranium	0.0496	mg/L		0.0003		E200.8	02/14/14 22:36 / clm
244 Uranium Precision (±)	0.00801	mg/L		0.00005		E200.8	02/14/14 22:36 / clm
113 Uranium, Activity	3.4E-08	uCi/mL		2.0E-10		E200.8	02/14/14 22:36 / clm
114 Uranium, Activity precision (±)	5.4E-09	uCi/mL		3.0E-11		E200.8	02/14/14 22:36 / clm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C14050021-005
Client Sample ID: X

Report Date: 05/07/14
Collection Date: 04/21/14 12:39
Date Received: 05/01/14
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	105	mg/L		1		E300.0	05/05/14 19:34 / wc
108 Sulfate	295	mg/L	D	2		E300.0	05/05/14 19:34 / wc
PHYSICAL PROPERTIES							
010 Solids, Total Dissolved TDS @ 180 C	910	mg/L	H	10		A2540 C	05/02/14 15:52 / alp
- The sample was received past the EPA-recommended holding time for TDS analysis.							
METALS - DISSOLVED							
036 Molybdenum	0.07	mg/L		0.03		E200.8	05/06/14 23:55 / clm
040 Selenium	0.009	mg/L		0.005		E200.8	05/06/14 23:55 / clm
015 Uranium	0.0420	mg/L		0.0003		E200.8	05/06/14 23:55 / clm
244 Uranium Precision (±)	0.00678	mg/L		0.00005		E200.8	05/06/14 23:55 / clm
113 Uranium, Activity	2.8E-08	uCi/mL		2.0E-10		E200.8	05/06/14 23:55 / clm
114 Uranium, Activity precision (±)	4.6E-09	uCi/mL		3.0E-11		E200.8	05/06/14 23:55 / clm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

Table 2.1.4 – Water Quality Analysis for Well P

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C14050686-008
Client Sample ID: P

Report Date: 06/09/14
Collection Date: 05/14/14 14:13
Date Received: 05/22/14
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS								
175	Alkalinity, Total as CaCO3	220	mg/L		5		A2320 B	05/22/14 23:27 / jba
206	Carbonate as CO3	<5	mg/L		5		A2320 B	05/22/14 23:27 / jba
505	Bicarbonate as HCO3	269	mg/L		5		A2320 B	05/22/14 23:27 / jba
001	Calcium	230	mg/L		0.5		E200.7	05/28/14 18:42 / sf
007	Chloride	52	mg/L		1		E300.0	05/23/14 17:54 / wc
002	Magnesium	47.3	mg/L		0.5		E200.7	05/28/14 18:42 / sf
310	Nitrogen, Nitrate+Nitrite as N	4.2	mg/L	D	0.2		E353.2	05/23/14 15:44 / lr
003	Potassium	4.8	mg/L		0.5		E200.7	05/28/14 18:42 / sf
004	Sodium	250	mg/L		0.5		E200.7	05/28/14 18:42 / sf
108	Sulfate	1020	mg/L	D	2		E300.0	05/23/14 17:54 / wc
PHYSICAL PROPERTIES								
009	pH	7.54	s.u.	H	0.01		A4500-H B	05/22/14 16:32 / alp
010	Solids, Total Dissolved TDS @ 180 C	1790	mg/L	H	18		A2540 C	05/23/14 14:25 / alp
	- The sample was received past the EPA-recommended holding time for TDS analysis.							
METALS - DISSOLVED								
036	Molybdenum	<0.03	mg/L		0.03		E200.7	05/28/14 18:42 / sf
040	Selenium	0.123	mg/L		0.005		E200.8	06/04/14 20:33 / clm
015	Uranium	0.0340	mg/L		0.0003		E200.8	06/04/14 20:33 / clm
244	Uranium Precision (±)	0.00548	mg/L		0.00005		E200.8	06/04/14 20:33 / clm
113	Uranium, Activity	2.3E-08	uCi/mL		2.0E-10		E200.8	06/04/14 20:33 / clm
114	Uranium, Activity precision (±)	3.7E-09	uCi/mL		3.0E-11		E200.8	06/04/14 20:33 / clm
042	Vanadium	<0.01	mg/L		0.01		E200.7	05/28/14 18:42 / sf
RADIONUCLIDES - DISSOLVED								
045	Radium 226	0.82	pCi/L				E903.0	06/03/14 05:59 / trs
245	Radium 226 precision (±)	0.25	pCi/L				E903.0	06/03/14 05:59 / trs
	Radium 226 MDC	0.25	pCi/L				E903.0	06/03/14 05:59 / trs
256	Radium 226 altu	8.0E-10	uCi/mL				E903.0	06/03/14 05:59 / trs
258	Radium 226 altu precision (±)	3.0E-10	uCi/mL				E903.0	06/03/14 05:59 / trs
	Radium 226 altu MDC	3.0E-10	uCi/mL				E903.0	06/03/14 05:59 / trs
057	Radium 228	0.7	pCi/L	U			RA-05	05/29/14 12:07 / plj
257	Radium 228 precision (±)	1.1	pCi/L				RA-05	05/29/14 12:07 / plj
	Radium 228 MDC	1.7	pCi/L				RA-05	05/29/14 12:07 / plj
359	Radium 228 altu	7.0E-10	uCi/mL	U			RA-05	05/29/14 12:07 / plj
360	Radium 228 altu precision (±)	1.0E-09	uCi/mL				RA-05	05/29/14 12:07 / plj
	Radium 228 altu MDC	2.0E-09	uCi/mL				RA-05	05/29/14 12:07 / plj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.