HOMESTAKE
Grants Project

Alan D. Cox
Project Manager – Grants

30 August 2005

UPS Next Day Air:

Mr. Bill Von Till, Site Manager
c/o Document Control Desk
Chief of Fuel Cycle Facilities Branch (Mailstop T8-A33)
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Materials Safety and Safeguards
U. S. Nuclear Regulatory Commission
11545 Rockville Pike
Two White Flint North
Rockville, MD 20852-2738

RE: **Docket No. 40-8903**
License No. SUA-1471
Semi-Annual Environmental Monitoring Report
Period – January through June 2005

Dear Mr. Von Till:

Pursuant to US Nuclear Regulatory Commission Regulation 10 CFR 40.85 and Part 20, Homestake Mining Company of California hereby submits two (2) copies of their semi-annual report for the first-half of 2005 (January through June) for the Homestake Grants Reclamation Project.

Groundwater data for the project is filed with the year-end semi-annual report pursuant to our current NRC license condition LC-15.

The 600-gpm reverse osmosis (RO) plant operated at an average rate of 266-gpms during the January through June 2005 reporting period. Operating rates for the plant are related to the existing evaporation pond storage volume capacities and associated seasonal forced evaporative spray systems on Evaporations ponds #1 and #2.

Thank you for your time and attention on this matter. If you have any questions or require additional information, please contact me at the Grants office (505) 287-4456, ext. 25 or via cell phone at (505) 400-2794.

Sincerely yours,

HOMESTAKE MINING COMPANY OF CALIFORNIA
Alan D. Cox

Enclosures (2)

xc: Mr. B. Spitzberg, Chief, Decommissioning Branch, w/enclosure
Mr. R. Chase, Barrick - SLC, w/enclosure
Mr. G. Hoffman, Hydro Engineering - Casper w/enclosure
Mr. S. Appaji, Region VI EPA - Dallas w/enclosure

NMSSO1
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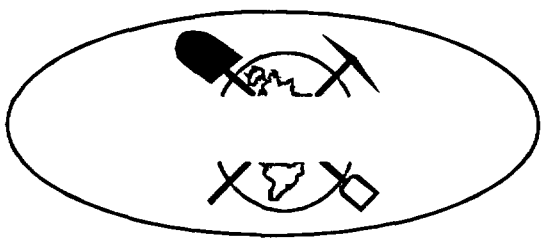
HOMESTAKE MINING COMPANY OF CALIFORNIA GRANTS PROJECT



SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT

JANUARY – JUNE

2005

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 2005. 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 266-gpm while producing an average of 185-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 will be included in the second half semi-annual environmental monitoring report. It should be noted that while the POC wells will eventually be used to demonstrate groundwater restoration, they are not 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 six locations around the reclamation site (see Figure 1). Those locations identified as HMC-1, 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. The location identified as HMC-6 represents background conditions, and is located due 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. The results are presented in Attachment 1.

Homestake uses a Sierra Instruments Model #305-200 High Volume Air Samplers (or equivalent) to continuously sample the ambient air of 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, and Thorium-230.

2.2 Radon Gas Monitoring

Radon gas concentrations are monitored on a continuous basis at the eight 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. Semi-annually 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 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 frequency 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, will be included in the July - December Semi-Annual Environmental Report.

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 seven 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 seven 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 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. Homestake has not exceeded 10 CFR Part 20 values in any of their effluents monitored during the period 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	3	HMC1, HMC2, HMC3 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
	2	HMC4, HMC5 at 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
	1	HMC6 background location	Continuous (High Vol.)	Weekly filter change, or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230
Radon Gas	8	Locations described in Air - Particulates & HMC7 on S boundary & HMC16 as a background	Continuous Track-etch	Semi-Annual	Rn-222
DIRECT RADIATION	7	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

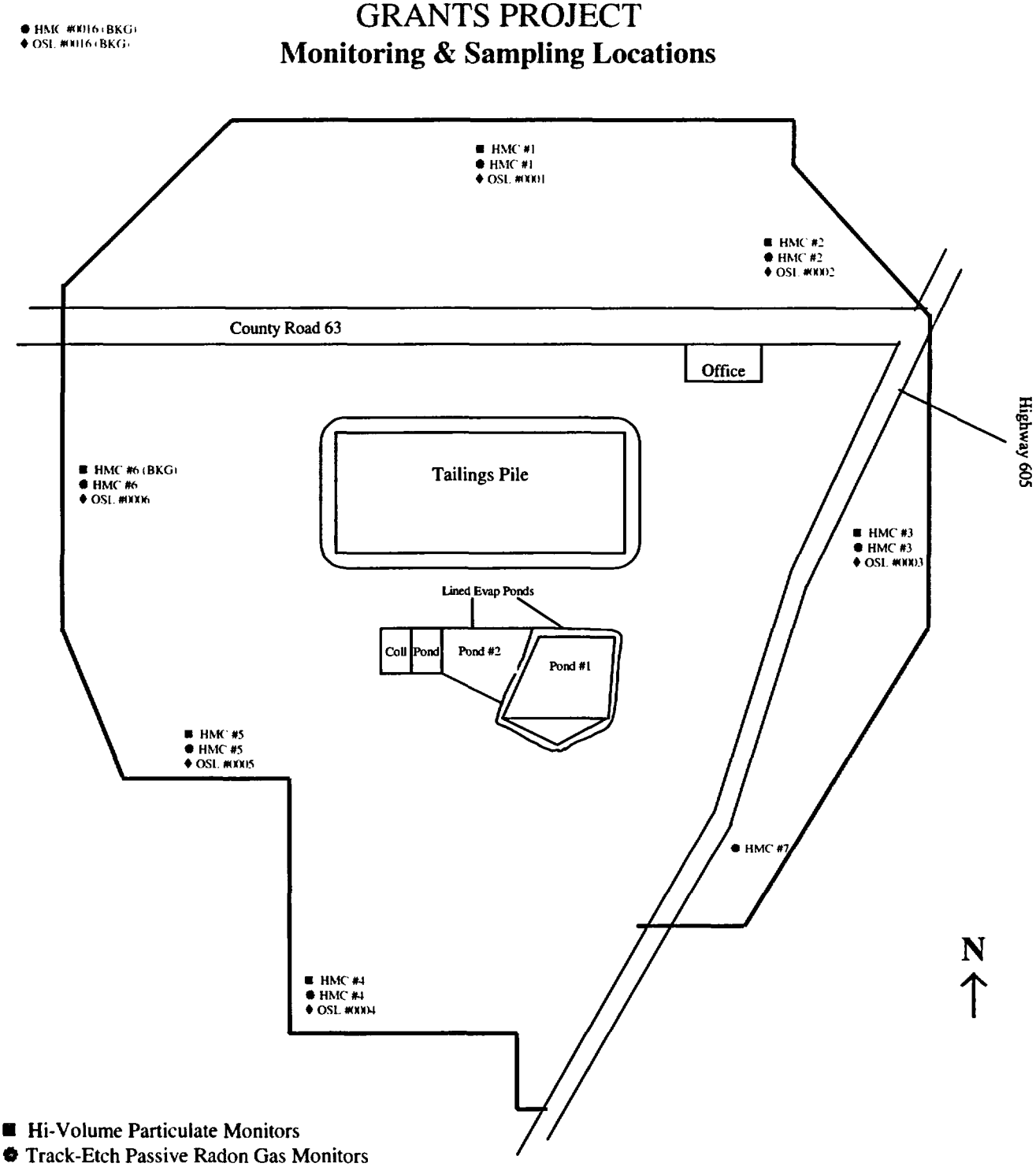
Table 3 – Occupational Monitoring Program

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

HOMESTAKE MINING COMPANY
GRANTS PROJECT
Monitoring & Sampling Locations



■ Hi-Volume Particulate Monitors
● Track-Etch Passive Radon Gas Monitors
♦ OSL Gamma Badges

FIGURE 1

Attachment 1 – High Volume Air Sampling Results

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LABORATORY ANALYTICAL REPORT

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp
Lab ID: C05040073-001
Client Sample ID: HMC-1 Hi-Vol Filter Comp

Report Date: 04/19/05
Collection Date: Not Provided
Date Received: 04/04/05
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	4.0	pCi/Filter	D	0.4		E903.0	04/11/05 12:45 / df
Radium 226 precision (±)	1.9	pCi/Filter				E903.0	04/11/05 12:45 / df
Thorium 230	1.4	pCi/Filter	D	0.4		E907.0	04/08/05 10:30 / ph
Thorium 230 precision (±)	0.6	pCi/Filter				E907.0	04/08/05 10:30 / ph
Uranium, Activity	16.7	pCi/Filter	D	0.4		SW6020	04/07/05 22:49 / bws

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

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LABORATORY ANALYTICAL REPORT

Revised Date: 08/08/05

Client: Homestake Mining Company
Report Date: 07/25/05
Project: 2nd Quarter 2005 Comp
Collection Date: Not Provided
Lab ID: C05070041-001
Date Received: 07/01/05
Client Sample ID: HMC-1 Hi Vol Filter Comp
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	13	pCi/Filter		0.2		E903.0	07/10/05 13:40 / df
Radium 226 precision (±)	2.7	pCi/Filter				E903.0	07/10/05 13:40 / df
Thorium 230	10.8	pCi/Filter		0.2		E907.0	07/12/05 10:30 / ph
Thorium 230 precision (±)	2.1	pCi/Filter				E907.0	07/12/05 10:30 / ph
Uranium, Activity	275	pCi/Filter		0.2		SW6020	07/11/05 22:23 / bws

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: HOMESTAKE MINING COMPANY - GRANTS, NEW MEXICO

REPORT DATE: July 25, 2005

SAMPLE ID: HMC 1

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05040073-001	^{nat}U	1.10E-16	N/A	1.00E-16	9.00E-14	1.22E-01
First Quarter 2005	^{230}Th	< 1.00E-16	3.95E-18	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.52E+11	^{226}Ra	< 1.00E-16	1.26E-17	1.00E-16	9.00E-13	< 1.11E-02

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05070041-001	^{nat}U	1.96E-15	N/A	1.00E-16	9.00E-14	2.18E+00
Second Quarter 2005	^{230}Th	< 1.00E-16	1.49E-17	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.40E+11	^{226}Ra	< 1.00E-16	1.89E-17	1.00E-16	9.00E-13	< 1.11E-02

N/A not applicable for ICP-MS
LLD = Lower Limit of Detection per Regulatory Guide 4.14
All LLDs were met
*Effluent Concentrations per 10 CFR Part 20 Appendix B Table 2, Effluent Concentration

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LABORATORY ANALYTICAL REPORT

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp
Lab ID: C05040073-002
Client Sample ID: HMC-2 Hi-Vol Filter Comp

Report Date: 04/19/05
Collection Date: Not Provided
Date Received: 04/04/05
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	6.4	pCi/Filter	D	0.4		E903.0	04/11/05 12:45 / df
Radium 226 precision (±)	2.2	pCi/Filter				E903.0	04/11/05 12:45 / df
Thorium 230	3.2	pCi/Filter	D	0.4		E907.0	04/08/05 10:30 / ph
Thorium 230 precision (±)	1.0	pCi/Filter				E907.0	04/08/05 10:30 / ph
Uranium, Activity	12.1	pCi/Filter	D	0.4		SW6020	04/07/05 22:52 / bws

Report Definitions:
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D - RL increased due to sample matrix interference.
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LABORATORY ANALYTICAL REPORT

Revised Date: 08/08/05
Report Date: 07/25/05
Collection Date: Not Provided
Date Received: 07/01/05
Matrix: Filter

Client: Homestake Mining Company
Project: 2nd Quarter 2005 Comp
Lab ID: C05070041-002
Client Sample ID: HMC-2 Hi Vol Filter Comp

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	10	pCi/Filter		0.2		E903.0	07/10/05 13:40 / df
Radium 226 precision (±)	2.5	pCi/Filter				E903.0	07/10/05 13:40 / df
Thorium 230	16.1	pCi/Filter		0.2		E907.0	07/12/05 10:30 / ph
Thorium 230 precision (±)	3.6	pCi/Filter				E907.0	07/12/05 10:30 / ph
Uranium, Activity	248	pCi/Filter		0.2		SW6020	07/11/05 22:49 / bws

Report Definitions:
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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: HOMESTAKE MINING COMPANY - GRANTS, NEW MEXICO

REPORT DATE: July 25, 2005

SAMPLE ID: HMC 2

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05040073-002	^{nat}U	< 1.00E-16	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2005	^{230}Th	< 1.00E-16	6.10E-18	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.64E+11	^{226}Ra	< 1.00E-16	1.34E-17	1.00E-16	9.00E-13	< 1.11E-02

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05070041-002	^{nat}U	1.75E-15	N/A	1.00E-16	9.00E-14	1.94E+00
Second Quarter 2005	^{230}Th	1.13E-16	2.53E-17	1.00E-16	2.00E-14	5.66E-01
Air Volume in mLs 1.42E+11	^{226}Ra	< 1.00E-16	1.73E-17	1.00E-16	9.00E-13	< 1.11E-02

N/A not applicable for ICP-MS
LLD = Lower Limit of Detection per Regulatory Guide 4.14
All LLDs were met
*Effluent Concentrations per 10 CFR Part 20 Appendix B Table 2, Effluent Concentration

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LABORATORY ANALYTICAL REPORT

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp
Lab ID: C05040073-003
Client Sample ID: HMC-3 Hi-Vol Filter Comp

Report Date: 04/19/05
Collection Date: Not Provided
Date Received: 04/04/05
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	6.0	pCi/Filter	D	0.4		E903.0	04/11/05 12:45 / df
Radium 226 precision (±)	2.2	pCi/Filter				E903.0	04/11/05 12:45 / df
Thorium 230	1.8	pCi/Filter	D	0.4		E907.0	04/08/05 10:30 / ph
Thorium 230 precision (±)	0.8	pCi/Filter				E907.0	04/08/05 10:30 / ph
Uranium, Activity	43.8	pCi/Filter	D	0.4		SW6020	04/07/05 22:56 / bws

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

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LABORATORY ANALYTICAL REPORT

Revised Date: 08/08/05
Report Date: 07/25/05
Collection Date: Not Provided
Date Received: 07/01/05
Matrix: Filter

Client: Homestake Mining Company
Project: 2nd Quarter 2005 Comp
Lab ID: C05070041-003
Client Sample ID: HMC-3 Hi Vol Filter Comp

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	11	pCi/Filter		0.2		E903.0	07/10/05 13:40 / df
Radium 226 precision (±)	2.5	pCi/Filter				E903.0	07/10/05 13:40 / df
Thorium 230	18.1	pCi/Filter		0.2		E907.0	07/12/05 10:30 / ph
Thorium 230 precision (±)	3.4	pCi/Filter				E907.0	07/12/05 10:30 / ph
Uranium, Activity	1880	pCi/Filter		0.2		SW6020	07/11/05 22:56 / bws

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

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: HOMESTAKE MINING COMPANY - GRANTS, NEW MEXICO

REPORT DATE: July 25, 2005

SAMPLE ID: HMC 3

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05040073-003	^{nat}U	2.67E-16	N/A	1.00E-16	9.00E-14	2.97E-01
First Quarter 2005	^{230}Th	< 1.00E-16	4.88E-18	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.64E+11	^{226}Ra	< 1.00E-16	1.34E-17	1.00E-16	9.00E-13	< 1.11E-02

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05070041-003	^{nat}U	1.38E-14	N/A	1.00E-16	9.00E-14	1.54E+01
Second Quarter 2005	^{230}Th	1.33E-16	2.50E-17	1.00E-16	2.00E-14	6.67E-01
Air Volume in mLs 1.36E+11	^{226}Ra	< 1.00E-16	1.81E-17	1.00E-16	9.00E-13	< 1.11E-02

N/A not applicable for ICP-MS
LLD = Lower Limit of Detection per Regulatory Guide 4.14
All LLDs were met
*Effluent Concentrations per 10 CFR Part 20 Appendix B Table 2, Effluent Concentration

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LABORATORY ANALYTICAL REPORT

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp
Lab ID: C05040073-004
Client Sample ID: HMC-4 Hi-Vol Filter Comp

Report Date: 04/19/05
Collection Date: Not Provided
Date Received: 04/04/05
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	4.1	pCi/Filter	D	0.4		E903.0	04/11/05 12:45 / df
Radium 226 precision (±)	1.9	pCi/Filter				E903.0	04/11/05 12:45 / df
Thorium 230	1.6	pCi/Filter	D	0.4		E907.0	04/08/05 10:30 / ph
Thorium 230 precision (±)	0.6	pCi/Filter				E907.0	04/08/05 10:30 / ph
Uranium, Activity	22.8	pCi/Filter	D	0.4		SW6020	04/07/05 23:03 / bws

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

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LABORATORY ANALYTICAL REPORT

Revised Date: 08/08/05
Report Date: 07/25/05
Collection Date: Not Provided
Date Received: 07/01/05
Matrix: Filter

Client: Homestake Mining Company
Project: 2nd Quarter 2005 Comp
Lab ID: C05070041-004
Client Sample ID: HMC-4 Hi Vol Filter Comp

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	7.6	pCi/Filter		0.2		E903.0	07/10/05 13:40 / df
Radium 226 precision (±)	2.2	pCi/Filter				E903.0	07/10/05 13:40 / df
Thorium 230	13.2	pCi/Filter		0.2		E907.0	07/12/05 10:30 / ph
Thorium 230 precision (±)	2.8	pCi/Filter				E907.0	07/12/05 10:30 / ph
Uranium, Activity	1260	pCi/Filter		0.2		SW6020	07/11/05 23:29 / bws

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

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: HOMESTAKE MINING COMPANY - GRANTS, NEW MEXICO

REPORT DATE: July 25, 2005

SAMPLE ID: HMC 4

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05040073-004	^{nat}U	1.42E-16	N/A	1.00E-16	9.00E-14	1.57E-01
First Quarter 2005	^{230}Th	< 1.00E-16	3.73E-18	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.61E+11	^{226}Ra	< 1.00E-16	1.19E-17	1.00E-16	9.00E-13	< 1.11E-02

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05070041-004	^{nat}U	8.93E-15	N/A	1.00E-16	9.00E-14	9.93E+00
Second Quarter 2005	^{230}Th	< 1.00E-16	2.01E-17	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.41E+11	^{226}Ra	< 1.00E-16	1.61E-17	1.00E-16	9.00E-13	< 1.11E-02

N/A not applicable for ICP-MS
LLD = Lower Limit of Detection per Regulatory Guide 4.14
All LLDs were met
*Effluent Concentrations per 10 CFR Part 20 Appendix B Table 2, Effluent Concentration

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LABORATORY ANALYTICAL REPORT

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp
Lab ID: C05040073-005
Client Sample ID: HMC-5 Hi-Vol Filter Comp

Report Date: 04/19/05
Collection Date: Not Provided
Date Received: 04/04/05
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	2.4	pCi/Filter	D	0.4		E903.0	04/11/05 12:45 / df
Radium 226 precision (±)	1.7	pCi/Filter				E903.0	04/11/05 12:45 / df
Thorium 230	1.0	pCi/Filter	D	0.4		E907.0	04/08/05 10:30 / ph
Thorium 230 precision (±)	0.6	pCi/Filter				E907.0	04/08/05 10:30 / ph
Uranium, Activity	30.5	pCi/Filter	D	0.4		SW6020	04/07/05 23:07 / bws

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

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LABORATORY ANALYTICAL REPORT

Revised Date: 08/08/05
Report Date: 07/25/05
Collection Date: Not Provided
Date Received: 07/01/05
Matrix: Filter

Client: Homestake Mining Company
Project: 2nd Quarter 2005 Comp
Lab ID: C05070041-005
Client Sample ID: HMC-5 Hi Vol Filter Comp

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	10	pCi/Filter		0.2		E903.0	07/10/05 13:40 / df
Radium 226 precision (±)	2.4	pCi/Filter				E903.0	07/10/05 13:40 / df
Thorium 230	20.0	pCi/Filter		0.2		E907.0	07/12/05 10:30 / ph
Thorium 230 precision (±)	3.0	pCi/Filter				E907.0	07/12/05 10:30 / ph
Uranium, Activity	3070	pCi/Filter		0.2		SW6020	07/11/05 23:36 / bws

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

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: HOMESTAKE MINING COMPANY - GRANTS, NEW MEXICO

REPORT DATE: July 25, 2005

SAMPLE ID: HMC 5

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05040073-005	^{nat}U	1.50E-16	N/A	1.00E-16	9.00E-14	1.66E-01
First Quarter 2005	^{230}Th	< 1.00E-16	2.96E-18	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 2.03E+11	^{226}Ra	< 1.00E-16	8.18E-18	1.00E-16	9.00E-13	< 1.11E-02

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05070041-005	^{nat}U	2.15E-14	N/A	1.00E-16	9.00E-14	2.39E+01
Second Quarter 2005	^{230}Th	1.40E-16	2.11E-17	1.00E-16	2.00E-14	7.00E-01
Air Volume in mLs 1.43E+11	^{226}Ra	< 1.00E-16	1.72E-17	1.00E-16	9.00E-13	< 1.11E-02

N/A not applicable for ICP-MS
LLD = Lower Limit of Detection per Regulatory Guide 4.14
All LLDs were met
*Effluent Concentrations per 10 CFR Part 20 Appendix B Table 2, Effluent Concentration

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LABORATORY ANALYTICAL REPORT

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp
Lab ID: C05040073-006
Client Sample ID: HMC-6 Hi-Vol Filter Comp

Report Date: 04/19/05
Collection Date: Not Provided
Date Received: 04/04/05
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	6.4	pCi/Filter	D	0.4		E903.0	04/11/05 12:45 / df
Radium 226 precision (±)	2.2	pCi/Filter				E903.0	04/11/05 12:45 / df
Thorium 230	1.0	pCi/Filter	D	0.4		E907.0	04/08/05 10:30 / ph
Thorium 230 precision (±)	0.6	pCi/Filter				E907.0	04/08/05 10:30 / ph
Uranium, Activity	8.9	pCi/Filter	D	0.4		SW6020	04/07/05 23:10 / bws

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

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LABORATORY ANALYTICAL REPORT

Revised Date: 08/08/05
Report Date: 07/25/05
Collection Date: Not Provided
Date Received: 07/01/05
Matrix: Filter

Client: Homestake Mining Company
Project: 2nd Quarter 2005 Comp
Lab ID: C05070041-006
Client Sample ID: HMC-6 Hi Vol Filter Comp

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Radium 226	66	pCi/Filter		0.2		E903.0	07/10/05 13:40 / df
Radium 226 precision (±)	5.8	pCi/Filter				E903.0	07/10/05 13:40 / df
Thorium 230	13.8	pCi/Filter		0.2		E907.0	07/12/05 10:30 / ph
Thorium 230 precision (±)	2.3	pCi/Filter				E907.0	07/12/05 10:30 / ph
Uranium, Activity	397	pCi/Filter		0.2		SW6020	07/11/05 23:43 / bws

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

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: HOMESTAKE MINING COMPANY - GRANTS, NEW MEXICO

REPORT DATE: July 25, 2005

SAMPLE ID: HMC 6

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05040073-006	^{nat}U	< 1.00E-16	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2005	^{230}Th	< 1.00E-16	3.77E-18	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.59E+11	^{226}Ra	< 1.00E-16	1.38E-17	1.00E-16	9.00E-13	< 1.11E-02

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Error Estimate µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C05070041-006	^{nat}U	2.81E-15	N/A	1.00E-16	9.00E-14	3.13E+00
Second Quarter 2005	^{230}Th	< 1.00E-16	1.61E-17	1.00E-16	2.00E-14	< 5.00E-01
Air Volume in mLs 1.41E+11	^{226}Ra	4.66E-16	4.16E-17	1.00E-16	9.00E-13	5.18E-02

N/A not applicable for ICP-MS
LLD = Lower Limit of Detection per Regulatory Guide 4.14
All LLDs were met
*Effluent Concentrations per 10 CFR Part 20 Appendix B Table 2, Effluent Concentration

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QA/QC Summary Report

Client: Homestake Mining Company
Project: 1st Quarter 2005 Comp

Report Date: 04/19/05
Work Order: C05040073

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0									Batch: RA226-0978
Sample ID: C05031115-001AMS	Matrix Spike								04/11/05 12:45
Radium 226	42.7	pCi/Filter	0.20	96.2	70	130			
Sample ID: C05031115-001AMSD	Matrix Spike Duplicate								04/11/05 12:45
Radium 226	40.4	pCi/Filter	0.20	90	70	130	5.7	26.8	
Sample ID: MB-RA226-0978	Method Blank								04/11/05 12:45
Radium 226	ND	pCi/Filter	0.2						
Sample ID: LCS-RA226-0978	Laboratory Control Spike								04/11/05 12:45
Radium 226	16.3	pCi/Filter	0.20	108	70	130			
Method: E907.0									Batch: 7632
Sample ID: MB-R48820	Method Blank								04/08/05 10:30
Thorium 230	ND	pCi/Filter	0.2						
Sample ID: LCS-R48820	Laboratory Control Spike								04/08/05 10:30
Thorium 230	26.0	pCi/Filter	0.20	104	70	130			
Method: SW6020									Batch: 7632
Sample ID: MB-7632	Method Blank								04/07/05 22:16
Uranium, Activity	0.4	pCi/Filter	0.08						
Sample ID: C05040071-001AMS	Matrix Spike								04/07/05 22:23
Uranium	1.29	mg/filter	0.0012	119	75	125			
Sample ID: C05040071-001AMSD	Matrix Spike Duplicate								04/07/05 22:41
Uranium	1.26	mg/filter	0.0012	116	75	125	2.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

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QA/QC Summary Report

Revised Date: 08/08/05
Report Date: 07/25/05
Work Order: C05070041

Client: Homestake Mining Company
Project: 2nd Quarter 2005 Comp

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0									Batch: RA226-1123
Sample ID: C05070041-004ADUP	Sample Duplicate								07/10/05 13:40
Radium 226	8.34	pCi/Filter	0.20				9.3	65.4	
Sample ID: C05070041-005AMS	Matrix Spike								07/10/05 13:40
Radium 226	68.7	pCi/Filter	0.20	97.9	70	130			
Sample ID: MB-RA226-1123	Method Blank								07/10/05 13:40
Radium 226	ND	pCi/Filter	0.2						
Sample ID: LCS-RA226-1123	Laboratory Control Spike								07/10/05 13:40
Radium 226	12.1	pCi/Filter	0.20	95.1	70	130			
Method: E907.0									Batch: 8448
Sample ID: MB-R52726	Method Blank								07/12/05 10:30
Thorium 230	ND	pCi/filter	0.2						
Sample ID: LCS-R52726	Laboratory Control Spike								07/12/05 10:30
Thorium 230	25	pCi/filter	0.20	98.8	70	130			
Method: SW6020									Batch: 8448
Sample ID: MB-8448	Method Blank								07/11/05 22:03
Uranium	0.0003	mg/filter	0.00006						
Sample ID: LCS1-8448	Laboratory Control Spike - Low								07/11/05 22:09
Uranium	0.0522	mg/filter	0.00030	104	75	125			
Sample ID: C05070041-001AMS	Matrix Spike								07/11/05 22:29
Uranium	0.902	mg/filter	0.00030	99.3	75	125			
Sample ID: C05070041-001AMSD	Matrix Spike Duplicate								07/11/05 22:36
Uranium	0.887	mg/filter	0.00030	96.2	75	125	1.7	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Attachment 2 - Radon Gas Monitoring Results

Attachment 2 - Radon Gas Monitoring Results
Track-Etch Passive Survey

Location	Monitoring Period	Rn Concentration (µCi/ml)	Error Estimate (µCi/ml)	% Limit* (%)	LLD (µCi/ml)
Hi-Vol #1 N Outer Perimeter	12/17/2004 - 6/30/2005	1.2E-09	1.4E-10	12	1.5E-10
Hi-Vol #2 NE Outer Perimeter	12/17/2004 - 6/30/2005	1.8E-09	1.8E-10	18	1.5E-10
Hi-Vol #3 E Outer Perimeter	12/17/2004 - 6/30/2005	9.0E-10	1.2E-10	9	1.5E-10
Hi-Vol #4 S Outer Perimeter	12/17/2004 - 6/30/2005	1.8E-09	1.8E-10	18	1.5E-10
Hi-Vol #5 N of Nearest Residence	12/17/2004 - 6/30/2005	1.4E-09	1.5E-10	14	1.5E-10
Hi-Vol #6 W of Outer Perimeter	12/17/2004 - 6/30/2005	1.4E-09	1.5E-10	14	1.5E-10
HMC #7 S Boundary	12/17/2004 - 6/30/2005	1.3E-09	1.5E-10	13	1.5E-10
HMC #16 Background	12/17/2004 - 6/30/2005	1.2E-09	1.4E-10	12	1.5E-10

*Limit 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)*
Hi-Vol #1 N Outer Perimeter	1/1/2005 - 6/30/2005	10	1.0
Hi-Vol #2 NE Outer Perimeter	1/1/2005 - 6/30/2005	21	2.1
Hi-Vol #3 E Outer Perimeter	1/1/2005 - 6/30/2005	15	1.5
Hi-Vol #4 S Outer Perimeter	1/1/2005 - 6/30/2005	17	1.7
Hi-Vol #5 N of Nearest Residence	1/1/2005 - 6/30/2005	20	2.0
Hi-Vol #6 W of Outer Perimeter	1/1/2005 - 6/30/2005	21	2.1
#16 Background	1/1/2005 - 6/30/2005	12	1.2

*Error is 1.96 std. dev.