From: "Cox, Al (Grants)" <ACox@barrick.com>
To: <pxm2@nrc.gov>
Date: 5/10/06 3:02PM
Subject: GRANTS - Radon Flux Surveys - 2003, 04, 05 – Homestake - 40-8907

Paul,
As discussed over the telephone, attached are copies of the annual radon flux surveys for 2003, 2004 and 2005. Please note that in 2004 we provided some remedial interim cover to a portion of the top of the Large Tailings Pile and re-sampled the area to assure that the LTP met the 20 pCi/M2s average level.

If you have any questions, please let me know. We will include the upcoming 2006 flux survey in with the annual performance review report. If you need hard copies of the attached surveys sent to you, please advise by return e-mail or give me a call.

Thanks for your cooperation on this issue!.....Al
\
Alan D. Cox
Project Manager
Homestake Mining Co. of Calif.
P.O. Box 98 Hwy. 605
Grants, NM 87020
Tele: (505) 287-4456 Ext. 25
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Subject:	GRANTS - Radon Flux Surveys - 2003, 04, 05
Creation Date:	5/10/06 2:56PM
From:	"Cox, Al (Grants)" <ACox@barrick.com>
Created By:	ACox@barrick.com

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MESSAGE	794	05/10/06 02:56PM
TEXT.htm	2260	
Radon Flux 2003.PDF	1097045	
Radon Flux remedial 2004.PDF	86485	
Radon Flux 2004.PDF	744779	
Flux 2005 report.pdf	63545	
Mime.822	2732122	

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Expiration Date:	None
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Reply Requested:	No
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Security:	Standard

Environmental Restoration Group, Inc.
8809 Washington NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

GRANTS (F)
RADON FLUX SURVEY LTP

RECEIVED NOV 0 9 2004

November 5, 2004

Mr. Alan D. Cox
Barrick Management Corporation
Homestake Mining Company
P.O. Box 98
Grants, NM 87020

Dear Mr. Cox:

Enclosed is a report of four flux measurements made on the top of the Large Tailings Pile on November 3-4, 2004. These four measurements were made in the flux measurement locations 30, 31, 32, and 33 on top of the pile to measure the effectiveness of recent remedial measures taken to reduce the flux in that area. The results are given below and are compared to the measurements made in August 2004.

	Flux (pCi/m^2s)	
Location	November 3-4, 2004	August 11-12, 2004
30	82.29	69.77
31	24.28	156.25
32	105.35	170.60
33	123.60	163.69

Substituting these new numbers for the August 11-12 numbers in the August flux report, this brings the average flux for the top of the large tailings pile down to 48.41 pCi/m^2s. The area-weighted-average flux for the Large Tailings Pile is then calculated to be 19.1 pCi/m^2s.

I hope this information is helpful.

Sincerely,

Kenneth R. Baker

Kenneth R. Baker Ph. D.
Principal

Radon Flux Measurements for HMC Grants Site

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

*Background counts/1200 sec

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
23	11/4/2004	18:23	11/3/2004	13:25	11/04/04	13:45	87600	1200	260520	2770	1.20E-02	4.83E+05	123.60	0.25	0.1	OK
41	11/4/2004	18:45	11/3/2004	13:25	11/04/04	13:45	87600	1200	2749	2770	1.20E-02	-3.94E+01	-0.01	0.04	0.1	OK
262	11/4/2004	19:20	11/3/2004	13:16	11/04/04	13:47	88260	1200	53397	2770	1.20E-02	9.49E+04	24.28	0.11	0.1	OK
260A	11/4/2004	19:50	11/3/2004	13:21	11/04/04	13:49	88080	1200	170947	2770	1.20E-02	3.15E+05	81.09	0.20	0.1	OK
79	11/4/2004	20:23	11/3/2004	13:28	11/04/04	13:39	87060	1200	217798	2770	1.20E-02	4.03E+05	105.35	0.23	0.1	OK
260B	11/4/2004	20:50	11/3/2004	13:21	11/04/04	13:49	88080	1200	174650	2770	1.20E-02	3.22E+05	83.50	0.20	0.1	OK

Reviewed by _____

Radon Flux Measurements for the HMC Tailings Piles

November 2003

Prepared for:

Homestake Mining Company of California
P. O. Box 98
Grants, New Mexico 87020

Prepared by:

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Radon Flux Measurements for the HMC Tailings Piles

1. Introduction

Reclamation activities associated with The Large Tailings Pile (LTP) at the Grants Uranium Mill, owned by Homestake Mining Company of California (HMC), were completed in phases. The pile was recontoured in 1994 at which time an interim cover was placed on the top of the pile to control the dispersal of tailings by wind and water erosion. Radon barrier was applied to the north, west, and south side slopes, with completion of the work in 1994. Radon flux measurements were made on these side slopes on October 24-25, 1994. Completion of the placement of radon barrier on the east side slope and aprons occurred just prior to making the radon flux measurements on July 24-25, 1995. Radon flux measurements were made on the top of the LTP and the Small Tailings Pile (STP) on August 18-19, 1995.

As part of a request for extension of the milestones in the NRC License, radon flux measurements were repeated in the areas with interim cover on October 21-22, 2003. This report presents the data for these measurements.

2. Radon Flux Results

The results of the flux measurements on the LTP and STP are presented in Table 2-1 and Table 2-2, respectively. Ninety-eight canister locations (waypoint numbers) were established on the piles as shown in Figure 2-1. Waypoints 15 and 16 as well as 19 and 20 are considered duplicates, with the canisters placed adjacent to one another. Canister No. 65 placed at Waypoint No. 88 was not retrieved and therefore no data are available for that canister. A total of 97 flux readings were made on the piles.

The distribution of canisters was allocated so that each canister represented an equal area of the total pile surface. Measurements are reported for 52 locations on the LTP and 46 locations on the STP. The average measured flux was 34.6 pCi/m^2s and 18.4 pCi/m^2s for the LTP and STP, respectively.

Field and laboratory data sheets are attached.

3. Average Pile Flux

The average flux for each pile should be limited to 100 pCi/m^2s. An evaporation pond is placed on the STP and therefore that portion of the pile has 0 pCi/m^2s flux. The flux values for the waypoints corresponding to the other portions of the pile (Side Slopes and Southern Portion) were averaged

and the corresponding areas were used to obtain an area weighted average flux of 5.58 pCi/m^{2}s. The areas for the side slopes, Southern Portion, and Evaporation Pond is 137,000 , 874,000 , and 874 square feet, respectively. The corresponding average flux for these areas was 40.53, 8.61, and 0 pCi/m^{2}s, respectively.

Since all but the top of the LTP has rock cover, canisters were placed on the top of the pile. The average measured flux was 34.6 pCi/m^{2}s. This compares to 42.1 pCi/m^{2}s measured in 1995. In the earlier data, the average flux on the sides of the pile was 3.27 pCi/m^{2}s, which constitutes 65 percent of the area. If one assumes that the flux on the side slopes remains constant, the average flux for the pile now is 14.1 pCi/m^{2}s. This compares favorably to the 17 pCi/m^{2}s measured in 1994-1995.

The data show that both piles meet the 20 pCi/m^{2}s standard in 10 CFR 40 Appendix A.

4. Quality Assurance

The EPA Method 115 requirements were met for the measurements. No rainfall was reported during the 24 hours prior to the measurements. Also the temperature exceeded 35 degrees F.

The attachment includes data where every 10th canister was reanalyzed. Agreement between measurements was within the statistical errors and consistent with state-of-the art gamma spectroscopy results.

Two independent sources were used to calibrate the spectrometer, using identical geometry conditions to that of the canisters. Good agreement between calibration factors was obtained. The results of these measurements are included in the attachment.

Two trip blanks (Canister Nos. 55 and 202) were included in the batch and counted with the canisters. The measured fluxes of -0.04 and 0.09 pCi/m^{2}s are near the expected 0.00 pCi/m^{2}s value. These results indicate that the canisters had not been exposed, confirming the integrity of the bags.

Two sets of duplicates were placed. Canisters 201 and 250 were placed at Waypoint Nos. 15 and 16. The radon flux results for these two canisters are 51.46 and 45.38 pCi/m^{2}s, respectively. Duplicate canisters 33 and 58 were placed at Waypoint Nos. 19 and 20, respectively. The radon flux results for these two canisters are 4.56 and 5.32 pCi/m^{2}s, respectively. The agreement is better than expected since the canisters were only placed near one another, and weren't true duplicates.

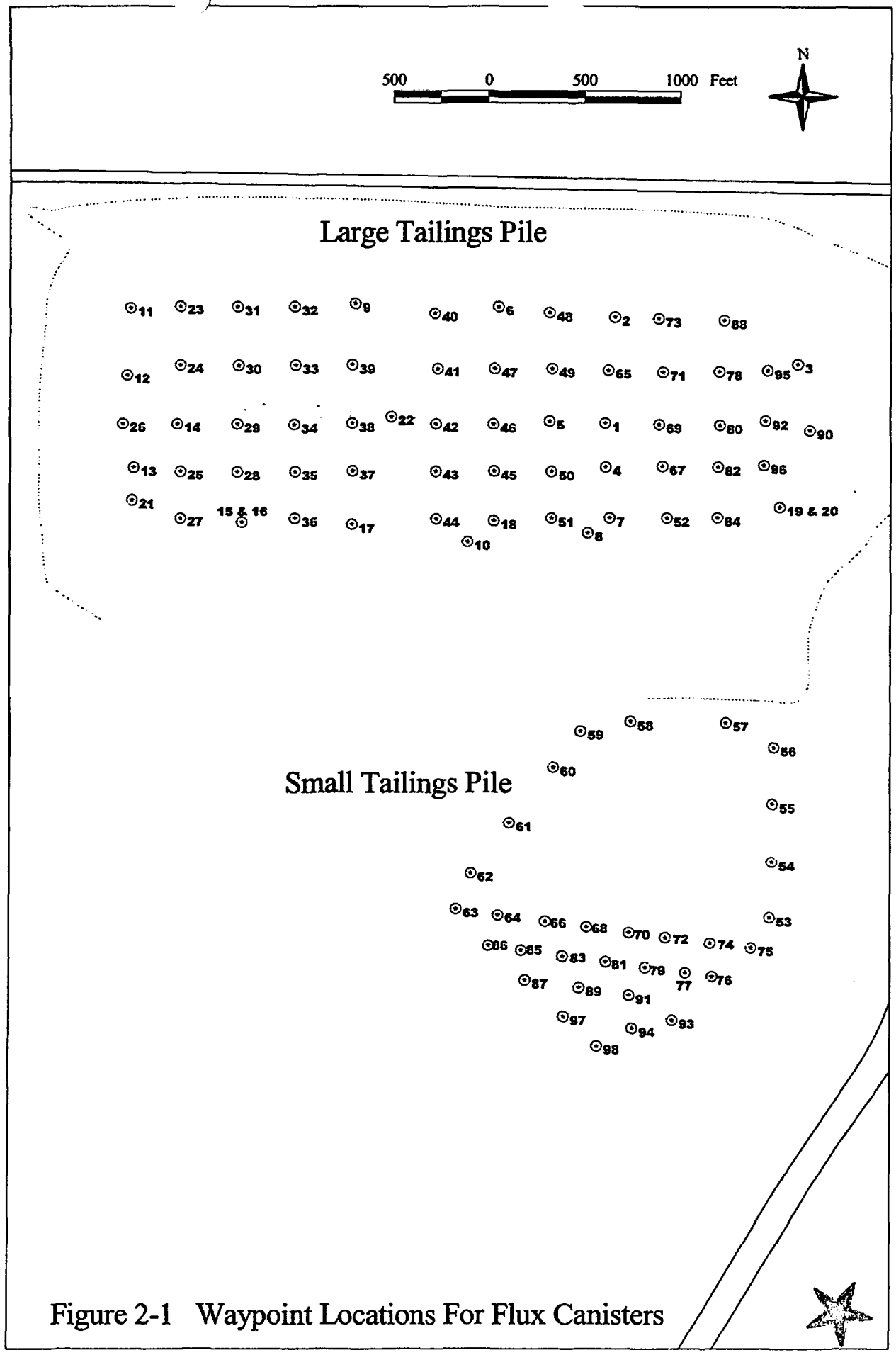

Figure 2-1 Waypoint Locations For Flux Canisters

Table 2-1 Large Tailings Pile Flux Measurements (pCi/m^2s)

Location	Canister No.	Flux	Error		Location	Canister No.	Flux	Error
1	20	11.16	0.86		35	6	148.99	3.35
2	88	49.6	1.68		36	69	14.93	0.83
3	38	2.75	0.23		37	54	147.26	7.36
4	1	71.58	2.93		38	42	4.36	0.3
5	66	10.01	0.52		39	260	2.83	0.25
6	72	14.86	0.67		40	59	24.92	1.03
7	64	13.5	0.9		41	82	33.08	1.78
8	63	34.66	1.37		42	78	14.88	1.01
9	79	108.1	3.55		43	87	143.28	7.61
10	254	10.63	0.35		44	8	45.1	1.37
11	7	12.75	0.51		45	262	15.73	0.83
12	104	17.92	0.74		46	259	1.74	0.2
13	98	1.74	0.26		47	106	8.28	0.42
14	81	20.96	1.23		48	19	33.2	1.54
15	250	51.46	2.15		49	61	111.57	5.67
17	46	54.32	1.86		50	103	32.24	1.14
18	94	41.04	1.66		51	35	15.29	0.5
20	58	5.32	0.32		52	73	39.38	0.79
21	49	1.07	0.21		65	99	1.44	0.22
22	255	70.57	1.04		67	263	1.77	0.25
23	50	124.54	2.64		69	100	1.9	0.27
24	11	76.22	1.46		71	28	1.34	0.2
25	60	83.53	4.17		73	39	20.54	1.02
26	30	12.41	0.74		78	110	25.33	1
27	53	6.67	0.44		80	44	36.27	1.95
28	47	3.32	0.26		82	102	1.13	0.21
29	41	1.32	0.22		84	84	29.41	1.62
30	258	48.61	2.05		90	29	0.79	0.25
31	9	133.6	3.68		92	67	19.72	0.4
32	52	46.4	1.48		95	101	2.29	0.24
33	252	21.48	1.13		96	90	33.14	1.11
34	76	1.6	0.26		Average		34.54	

Table 2-2 Small Tailings Pile Flux Measurements (pCi/m^2s)

Location	Canister No.	Flux	Error
53	40	21.26	0.48
54	22	90.93	3.31
55	16	78.55	2.85
56	93	3.29	0.29
57	261	7.71	0.47
58	45	9.44	0.52
59	85	42.51	1.40
60	86	22.24	0.75
61	2	36.23	1.13
62	91	93.17	3.01
63	251	4.81	0.41
64	34	4.71	0.30
66	257	10.33	0.74
68	109	13.87	0.85
70	13	16.42	0.81
72	80	1.38	0.26
74	203	9.57	0.46
75	27	23.83	0.79
76	75	3.65	0.27
77	57	12.90	0.88
79	92	8.99	0.49
81	62	8.95	0.51
83	70	8.03	0.61
85	256	0.00	0.36
86	43	3.17	0.25
87	4	11.78	0.78
89	51	4.50	0.33
91	25	3.35	0.27
93	37	21.19	0.92
94	17	5.56	0.36
97	56	3.78	0.30
98	36	3.83	0.27
	Average	18.44	

ATTACHMENT

To

Radon Flux Measurements for the HMC Tailings Piles

Repeat Analysis of Flux Canisters (pCi/m^2s)

Canister No.	Average Flux	First Count	Second Count
102	1.01	1.13	0.88
8	44.34	45.1	43.57
262	15.79	15.73	15.85
42	4.25	4.36	4.13
260	3.02	2.83	3.21
9	131.84	133.62	130.05
252	23.70	21.48	25.91
104	17.61	17.92	17.29
256	4.78	4.73	4.83

Determining Detector Counting Efficiency for EG&G System

Date	Count Time (s)	Standard (nCi)	Counts	Error	Bkg Counts	Bkg % error	Efficiency	Error (1 St Dev)
10/21/03	1200	78.83	26739	488.00	-628.0	203.0	0.00782	0.00015
10/21/03	1200	80.00	30453	537.00	-628.0	203.0	0.00875	0.00016

Determining Detector Counting Efficiency for Canberra System

Date	Count Time (s)	Standard (nCi)	Counts	Error	Bkg Counts	Bkg % error	Efficiency	Error (1 St Dev)
10/21/03	1200	80	30177	1.83	239	83.6	0.00843	0.00008
10/21/03	1200	78.83	24825	2.15	239	83.6	0.00702	0.00008

Radon Flux Measurements

Site: Homestake Mining Company

EG&G System

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Collection Time (sec)	Count Time (sec	Peak Counts	Error	Bkg counts	Error	Detector Efficiency	Canister Activity(nCi)	Flux pCi/m2s	Flux Erro 1.00 S.D.	LLD pCi/m2
34	10/22/03	20:45	10/20	16:14	10/21	17:07	89580	1200	5179	281.0	-628.0	243.0	8.28E-03	1.89E+04	4.71	0.30	0.92
109	10/22/03	21:15	10/20	15:57	10/21	17:27	91800	346	4417	191.0	-628.0	243.0	8.28E-03	1.65E+04	13.87	0.85	3.11
56	10/22/03	21:26	10/20	15:43	10/21	16:57	90840	1200	4071	288.0	-628.0	243.0	8.28E-03	1.53E+04	3.78	0.30	0.91
4	10/22/03	21:53	10/20	13:39	10/21	17:03	98640	375	4290	215.0	-628.0	243.0	8.28E-03	1.60E+04	11.78	0.78	2.71
27	10/22/03	22:02	10/20	16:18	10/21	16:37	85260	502	11266	309.0	-628.0	243.0	8.28E-03	3.88E+04	23.83	0.79	2.27
57	10/22/03	22:19	10/20	15:23	10/21	16:41	91080	358	4124	217.0	-628.0	243.0	8.28E-03	1.55E+04	12.90	0.88	3.07
37	10/22/03	03:39	10/20	15:17	10/21	16:54	92220	315	7386	248.0	-628.0	243.0	8.28E-03	2.61E+04	21.19	0.92	2.99
13	10/22/03	03:46	10/20	15:54	10/21	16:45	89460	346	5993	216.0	-628.0	243.0	8.28E-03	2.16E+04	16.42	0.81	2.81
25	10/22/03	03:54	10/20	15:29	10/21	16:41	90720	1200	4102	286.0	-628.0	243.0	8.28E-03	1.54E+04	3.35	0.27	0.80
260	10/22/03	04:17	10/20	13:04	10/21	16:05	97260	1200	3597	281.0	-628.0	243.0	8.28E-03	1.38E+04	2.83	0.25	0.76
260B	10/22/03	04:41	10/20	13:04	10/21	16:05	97260	1200	4152	266.0	-628.0	243.0	8.28E-03	1.56E+04	3.21	0.24	0.76
40	10/22/03	05:03	10/20	16:19	10/21	16:36	87420	954	22254	458.0	-628.0	243.0	8.28E-03	7.46E+04	21.26	0.48	1.05
59	10/22/03	05:45	10/20	14:03	10/21	15:48	92700	309	9446	300.0	380.0	225.0	8.28E-03	2.96E+04	24.92	1.03	2.88
29	10/22/03	05:51	10/20	14:15	10/21	15:19	90240	1200	1457	255.0	380.0	225.0	8.28E-03	3.51E+03	0.79	0.25	0.76
33	10/22/03	06:17	10/20	14:24	10/21	15:18	89640	1200	6573	318.0	380.0	225.0	8.28E-03	2.02E+04	4.56	0.29	0.77
101	10/22/03	06:46	10/20	11:02	10/21	15:32	102600	1200	3892	295.0	380.0	225.0	8.28E-03	1.15E+04	2.29	0.24	0.68
69	10/22/03	07:17	10/20	14:45	10/21	14:59	87240	362	6297	238.0	380.0	225.0	8.28E-03	1.93E+04	14.93	0.83	2.65
254	10/22/03	07:25	10/20	14:43	10/21	15:06	87780	1200	14400	402.0	380.0	225.0	8.28E-03	4.57E+04	10.63	0.35	0.79
81	10/22/03	08:05	10/20	13:32	10/21	14:46	90840	228	5767	222.0	380.0	225.0	8.28E-03	1.76E+04	20.96	1.23	4.08
252	10/22/03	08:11	10/20	13:09	10/21	14:35	91560	258	6658	241.0	380.0	225.0	8.28E-03	2.05E+04	21.48	1.13	3.59

KRS

Radon Flux Measurements

Site: Homestake Mining Company

EG&G System

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Collection Time (sec	Count Time (sec	Peak Counts	Error	Bkg counts	Error	Detector Efficiency	Canister Activity(nCi)	Flux pCi/m2s	Flux Erro 1.00 S.D.	LLD pCi/m2
252B	10/22/03	08:15	10/20	13:09	10/21	14:35	91560	135	4340	192.0	380.0	225.0	8.28E-03	1.29E+04	25.91	1.94	6.86
11	10/22/03	08:21	10/20	13:29	10/21	14:47	91080	287	25044	416.0	380.0	225.0	8.28E-03	8.05E+04	76.22	1.46	3.24
258	10/22/03	08:29	10/20	13:25	10/21	14:37	90720	147	8390	253.0	380.0	225.0	8.28E-03	2.61E+04	48.61	2.05	6.36
53.0	10/22/03	08:34	10/20	14:36	10/21	14:55	87540	716	5567	255.0	380.0	225.0	8.28E-03	1.69E+04	6.67	0.44	1.35
98	10/22/03	08:48	10/20	13:41	10/21	14:52	90660	1200	2710	260.0	380.0	225.0	8.28E-03	7.60E+03	1.74	0.26	0.78
64	10/22/03	09:21	10/20	11:55	10/21	14:12	94620	298	5020	213.0	380.0	225.0	8.28E-03	1.51E+04	13.50	0.90	3.05
76	10/22/03	10:04	10/20	13:11	10/21	14:33	91320	1200	2516	265.0	380.0	225.0	8.28E-03	6.97E+03	1.60	0.26	0.79
255	10/22/03	10:31	10/20	13:00	10/21	14:26	91560	496	39279	530.0	380.0	225.0	8.28E-03	1.27E+05	70.57	1.04	1.90
54	10/22/03	10:41	10/20	12:58	10/21	14:29	91860	41	7107	250.0	380.0	225.0	8.28E-03	2.19E+04	147.26	7.36	22.95
82	10/22/03	10:43	10/20	12:40	10/21	14:23	92580	152	6016	203.0	380.0	225.0	8.28E-03	1.84E+04	33.08	1.78	6.15
42	10/22/03	10:47	10/20	12:55	10/21	14:28	91980	1080	5624	283.0	380.0	225.0	8.28E-03	1.71E+04	4.36	0.30	0.87
42B	10/22/03	11:07	10/20	12:55	10/21	14:28	91980	1014	5028	286.0	380.0	225.0	8.28E-03	1.52E+04	4.13	0.32	0.93
6	10/22/03	11:26	10/20	13:13	10/21	14:31	91080	117	19547	367.0	380.0	225.0	8.28E-03	6.25E+04	148.99	3.35	8.15
78	10/22/03	11:30	10/20	12:42	10/21	14:20	92280	287	5122	228.0	380.0	225.0	8.28E-03	1.55E+04	14.88	1.01	3.29
100	10/22/03	11:44	10/20	11:45	10/21	13:58	94380	1200	2952	282.0	380.0	225.0	8.28E-03	8.39E+03	1.90	0.27	0.78
44	10/22/03	12:07	10/20	11:22	10/21	13:52	95400	149	6514	241.0	380.0	225.0	8.28E-03	2.00E+04	36.27	1.95	6.20
263	10/22/03	12:19	10/20	11:49	10/21	13:56	94020	1200	2760	257.0	380.0	225.0	8.28E-03	7.76E+03	1.77	0.25	0.78
1	10/22/03	12:41	10/20	11:58	10/21	14:05	94020	105	8778	260.0	380.0	225.0	8.28E-03	2.74E+04	71.58	2.93	8.94
61	10/22/03	12:44	10/20	12:10	10/21	14:11	93660	52	6843	239.0	380.0	225.0	8.28E-03	2.11E+04	111.57	5.67	18.10
20	10/22/03	12:53	10/20	12:03	10/21	14:04	93660	330	4474	223.0	380.0	225.0	8.28E-03	1.34E+04	11.16	0.86	2.86

KRB

Radon Flux Measurements

Site: Homestake Mining Company

EG&G System

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Collection Time (sec)	Count Time (sec	Peak Counts	Error	Bkg counts	Error	Detector Efficiency	Canister Activity(nCi)	Flux pCi/m2s	Flux Erro 1.00 S.D.	LLD pCi/m2
87	10/22/03	12:56	10/20	12:45	10/21	14:18	91980	37	6186	211.0	380.0	225.0	8.28E-03	1.89E+04	143.28	7.61	25.87
262	10/22/03	12:56	10/20	12:27	10/21	14:17	93000	367	6764	248.0	380.0	225.0	8.28E-03	2.08E+04	15.73	0.83	2.58
262B	10/22/03	13:02	10/20	12:27	10/21	14:17	93000	321	6003	227.0	380.0	225.0	8.28E-03	1.83E+04	15.85	0.90	2.96
251	10/22/03	13:09	10/20	16:33	10/21	17:06	88380	739	4208	241.0	380.0	225.0	8.28E-03	1.25E+04	4.81	0.41	1.32
70	10/22/03	13:23	10/20	16:02	10/21	17:15	90780	489	4710	241.0	380.0	225.0	8.28E-03	1.41E+04	8.03	0.61	1.95
80	10/22/03	13:33	10/20	15:52	10/21	17:32	92400	1200	2239	260.0	380.0	225.0	8.28E-03	6.06E+03	1.38	0.26	0.78
62.0	10/22/03	14:00	10/20	15:33	10/21	17:21	92880	641	6813	290.0	380.0	225.0	8.28E-03	2.10E+04	8.95	0.51	1.46
257	10/22/03	14:12	10/20	15:59	10/21	17:06	90420	388	4749	220.0	380.0	225.0	8.28E-03	1.43E+04	10.33	0.74	2.48

Radon Flux Measurements

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Cannberra System

*Background counts/1200 sec

Site:Homestake Mining Company

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Collection Time (sec)	Count Time (sec)	Peak Counts	Percent Error	Bkg* counts	Percent Error	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
45	10/21/03	21:10	10/20/2003	16:26	10/21/03	17:45	91140	430	4993	5	239	83.6	7.73E-03	3.87E+04	9.44	0.52	0.7
43	10/21/03	21:20	10/20/2003	16:15	10/21/03	17:04	89340	1200	4581	6.1	239	83.6	7.73E-03	1.27E+04	3.17	0.25	0.7
36	10/21/03	21:47	10/20/2003	15:04	10/21/03	16:59	93300	948	4533	5.6	239	83.6	7.73E-03	1.58E+04	3.83	0.27	0.7
203	10/21/03	22:07	10/20/2003	16:07	10/21/03	16:38	88260	561	6249	4.4	239	83.6	7.73E-03	3.75E+04	9.57	0.46	0.7
22	10/21/03	22:19	10/20/2003	16:21	10/21/03	16:34	87180	63	6569	3.5	239	83.6	7.73E-03	3.51E+05	90.93	3.31	0.7
75	10/21/03	22:22	10/20/2003	15:21	10/21/03	16:40	91140	1023	4536	5.9	239	83.6	7.73E-03	1.47E+04	3.65	0.27	0.7
92	10/22/03	03:39	10/20/2003	15:27	10/21/03	16:43	90960	587	6064	5	239	83.6	7.73E-03	3.47E+04	8.99	0.49	0.7
85	10/22/03	03:51	10/20/2003	16:28	10/21/03	17:52	91440	187	9124	3.2	239	83.6	7.73E-03	1.66E+05	42.51	1.40	0.7
7	10/22/03	03:56	10/20/2003	13:54	10/21/03	16:02	94080	479	7139	3.7	239	83.6	7.73E-03	5.04E+04	12.75	0.51	0.7
104	10/22/03	04:07	10/20/2003	13:47	10/21/03	16:05	94680	326	6871	3.9	239	83.6	7.73E-03	7.12E+04	17.92	0.74	0.7
52	10/22/03	04:14	10/20/2003	13:59	10/21/03	15:49	93000	200	10578	3.1	239	83.6	7.73E-03	1.81E+05	46.40	1.48	0.7
16	10/22/03	04:19	10/20/2003	16:22	10/21/03	16:31	86940	85	7272	3.5	239	83.6	7.73E-03	2.89E+05	78.57	2.85	0.7
99	10/22/03	04:22	10/20/2003	12:06	10/21/03	16:14	101280	1200	2321	11	239	83.6	7.73E-03	6.07E+03	1.44	0.22	0.6
104B	10/22/03	04:44	10/20/2003	13:47	10/21/03	16:05	94680	339	6865	4.1	239	83.6	7.73E-03	6.84E+04	17.29	0.75	0.7
93	10/22/03	04:51	10/20/2003	16:24	10/21/03	16:30	86760	1200	4367	6.9	239	83.6	7.73E-03	1.20E+04	3.29	0.29	0.7
88	10/22/03	05:18	10/20/2003	14:07	10/21/03	15:43	92160	187	10398	3.3	239	83.6	7.73E-03	1.90E+05	49.60	1.68	0.7
39	10/22/03	05:22	10/20/2003	11:36	10/21/03	15:40	101040	197	5051	4.7	239	83.6	7.73E-03	8.54E+04	20.54	1.02	0.7
79	10/22/03	05:28	10/20/2003	14:01	10/21/03	15:52	93060	82	10031	3.2	239	83.6	7.73E-03	4.18E+05	108.06	3.55	0.7
19	10/22/03	05:31	10/20/2003	14:50	10/21/03	15:45	89700	136	5058	4.4	239	83.6	7.73E-03	1.24E+05	33.20	1.54	0.7
9	10/22/03	05:35	10/20/2003	13:57	10/21/03	15:57	93600	87	13149	2.7	239	83.6	7.73E-03	5.19E+05	133.62	3.68	0.7

Reviewed by _____

Radon Flux Measurements

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Cannberra System

*Background counts/1200 sec

Site:Homestake Mining Company

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Collection Time (sec)	Count Time (sec)	Peak Counts	Percent Error	Bkg* counts	Percent Error	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
9B	10/22/03	05:37	10/20/2003	13:57	10/21/03	15:57	93600	92	13523	2.8	239	83.6	7.73E-03	5.05E+05	130.05	3.71	0.7
72	10/22/03	05:41	10/20/2003	12:33	10/21/03	15:46	97980	336	6005	4.2	239	83.6	7.73E-03	6.00E+04	14.86	0.67	0.7
50	10/22/03	05:46	10/20/2003	13:55	10/21/03	16:00	93900	190	26565	2.1	239	83.6	7.73E-03	4.85E+05	124.54	2.64	0.7
58	10/22/03	05:54	10/20/2003	14:24	10/21/03	15:18	89640	1134	6630	5.0	239	83.6	7.73E-03	1.97E+04	5.32	0.32	0.7
90	10/22/03	06:14	10/20/2003	11:11	10/21/03	15:24	101580	217	8610	3.3	92	83.6	7.73E-03	1.37E+05	33.14	1.11	0.3
110	10/22/03	06:19	10/20/2003	11:29	10/21/03	15:35	101160	230	6972	3.9	92	83.6	7.73E-03	1.05E+05	25.33	1.00	0.3
67	10/22/03	06:25	10/20/2003	11:05	10/21/03	15:26	102060	1200	28181	2.0	92	83.6	7.73E-03	8.19E+04	19.72	0.40	0.3
38	10/22/03	06:47	10/20/2003	14:13	10/21/03	15:29	90960	1200	3614	7.8	92	83.6	7.73E-03	1.03E+04	2.75	0.23	0.3
201	10/22/03	07:15	10/20/2003	14:39	10/21/03	14:57	87480	162	7617	3.7	92	83.6	7.73E-03	1.62E+05	45.38	1.70	0.3
250	10/22/03	07:17	10/20/2003	14:39	10/21/03	14:57	87480	101	5411	4.1	92	83.6	7.73E-03	1.84E+05	51.46	2.15	0.3
46	10/22/03	07:22	10/20/2003	14:42	10/21/03	15:01	87540	184	10324	3.4	92	83.6	7.73E-03	1.95E+05	54.32	1.86	0.3
94	10/22/03	07:27	10/20/2003	12:21	10/21/03	15:04	96180	180	8326	4.0	92	83.6	7.73E-03	1.60E+05	41.04	1.66	0.3
35	10/22/03	07:31	10/20/2003	12:18	10/21/03	15:08	96600	660	11377	3.2	92	83.6	7.73E-03	5.98E+04	15.29	0.50	0.3
8	10/22/03	08:01	10/20/2003	12:47	10/21/03	15:03	94560	220	10935	3.0	92	83.6	7.73E-03	1.72E+05	45.10	1.37	0.3
8B	10/22/03	08:08	10/20/2003	12:47	10/21/03	15:03	94560	820	39079	1.7	92	83.6	7.73E-03	1.66E+05	43.57	0.74	0.3
49	10/22/03	08:33	10/20/2003	14:37	10/21/03	14:53	87360	1200	1394	17.4	92	83.6	7.73E-03	3.80E+03	1.07	0.21	0.3
30	10/22/03	08:56	10/20/2003	13:43	10/21/03	14:51	90480	305	4033	5.8	92	83.6	7.73E-03	4.52E+04	12.41	0.74	0.3
84	10/22/03	09:10	10/20/2003	11:14	10/21/03	15:16	100920	121	4187	5.4	92	83.6	7.73E-03	1.18E+05	29.41	1.62	0.3
73	10/22/03	09:18	10/20/2003	11:52	10/21/03	15:14	98520	727	32273	2.0	92	83.6	7.73E-03	1.55E+05	39.38	0.79	0.3
63	10/22/03	09:33	10/20/2003	14:30	10/21/03	14:10	85200	221	7569	3.9	92	83.6	7.73E-03	1.18E+05	34.66	1.37	0.3

Reviewed by KRB

Radon Flux Measurements

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Cannberra System

*Background counts/1200 sec

Site:Homestake Mining Company

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Collection Time (sec)	Count Time (sec)	Peak Counts	Percent Error	Bkg* counts	Percent Error	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
60	10/22/03	09:57	10/20/2003	13:36	10/21/03	14:43	90420	59	5177	4.9	92	83.6	7.73E-03	3.01E+05	83.53	4.17	0.3
41	10/22/03	10:02	10/20/2003	13:22	10/21/03	14:40	91080	1200	1738	15.0	92	83.6	7.73E-03	4.80E+03	1.32	0.22	0.3
47	10/22/03	10:27	10/20/2003	13:16	10/21/03	14:41	91500	1200	4229	7.3	92	83.6	7.73E-03	1.21E+04	3.32	0.26	0.3
106	10/22/03	10:56	10/20/2003	12:31	10/21/03	14:13	92520	645	5653	4.9	92	83.6	7.73E-03	3.02E+04	8.28	0.42	0.3
259	10/22/03	11:09	10/20/2003	12:28	10/21/03	14:15	92820	1200	2265	10.6	92	83.6	7.73E-03	6.33E+03	1.74	0.20	0.3
102	10/22/03	11:34	10/20/2003	11:17	10/21/03	13:54	95820	1200	1541	16.3	92	83.6	7.73E-03	4.22E+03	1.13	0.21	0.3
102B	10/22/03	11:57	10/20/2003	11:17	10/21/03	13:54	95820	1200	1213	21.3	92	83.6	7.73E-03	3.27E+03	0.88	0.21	0.3
66	10/22/03	12:19	10/20/2003	12:15	10/21/03	14:08	93180	428	4532	5.1	92	83.6	7.73E-03	3.63E+04	10.01	0.52	0.3
103	10/22/03	12:28	10/20/2003	12:17	10/21/03	14:07	93000	305	10254	3.5	92	83.6	7.73E-03	1.17E+05	32.24	1.14	0.3
28	10/22/03	12:35	10/20/2003	11:42	10/21/03	14:01	94740	1200	1780	13.6	92	83.6	7.73E-03	4.92E+03	1.34	0.20	0.3
17	10/22/03	13:01	10/20/2003	15:10	10/21/03	16:51	92460	700	4158	6.3	92	83.6	7.73E-03	2.03E+04	5.56	0.36	0.3
2	10/22/03	13:14	10/20/2003	16:31	10/21/03	17:47	90960	359	13560	3.1	92	83.6	7.73E-03	1.31E+05	36.23	1.13	0.3
91	10/22/03	13:21	10/20/2003	16:32	10/21/03	17:08	88560	137	12919	3.2	92	194	7.73E-03	3.28E+05	93.17	3.01	0.7
86	10/22/03	13:25	10/20/2003	16:30	10/21/03	17:50	91200	498	11573	3.3	92	194	7.73E-03	8.06E+04	22.24	0.75	0.7
261	10/22/03	13:35	10/20/2003	16:25	10/21/03	17:39	90840	630	5098	5.7	92	194	7.73E-03	2.78E+04	7.71	0.47	0.7
51	10/22/03	13:47	10/20/2003	13:35	10/21/03	17:18	99780	895	4589	6.6	92	194	7.73E-03	1.76E+04	4.50	0.33	0.6
256	10/22/03	14:03	10/20/2003	16:16	10/21/03	17:14	89880	861	4220	6.9	92	194	7.73E-03	1.68E+04	4.73	0.36	0.7
256B	10/22/03	14:20	10/20/2003	16:16	10/21/03	17:14	89880	1200	5944	5.8	92	194	7.73E-03	1.71E+04	4.83	0.32	0.7
55	10/22/03	17:00	10/20/2003	16:16	10/21/03	17:14	89880	1200	40	456.0	92	194	7.73E-03	-1.52E+02	-0.04	0.21	0.7
202	10/24/03	16:20	10/22/2003	18:16	10/23/03	19:14	89880	1200	202	5.8	92	194	7.73E-03	3.21E+02	0.09	0.15	0.7

Reviewed by KRB

ID	Easting	Northing	Point Number	ERG Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Initials	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Initials
"AB-9"	491868	1543890	1	20	10/20/03	1203	[illegible]			
"AA-9"	491896	1544718	2	88	10/20/03	14:07				
"X-1"	492187	1544723	3	38		1413				
"AB-8"	491867	1543657	4	1		1158				
"AA-8"	491589	1544710	5	66		1215				
"AB-7"	491284	1544704	6	72		1233				
"AA-7"	491890	1543385	7	64		1155				
"AA-6"	490995	1544737	8	63		1430				
"AA-5"	490544	1544734	9	79		14:01				
"AA-4"	490243	1544757	10	254		1433				
"BB"	489132	1544202	11	7		13:54				
"CC"	489135	1543898	12	104		1347				
"DD"	489137	1543643	13	98		1341				
"F-2"	489640	1543129	14	81		1332				
"F-3"	489941	1543110	15	250		1439				
"F-4"	490239	1543125	16	201		1439				
"F-5"	490541	1543131	17	46		1442				
"F-7"	491286	1543128	18	94		1221				
"F-8"	491586	1543135	19	33		1424				
"F-9"	491892	1543150	20	53	SRKA	1424				
"FLY"	489297	1543520	21	49		14:37				
"TOWER"	490749	1543923	22	255		1300				
"A-2"	489643	1544505	23	50		1355				
"B-2"	489642	1544195	24	11		1329				
"D-2"	489641	1543632	25	60		1336				
"C-1"	489342	1543885	26	30		1342				
"E-2"	489643	1543382	27	[illegible]		1436				
"D-3"	489939	1543628	28	47		1316				
"C-3"	489943	1543882	29	41		[illegible]				1322
"B-3"	489947	1544192	30	258		1325				
"A-3"	489942	1544501	31	9		1357				
"A-4"	490241	1544503	32	52		1359				
"B-4"	490246	1544195	33	252		1309				
"C-4"	490240	1543881	34	76		1311				
"D-4"	490242	1543632	35	6		1313				
"E-4"	490243	1543382	36	109		1445				
"D-5"	490542	1543635	37	54		1258				
"C-5"	490543	1543887	38	42		1255				
"B-5"	490542	1544195	39	260		1304				
"A-6"	490976	1544470	40	59		1403				
"B-6"	490992	1544178	41	82		1240				
"C-6"	490985	1543886	42	78		1242				
"D-6"	490982	1543634	43	87		1245				
"E-6"	490985	1543380	44	8		1247				
"D-7"	491287	1543634	45	262		1227				
"C-7"	491286	1543884	46	259		1228				
"B-7"	491291	1544177	47	106		1231				
"A-8"	491576	1544473	48	19		1450				
"B-8"	491591	1544178	49	61		1210				
"D-8"	491586	1543633	50	103		1217				

DUPLICATE OF 15

DUPLICATE OF 19

ID	Easting	Northing	Point Number	ERG Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Initials	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Initials
"AB-9"	491868	1543890	1	20	10/20/03	1203	[illegible]			
"AA-9"	491896	1544718	2	88	10/20/03	14:07				
"X-1"	492187	1544723	3	38		1413				
"AB-8"	491867	1543657	4			1158				
"AA-8"	491589	1544710	5	66		1215				
"AB-7"	491284	1544704	6	72		1233				
"AA-7"	491890	1543385	7	64		1155				
"AA-6"	490995	1544737	8	63		1430				
"AA-5"	490544	1544734	9	79		14:01				
"AA-4"	490243	1544757	10	254		1433				
"BB"	489132	1544202	11	7		13:54				
"CC"	489135	1543898	12	104		1347				
"DD"	489137	1543643	13	98		1341				
"F-2"	489640	1543129	14	81		1332				
"F-3"	489941	1543110	15	250		1439				
"F-4"	490239	1543125	16	201		1439				
"F-5"	490541	1543131	17	46		1442				
"F-7"	491286	1543128	18	94		1221				
"F-8"	491586	1543135	19	33		1424				
"F-9"	491892	1543150	20	53	ST KA	1424				
"FLY"	489297	1543520	21	49		14:37				
"TOWER"	490749	1543923	22	255		1300				
"A-2"	489643	1544505	23	50		1355				
"B-2"	489642	1544195	24	11		1329				
"D-2"	489641	1543632	25	100		1336				
"C-1"	489342	1543885	26	30		1348				
"E-2"	489643	1543382	27	[illegible]		1436				
"D-3"	489939	1543628	28	47		1316				
"C-3"	489943	1543882	29	41		[illegible]				1322
"B-3"	489947	1544192	30	258		1325				
"A-3"	489942	1544501	31	9		1357				
"A-4"	490241	1544503	32	52		1359				
"B-4"	490246	1544195	33	252		1309				
"C-4"	490240	1543881	34	76		1311				
"D-4"	490242	1543632	35	6		1313				
"E-4"	490243	1543382	36	109		1445				
"D-5"	490542	1543635	37	54		1258				
"C-5"	490543	1543887	38	42		1255				
"B-5"	490542	1544195	39	260		1304				
"A-6"	490976	1544470	40	59		1403				
"B-6"	490992	1544178	41	82		1240				
"C-6"	490985	1543886	42	78		1242				
"D-6"	490982	1543634	43	87		1245				
"E-6"	490985	1543380	44	8		1247				
"D-7"	491287	1543634	45	262		1227				
"C-7"	491286	1543884	46	259		1228				
"B-7"	491291	1544177	47	106		1231				
"A-8"	491576	1544473	48	19		1450				
"B-8"	491591	1544178	49	61		1210				
"D-8"	491586	1543633	50	103		1217				

DUPLICATE OF 15

DUPLICATE OF 19

ID	Easting	Northing	Point Number	ERG Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Initials	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Initials
"AB-9"	491868	1543890	1	20	10/20/03	1203	[illegible]			
"AA-9"	491896	1544718	2	88	10/20/03	14:07				
"X-1"	492187	1544723	3	38		1413				
"AB-8"	491867	1543657	4			1158				
"AA-8"	491589	1544710	5	66		1215				
"AB-7"	491284	1544704	6	72		1233				
"AA-7"	491890	1543385	7	64		1155				
"AA-6"	490995	1544737	8	63		1430				
"AA-5"	490544	1544734	9	79		14:01				
"AA-4"	490243	1544757	10	254		1433				
"BB"	489132	1544202	11	7		13:54				
"CC"	489135	1543898	12	104		1347				
"DD"	489137	1543643	13	98		1341				
"F-2"	489640	1543129	14	81		1332				
"F-3"	489941	1543110	15	250		1439				
"F-4"	490239	1543125	16	201		1439				
"F-5"	490541	1543131	17	46		1442				
"F-7"	491286	1543128	18	94		1221				
"F-8"	491586	1543135	19	33		1424				
"F-9"	491892	1543150	20	53	58 KB	1424				
"FLY"	489297	1543520	21	49		14:37				
"TOWER"	490749	1543923	22	255		1300				
"A-2"	489643	1544505	23	50		1355				
"B-2"	489642	1544195	24	11		1329				
"D-2"	489641	1543632	25	60		1336				
"C-1"	489342	1543885	26	30		1348				
"E-2"	489643	1543382	27	53		1436				
"D-3"	489939	1543628	28	47		1316				
"C-3"	489943	1543882	29	41		[illegible]				
"B-3"	489947	1544192	30	258		1325				
"A-3"	489942	1544501	31	9		1357				
"A-4"	490241	1544503	32	52		1359				
"B-4"	490246	1544195	33	252		1309				
"C-4"	490240	1543881	34	76		1311				
"D-4"	490242	1543632	35	6		1313				
"E-4"	490243	1543382	36	109		1445				
"D-5"	490542	1543635	37	54		1258				
"C-5"	490543	1543887	38	42		1255				
"B-5"	490542	1544195	39	260		1304				
"A-6"	490976	1544470	40	59		1403				
"B-6"	490992	1544178	41	82		1240				
"C-6"	490985	1543886	42	78		1242				
"D-6"	490982	1543634	43	87		1245				
"E-6"	490985	1543380	44	8		1247				
"D-7"	491287	1543634	45	262		1227				
"C-7"	491286	1543884	46	259		1228				
"B-7"	491291	1544177	47	106		1231				
"A-8"	491576	1544473	48	19		1450				
"B-8"	491591	1544178	49	61		1210				
"D-8"	491586	1543633	50	103		1217				

DUPLICATE OF 15

DUPLICATE OF 19

1322

Radon Flux Measurements for the HMC Tailings Piles

August 2004

Prepared for:

Homestake Mining Company of California
P. O. Box 98
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Prepared by:

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Radon Flux Measurements for the HMC Tailings Piles

1. Introduction

Reclamation activities associated with The Large Tailings Pile (LTP) at the Grants Uranium Mill, owned by Homestake Mining Company of California (HMC), were completed in phases. The pile was contoured in 1994 at which time an interim cover was placed on the top of the pile to control the dispersal of tailings by wind and water erosion. Radon barrier was applied to the north, west, and south side slopes, with completion of the work in 1994. Radon flux measurements were made on these side slopes on October 24-25, 1994. Completion of the placement of radon barrier on the east side slope and aprons occurred just prior to making the radon flux measurements on July 24-25, 1995. An evaporation pond was constructed on the Small Tailings Pile (STP) and an interim cover placed on the remainder of the pile. Radon flux measurements were made on the top of the LTP and the interim cover of the Small Tailings Pile (STP) on August 18-19, 1995.

As part of a request for a license amendment extending the milestones in the NRC License, radon flux measurements were repeated in the areas with interim cover on October 21-22, 2003. This license amendment required HMC to repeat these measurements annually. This report presents the data for the Year 2004 flux measurements made on August 11-12, 2004.

2. Radon Flux Results

The results of the flux measurements on the LTP and STP are presented in Table 2-1 and Table 2-2, respectively. Ninety-eight canister locations (waypoint numbers) were established on the piles as shown in Figure 2-1. Waypoints 15 and 16 as well as 19 and 20 are considered duplicates, with the canisters placed adjacent to one another. A total of 99 flux readings were made on the piles.

The distribution of canisters was allocated so that each canister represented an equal area of the total pile surface. Measurements are reported for 66 locations on the LTP and 33 locations on the STP. The average measured flux was 51.8 pCi/m^2s and 22.0 pCi/m^2s for the LTP and STP, respectively.

Field and laboratory data sheets are attached.

3. Average Pile Flux

The average flux for each pile should be limited to 100 pCi/m^2s. An evaporation pond is placed on the STP and therefore that portion of the pile has 0 pCi/m^2s flux. The flux values for the waypoints corresponding to the other portions of the pile (Side Slopes and Southern Portion) were averaged and the corresponding areas were used to obtain an area weighted average flux of 7.7 pCi/m^2s. The areas for the side slopes, Southern Portion, and Evaporation Pond is 137,000 , 874,000 , and 1,331,000 square feet, respectively. The corresponding average flux for these areas was 39.3, 14.5,

and 0 pCi/m^{2}s, respectively.

Since all but the top of the LTP has rock cover, canisters were placed on the top of the pile. The average measured flux was 51.8 pCi/m^{2}s. This compares to 42.1 pCi/m^{2}s measured in 1995. In the earlier data, the average flux on the sides of the pile was 3.27 pCi/m^{2}s, which constitutes 65 percent of the area. If one assumes that the flux on the side slopes remains constant, the average flux for the pile now is 20.3 pCi/m^{2}s. This compares favorably to the 17 pCi/m^{2}s measured in 1994-1995 but is significantly higher than the 14 pCi/m^2 in 2003.

The data show that the small tailings averages far below the 20 pCi/m^{2}s standard in 10 CFR 40 Appendix A. The large tailings pile slightly exceeds the standard but should be considered as meeting the standard if the errors in estimating relative sizes of the portions of the large tailings pile and the measurement errors are considered.

4. Quality Assurance

The EPA Method 115 requirements were met for the measurements. No rainfall was reported during the 24 hours prior to the measurements. Also the temperature exceeded 35 degrees F.

The attachment includes data where every 10th canister was reanalyzed. Agreement between measurements was within ten percent and consistent with state-of-the art gamma spectroscopy results.

Two independent sources were used to calibrate the spectrometer, using identical geometry conditions to that of the canisters. Agreement between calibration factors was within eight percent of the mean. The results of these measurements are included in the attachment.

Two trip blanks (Canister Nos. 71 and 91) were included in the batch and counted without exposing them to radon. The measured flux of 0.44 and 0.43 pCi/m^{2}s for the canister is near the expected 0 pCi/m^{2}s value. These results indicate that the canisters had not been exposed, confirming the integrity of the bags.

Two sets of duplicates were placed. Canisters 34 and 27 were placed at Waypoint Nos. 15 and 16. The radon flux results for these two canisters are 42.03 and 31.16 pCi/m^{2}s, respectively. Duplicate canisters 107 and 14 were placed at Waypoint Nos. 19 and 20, respectively. The radon flux results for these two canisters are 4.86 and 4.55 pCi/m^{2}s, respectively. The agreement is better than expected since the canisters were only placed near one another, and weren't true duplicates.

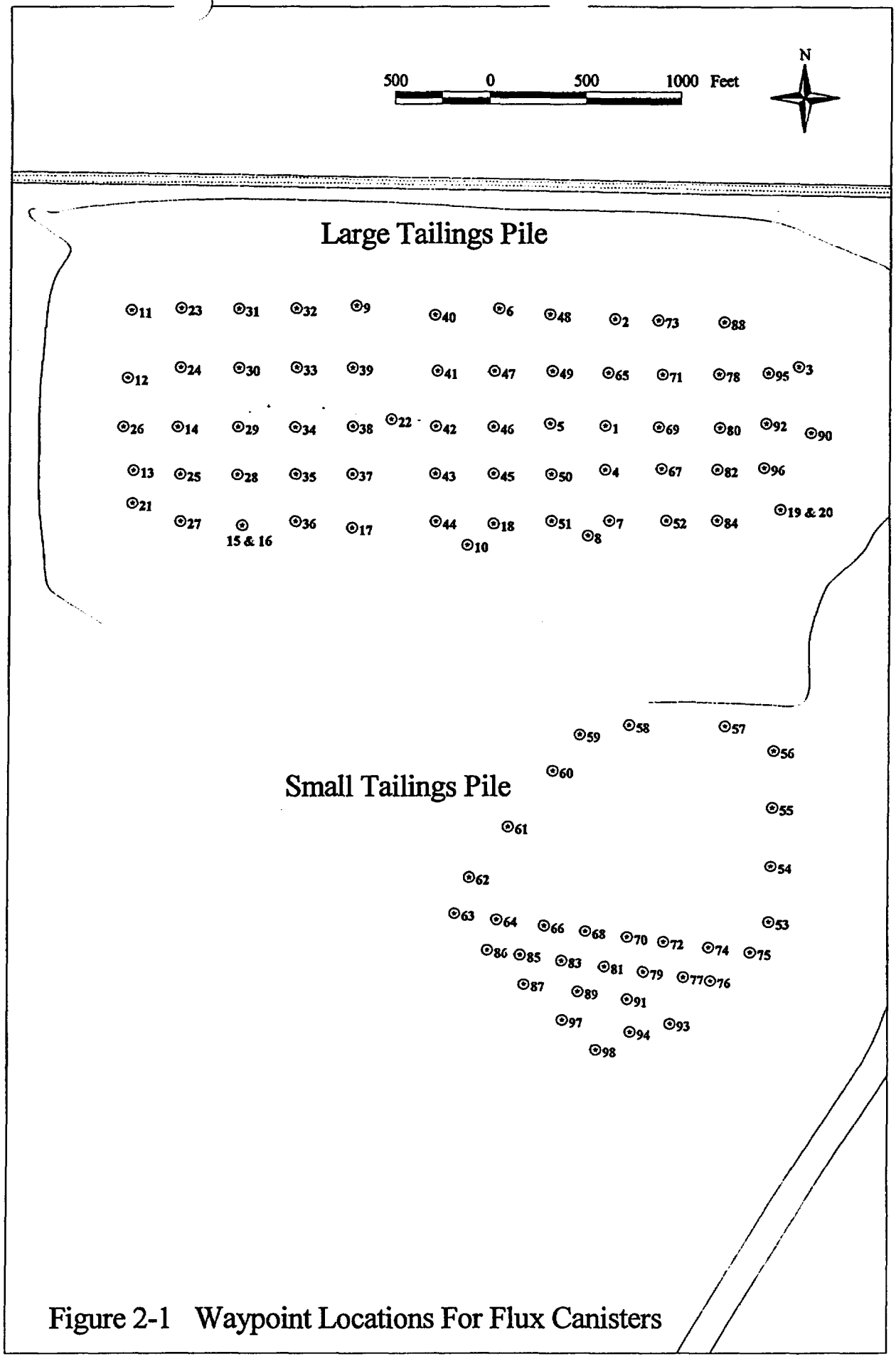

Figure 2-1 Waypoint Locations For Flux Canisters

Table 2-1 Large Tailings Pile Flux Measurements (pCi/m^{2}s)

Location	Canister No.	Flux	Error		Location	Canister No.	Flux	Error
1	40	28.80	0.39		35	67	172.92	1.32
2	258	126.08	1.69		36	58	3.18	0.05
3	256	7.82	0.13		37	84	209.10	1.55
4	57	76.95	1.04		38	39	5.69	0.09
5	72	2.30	0.05		39	252	39.25	0.52
6	60	32.60	0.44		40	64	34.99	0.48
7	81	105.99	1.40		41	63	17.97	0.25
8	62	54.10	0.72		42	257	7.85	0.12
9	29	51.25	0.70		43	35	98.15	1.20
10	260	91.99	0.93		44	9	31.83	0.42
11	262	5.80	0.08		45	22	8.51	0.14
12	110	6.26	0.11		46	42	1.33	0.05
13	23	8.86	0.09		47	11	65.53	0.84
14	17	106.50	4.51		48	88	26.26	0.36
15	34	42.03	0.58		49	254	43.79	0.41
16	27	31.16	0.41		50	93	3.32	0.06
17	20	36.66	0.38		51	43	39.82	0.51
18	50	17.59	0.26		52	25	91.95	1.25
19	107	4.86	0.08		65	87	6.80	0.11
20	14	4.55	0.07		67	102	3.25	0.06
21	59	3.82	0.07		69	78	2.02	0.05
22	92	153.67	1.22		71	263	1.52	0.05
23	41	42.11	0.55		73	28	147.96	1.55
24	66	205.97	2.41		78	80	35.22	0.42
25	70	101.86	1.38		80	56	57.57	0.58
26	108	36.55	0.49		82	104	3.80	0.07
27	61	8.95	0.15		84	79	62.83	0.76
28	94	99.24	1.29		88	1	54.37	0.74
29	259	1.69	0.05		90	8	5.44	0.10
30	76	69.77	0.91		92	37	28.08	0.40
31	53	156.25	2.10		95	261	5.10	0.09
32	19	170.60	1.86		96	203	46.24	0.65
33	7	163.69	2.01			Average	51.81	
34	101	1.82	0.05					

Table 2-2 Small Tailings Pile Flux Measurements (pCi/m^{2}s)			
Location	Canister No.	Flux	Error
53	10	58.04	0.77
54	105	82.88	1.05
55	69	84.57	0.97
56	45	8.40	0.13
57	73	5.73	0.10
58	251	8.83	0.14
59	55	57.70	0.74
60	201	16.16	0.24
61	75	19.96	0.27
62	33	50.53	0.65
63	13	5.94	0.10
64	2	4.73	0.07
66	54	7.43	0.12
68	106	9.44	0.15
70	103	13.22	0.18
72	38	11.19	0.17
74	82	15.14	0.21
75	90	29.60	0.37
76	46	17.21	0.24
77	6	11.02	0.17
79	4	16.46	0.22
81	202	39.62	0.48
83	49	15.35	0.22
85	98	5.02	0.09
86	85	6.86	0.11
87	109	4.34	0.08
88	1	54.37	1.25
89	52	2.19	0.06
93	99	24.34	0.35
94	51	24.39	0.35
95	36	8.67	0.14
97	16	4.13	0.08
98	86	2.83	0.06
	Average	22.01	

Repeat Analysis of Flux Canisters (pCi/m^2s)

Canister No.	Average Flux	First Count	Second Count
17	106.45	104.70	108.20
251	8.83	8.89	8.76
62	54.10	54.80	53.40
60	32.60	33.10	32.10
87	6.80	6.77	6.82
81	106.00	105.50	106.50
101	1.82	1.90	1.73
90	29.60	29.70	29.50
251	8.83	8.89	8.76
36	8.67	8.69	8.65
2	4.73	4.75	4.70

Determining Detector Counting Efficiency for Canberra System

Date	Count time	Standard (nCi)	Counts	Bkg Counts	Efficiency	% difference
8/12/2004	1200	80	45925	2803	0.01214	5.91057797
8/12/04	1200	78.83	39882	2803	0.01059	-7.6117775
8/13/04	1200	80	45740	2629	0.01214	5.91057797
8/13/2004	1200	78.83	41075	2629	0.01098	-4.2093784
					0.011463	

Radon Flux Measurements for HMC Grants Site

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

*Background counts/1200 sec

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
61	8/13/2004	12:49	8/11/2004	13:01	08/12/04	13:16	87300	370	5579	2677	1.15E-02	1.85E+04	8.95	0.15	0.3
29	8/13/2004	13:00	8/11/2004	12:13	08/12/04	12:46	88380	77	5870	2677	1.15E-02	9.78E+04	51.25	0.70	0.6
19	8/13/2004	13:04	8/11/2004	12:16	08/12/04	12:47	88260	35	8686	2677	1.15E-02	4.05E+05	170.60	1.86	0.9
66	8/13/2004	13:08	8/11/2004	12:26	08/12/04	12:56	88200	25	7479	2677	1.15E-02	4.53E+05	205.97	2.41	1.0
27	8/13/2004	13:10	8/11/2004	12:45	08/12/04	13:15	88200	143	6755	2677	1.15E-02	6.72E+04	31.16	0.41	0.4
11	8/13/2004	13:15	8/11/2004	11:45	08/12/04	13:04	91140	65	6472	2677	1.15E-02	1.38E+05	65.53	0.84	0.6
17A	8/13/2004	13:18	8/11/2004	12:57	08/12/04	13:23	87960	43	6586	2677	1.15E-02	2.14E+05	104.73	1.32	0.8
17B	8/13/2004	13:19	8/11/2004	12:57	08/12/04	13:23	87960	38	6010	2677	1.15E-02	2.07E+05	108.21	1.43	0.8
108	8/13/2004	13:23	8/11/2004	13:07	08/12/04	13:19	87120	118	6417	2677	1.15E-02	7.47E+04	36.55	0.49	0.5
63	8/13/2004	13:27	8/11/2004	11:42	08/12/04	13:03	91260	223	6445	2677	1.15E-02	3.98E+04	17.97	0.25	0.3
69	8/13/2004	13:36	8/11/2004	09:14	08/12/04	09:57	88980	66	8050	2677	1.15E-02	1.92E+05	84.57	0.97	0.6
45	8/13/2004	13:39	8/11/2004	08:00	08/12/04	09:59	93540	471	6908	2677	1.15E-02	2.12E+04	8.40	0.13	0.2
98	8/13/2004	13:49	8/11/2004	08:49	08/12/04	08:44	86100	786	7113	2677	1.15E-02	1.33E+04	5.02	0.09	0.2
6	8/13/2004	14:06	8/11/2004	08:25	08/12/04	08:51	87960	367	6416	2677	1.15E-02	2.40E+04	11.02	0.17	0.3
13	8/13/2004	14:15	8/11/2004	08:11	08/12/04	08:37	87960	673	7011	2677	1.15E-02	1.52E+04	5.94	0.10	0.2
16	8/13/2004	14:28	8/11/2004	08:55	08/12/04	08:47	85920	948	7393	2677	1.15E-02	1.17E+04	4.13	0.08	0.2
55	8/13/2004	14:46	8/11/2004	08:03	08/12/04	08:30	88020	81	6604	2677	1.15E-02	1.14E+05	57.70	0.74	0.6
251A	8/13/2004	14:49	8/11/2004	08:01	08/12/04	08:30	88140	398	5756	2677	1.15E-02	1.82E+04	8.89	0.15	0.3
251B	8/13/2004	14:57	8/11/2004	08:01	08/12/04	08:30	88140	517	7373	2677	1.15E-02	2.14E+04	8.76	0.13	0.2
109	8/13/2004	15:08	8/11/2004	08:52	08/12/04	08:45	85980	1001	8066	2677	1.15E-02	1.27E+04	4.34	0.08	0.2
73	8/13/2004	15:29	8/11/2004	08:00	08/12/04	08:20	87600	688	6886	2677	1.15E-02	1.44E+04	5.73	0.10	0.2
33	8/13/2004	15:43	8/11/2004	08:09	08/12/04	08:35	87960	92	6549	2677	1.15E-02	9.92E+04	50.53	0.65	0.6
75	8/13/2004	15:46	8/11/2004	08:07	08/12/04	08:34	88020	232	6838	2677	1.15E-02	4.23E+04	19.96	0.27	0.3

Reviewed by _____

Radon Flux Measurements for HMC Grants Site

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

*Background counts/1200 sec

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
262	8/12/2004	17:40	8/11/2004	12:23	08/12/04	12:51	88080	800	9518	2677	1.15E-02	2.02E+04	5.80	0.08	0.2
41	8/12/2004	17:55	8/11/2004	12:21	08/12/04	12:50	88140	90	6508	2677	1.15E-02	1.00E+05	42.11	0.55	0.5
23	8/12/2004	17:59	8/11/2004	13:05	08/12/04	13:18	87180	877	14791	2677	1.15E-02	3.26E+04	8.86	0.09	0.1
92	8/12/2004	18:15	8/11/2004	11:39	08/12/04	13:38	93540	60	16388	2677	1.15E-02	5.39E+05	153.67	1.22	0.5
39	8/12/2004	18:18	8/11/2004	11:37	08/12/04	13:35	93480	540	6613	2677	1.15E-02	1.72E+04	5.69	0.09	0.2
67	8/12/2004	18:30	8/11/2004	12:40	08/12/04	13:23	88980	60	17547	2677	1.15E-02	5.84E+05	172.92	1.32	0.6
84	8/12/2004	18:33	8/11/2004	11:35	08/12/04	13:33	93480	50	18479	2677	1.15E-02	7.45E+05	209.10	1.55	0.6
107	8/12/2004	18:37	8/11/2004	13:15	08/12/04	13:50	88500	722	7487	2677	1.15E-02	1.57E+04	4.86	0.08	0.2
58	8/12/2004	18:52	8/11/2004	12:41	08/12/04	13:24	88980	1200	9067	2677	1.15E-02	1.26E+04	3.18	0.05	0.1
101A	8/12/2004	19:13	8/11/2004	12:37	08/12/04	13:21	89040	1200	6487	2677	1.15E-02	7.49E+03	1.90	0.05	0.1
101B	8/12/2004	19:35	8/11/2004	12:37	08/12/04	13:21	89040	1200	6132	2677	1.15E-02	6.79E+03	1.73	0.05	0.1
34	8/12/2004	19:57	8/11/2004	12:45	08/12/04	13:15	88200	80	5710	2677	1.15E-02	8.94E+04	42.03	0.58	0.5
20	8/12/2004	20:00	8/11/2004	11:31	08/12/04	13:31	93600	160	10558	2677	1.15E-02	1.16E+05	36.66	0.38	0.3
14	8/12/2004	20:05	8/11/2004	13:15	08/12/04	13:50	88500	1004	9790	2677	1.15E-02	1.67E+04	4.55	0.07	0.1
37	8/12/2004	20:20	8/11/2004	10:01	08/12/04	10:55	89640	120	5780	2677	1.15E-02	6.10E+04	28.08	0.40	0.4
254	8/12/2004	20:27	8/11/2004	11:57	08/12/04	13:46	92940	150	11667	2677	1.15E-02	1.41E+05	43.79	0.42	0.3
102	8/12/2004	20:32	8/11/2004	10:06	08/12/04	10:47	88860	1060	7927	2677	1.15E-02	1.17E+04	3.25	0.06	0.1
91	8/12/2004	20:52	8/11/2004	08:00	08/12/04	08:00	86400	1200	3495	2677	1.15E-02	1.61E+03	0.44	0.04	0.1
79	8/12/2004	21:14	8/11/2004	10:16	08/12/04	10:50	88440	70	7210	2677	1.15E-02	1.53E+05	62.83	0.76	0.5
42	8/12/2004	21:16	8/11/2004	11:21	08/12/04	11:29	86880	1200	5211	2677	1.15E-02	4.98E+03	1.33	0.05	0.1
90A	8/12/2004	21:38	8/11/2004	08:21	08/12/04	09:00	88740	144	7091	2677	1.15E-02	7.23E+04	29.72	0.38	0.4
90B	8/12/2004	21:42	8/11/2004	08:21	08/12/04	09:00	88740	149	7286	2677	1.15E-02	7.29E+04	29.52	0.37	0.4
71	8/12/2004	21:45	8/11/2004	08:00	08/12/04	08:00	86400	1200	3475	2677	1.15E-02	1.57E+03	0.43	0.04	0.1

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Radon Flux Measurements for HMC Grants Site

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

*Background counts/1200 sec

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
202	8/13/2004	05:37	8/11/2004	08:28	08/12/04	08:53	87900	124	7523	2677	1.15E-02	9.21E+04	39.62	0.48	0.4
103	8/13/2004	05:42	8/11/2004	08:17	08/12/04	09:04	89220	320	7043	2677	1.15E-02	3.22E+04	13.22	0.18	0.3
82	8/13/2004	05:50	8/11/2004	08:20	08/12/04	09:01	88860	282	6983	2677	1.15E-02	3.60E+04	15.14	0.21	0.3
28	8/13/2004	06:17	8/11/2004	09:44	08/12/04	10:28	89040	42	9434	2677	1.15E-02	3.79E+05	147.96	1.55	0.8
56	8/13/2004	06:20	8/11/2004	09:59	08/12/04	10:53	89640	120	10743	2677	1.15E-02	1.58E+05	57.57	0.58	0.4
8	8/13/2004	06:35	8/11/2004	10:52	08/12/04	11:03	87060	625	6411	2677	1.15E-02	1.41E+04	5.44	0.10	0.2
78	8/13/2004	06:44	8/11/2004	09:57	08/12/04	10:45	89280	1200	6320	2677	1.15E-02	7.16E+03	2.02	0.05	0.1
104	8/13/2004	07:17	8/11/2004	10:04	08/12/04	10:52	89280	929	7357	2677	1.15E-02	1.19E+04	3.80	0.07	0.2
87A	8/13/2004	07:44	8/11/2004	09:30	08/12/04	10:44	90840	610	7620	2677	1.15E-02	1.91E+04	6.77	0.10	0.2
87B	8/13/2004	08:05	8/11/2004	09:30	08/12/04	10:44	90840	581	7287	2677	1.15E-02	1.87E+04	6.82	0.11	0.2
88	8/13/2004	08:17	8/11/2004	09:40	08/12/04	10:31	89460	150	6193	2677	1.15E-02	5.53E+04	26.26	0.36	0.4
1	8/13/2004	08:21	8/11/2004	09:47	08/12/04	10:26	88740	72	5934	2677	1.15E-02	1.07E+05	54.37	0.74	0.6
25	8/13/2004	08:24	8/11/2004	10:13	08/12/04	10:49	88560	41	5655	2677	1.15E-02	1.71E+05	91.95	1.25	0.8
9	8/13/2004	08:26	8/11/2004	11:26	08/12/04	11:34	86880	136	6616	2677	1.15E-02	6.83E+04	31.83	0.42	0.4
258	8/13/2004	08:29	8/11/2004	10:59	08/12/04	11:07	86880	31	5747	2677	1.15E-02	2.33E+05	126.08	1.69	0.9
57	8/13/2004	08:31	8/11/2004	10:08	08/12/04	11:15	90420	49	5794	2677	1.15E-02	1.50E+05	76.95	1.04	0.7
80	8/13/2004	08:36	8/11/2004	09:50	08/12/04	10:37	89220	143	7780	2677	1.15E-02	8.41E+04	35.22	0.42	0.4
93	8/13/2004	08:41	8/11/2004	11:10	08/12/04	11:21	87060	1134	8007	2677	1.15E-02	1.11E+04	3.32	0.06	0.1
203	8/13/2004	09:03	8/11/2004	10:03	08/12/04	10:57	89640	79	5606	2677	1.15E-02	8.74E+04	46.24	0.65	0.6
81A	8/13/2004	09:05	8/11/2004	10:10	08/12/04	11:16	90360	37	5938	2677	1.15E-02	2.08E+05	105.47	1.40	0.8
81B	8/13/2004	09:08	8/11/2004	10:10	08/12/04	11:16	90360	37	5993	2677	1.15E-02	2.11E+05	106.50	1.40	0.8
72	8/13/2004	09:10	8/11/2004	10:39	08/12/04	11:24	89100	1200	6759	2677	1.15E-02	8.02E+03	2.30	0.05	0.1
257	8/13/2004	09:33	8/11/2004	11:23	08/12/04	11:37	87240	492	6700	2677	1.15E-02	1.93E+04	7.85	0.12	0.2

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Radon Flux Measurements for HMC Grants Site

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

*Background counts/1200 sec

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s
263	8/13/2004	09:43	8/11/2004	09:52	08/12/04	10:35	88980	1200	5338	2677	1.15E-02	5.23E+03	1.52	0.05	0.1
35	8/13/2004	10:07	8/11/2004	11:25	08/12/04	11:35	87000	49	7043	2677	1.15E-02	2.10E+05	98.15	1.20	0.7
22	8/13/2004	10:13	8/11/2004	11:19	08/12/04	11:30	87060	426	6168	2677	1.15E-02	1.93E+04	8.51	0.14	0.2
50	8/13/2004	10:21	8/11/2004	11:17	08/12/04	11:32	87300	215	5938	2677	1.15E-02	3.58E+04	17.59	0.26	0.3
261	8/13/2004	10:27	8/11/2004	09:49	08/12/04	10:39	89400	759	7350	2677	1.15E-02	1.45E+04	5.10	0.09	0.2
40	8/13/2004	10:41	8/11/2004	09:55	08/12/04	11:15	91200	138	6248	2677	1.15E-02	6.10E+04	28.80	0.39	0.4
256	8/13/2004	10:46	8/11/2004	10:54	08/12/04	11:00	86760	490	6548	2677	1.15E-02	1.86E+04	7.82	0.13	0.2
62A	8/13/2004	10:56	8/11/2004	11:14	08/12/04	11:18	86640	82	6584	2677	1.15E-02	1.12E+05	54.80	0.70	0.6
62B	8/13/2004	10:58	8/11/2004	11:14	08/12/04	11:18	86640	75	5867	2677	1.15E-02	1.00E+05	53.37	0.73	0.6
260	8/13/2004	11:01	8/11/2004	11:28	08/12/04	11:33	86700	77	10280	2677	1.15E-02	2.33E+05	91.99	0.93	0.6
43	8/13/2004	11:10	8/11/2004	11:11	08/12/04	11:20	86940	116	6849	2677	1.15E-02	8.48E+04	39.82	0.51	0.5
259	8/13/2004	11:16	8/11/2004	12:49	08/12/04	13:12	87780	1200	5624	2677	1.15E-02	5.79E+03	1.69	0.05	0.1
76	8/13/2004	11:47	8/11/2004	12:28	08/12/04	12:57	88140	60	6227	2677	1.15E-02	1.39E+05	69.77	0.91	0.7
252	8/13/2004	11:52	8/11/2004	12:11	08/12/04	13:00	89340	106	6365	2677	1.15E-02	8.20E+04	39.25	0.52	0.5
70	8/13/2004	11:56	8/11/2004	12:59	08/12/04	13:24	87900	38	5718	2677	1.15E-02	1.89E+05	101.86	1.38	0.8
94	8/13/2004	12:00	8/11/2004	12:47	08/12/04	13:13	87960	42	6152	2677	1.15E-02	1.95E+05	99.24	1.29	0.8
64	8/13/2004	12:03	8/11/2004	12:01	08/12/04	12:45	89040	114	6094	2677	1.15E-02	7.07E+04	34.99	0.48	0.5
53	8/13/2004	12:07	8/11/2004	12:18	08/12/04	12:48	88200	25	5725	2677	1.15E-02	2.87E+05	156.25	2.10	1.0
60A	8/13/2004	12:10	8/11/2004	11:59	08/12/04	12:43	89040	120	6069	2677	1.15E-02	6.66E+04	33.06	0.45	0.5
60B	8/13/2004	12:12	8/11/2004	11:59	08/12/04	12:43	89040	132	6497	2677	1.15E-02	6.82E+04	32.14	0.43	0.4
110	8/13/2004	12:17	8/11/2004	12:24	08/12/04	12:53	88140	562	6352	2677	1.15E-02	1.54E+04	6.26	0.11	0.2
59	8/13/2004	12:29	8/11/2004	13:03	08/12/04	13:17	87240	859	6634	2677	1.15E-02	1.09E+04	3.82	0.07	0.2
7	8/13/2004	12:47	8/11/2004	12:30	08/12/04	11:59	84540	30	6847	2677	1.15E-02	3.28E+05	163.69	2.01	1.0

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Radon Flux Measurements for HMC Grants Site

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

*Background counts/1200 sec

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
105	8/13/2004	15:52	8/11/2004	09:13	08/12/04	09:56	88980	56	6584	2677	1.15E-02	1.64E+05	82.88	1.05	0.7	OK
38	8/13/2004	15:55	8/11/2004	08:18	08/12/04	09:02	89040	370	6546	2677	1.15E-02	2.47E+04	11.19	0.17	0.3	OK
106	8/13/2004	16:03	8/11/2004	08:16	08/12/04	09:06	89400	432	6618	2677	1.15E-02	2.15E+04	9.44	0.15	0.2	OK
46	8/13/2004	16:13	8/11/2004	08:23	08/12/04	08:57	88440	251	6476	2677	1.15E-02	3.57E+04	17.21	0.24	0.3	OK
99	8/13/2004	16:19	8/11/2004	08:59	08/12/04	09:47	89280	163	5876	2677	1.15E-02	4.63E+04	24.34	0.35	0.4	OK
36A	8/13/2004	16:24	8/11/2004	08:58	08/12/04	09:28	88200	469	6629	2677	1.15E-02	1.99E+04	8.69	0.14	0.2	OK
36B	8/13/2004	16:33	8/11/2004	08:58	08/12/04	09:28	88200	477	6708	2677	1.15E-02	1.99E+04	8.65	0.14	0.2	OK
85	8/13/2004	16:44	8/11/2004	08:50	08/12/04	08:40	85800	629	7118	2677	1.15E-02	1.66E+04	6.86	0.11	0.2	OK
201	8/13/2004	16:56	8/11/2004	08:05	08/12/04	08:32	88020	248	5972	2677	1.15E-02	3.13E+04	16.16	0.24	0.3	OK
86	8/13/2004	17:02	8/11/2004	09:04	08/12/04	09:25	87660	1200	7272	2677	1.15E-02	9.03E+03	2.83	0.06	0.2	OK
49	8/13/2004	17:25	8/11/2004	08:30	08/12/04	09:12	88920	276	6404	2677	1.15E-02	3.18E+04	15.35	0.22	0.3	OK
54	8/13/2004	17:32	8/11/2004	08:15	08/12/04	09:07	89520	567	7045	2677	1.15E-02	1.82E+04	7.43	0.12	0.2	OK
51	8/13/2004	17:44	8/11/2004	09:02	08/12/04	09:30	88080	167	5892	2677	1.15E-02	4.54E+04	24.39	0.35	0.4	OK
10	8/13/2004	17:48	8/11/2004	09:14	08/12/04	09:54	88800	75	6125	2677	1.15E-02	1.08E+05	58.04	0.77	0.6	OK
4	8/13/2004	17:51	8/11/2004	08:27	08/12/04	08:55	88080	293	7154	2677	1.15E-02	3.60E+04	16.46	0.22	0.3	OK
52	8/13/2004	17:58	8/11/2004	08:54	08/12/04	09:45	89460	1200	6289	2677	1.15E-02	7.10E+03	2.19	0.06	0.1	OK
2A	8/13/2004	18:20	8/11/2004	08:13	08/12/04	08:43	88200	838	7214	2677	1.15E-02	1.28E+04	4.75	0.08	0.2	OK
2B	8/13/2004	18:35	8/11/2004	08:13	08/12/04	08:43	88200	1200	10230	2677	1.15E-02	1.48E+04	4.70	0.07	0.2	OK

Reviewed by _____

Radon Flux Measurements for the HMC Tailings Piles

July 2005

Prepared for:

Homestake Mining Company of California
P. O. Box 98
Grants, New Mexico 87020

Prepared by:

Environmental Restoration Group, Inc.
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Radon Flux Measurements for the HMC Tailings Piles

1. Introduction

Reclamation activities associated with The Large Tailings Pile (LTP) at the Grants Uranium Mill, owned by Homestake Mining Company of California (HMC), were completed in phases. The pile was contoured in 1994 at which time an interim cover was placed on the top of the pile to control the dispersal of tailings by wind and water erosion. Radon barrier was applied to the north, west, and south side slopes, with completion of the work in 1994. Radon flux measurements were made on these side slopes on October 24-25, 1994. Completion of the placement of radon barrier on the east side slope and aprons occurred just prior to making the radon flux measurements on July 24-25, 1995. An evaporation pond was constructed on the Small Tailings Pile (STP) and an interim cover placed on the remainder of the pile. Radon flux measurements were made on the top of the LTP and the interim cover of the Small Tailings Pile (STP) on August 18-19, 1995.

As part of a request for a license amendment extending the milestones in the NRC License, radon flux measurements were repeated in the areas with interim cover on October 21-22, 2003. This license amendment required HMC to repeat these measurements annually. This report presents the data for the Year 2005 flux measurements made on July 11-12, 2005.

2. Radon Flux Results

The results of the flux measurements on the LTP and STP are presented in Table 2-1 and Table 2-2, respectively. Nintey-seven canister locations (waypoint numbers) were established on the piles as shown in Figure 2-1. Waypoints 8 and 49, 37 and 52, 53 and 80, as well as 58 and 63 are considered duplicates, with the canisters placed adjacent to one another. A total of 101 flux readings were made on the piles.

The distribution of canisters was allocated so that each canister represented an equal area of the total pile surface. Measurements are reported for 61 locations on the LTP and 36 locations on the STP. The average measured flux was 37.3 pCi/m^2s and 35.2 pCi/m^2s for the LTP and STP, respectively.

Field and laboratory data sheets are attached.

3. Average Pile Flux

Since all but the top of the LTP has rock cover, canisters were placed on the top of the pile. The average measured flux was 37.3 pCi/m^2s. This compares to 42.1 pCi/m^2s measured in 1995. In the earlier data, the average flux on the sides of the pile was 3.27 pCi/m^2s, which constitutes 65 percent of the area. If one assumes that the flux on the side slopes remains constant, the average flux for the pile now is 15.3 pCi/m^2s. This is higher than the 14 pCi/m^2 measured in 2003 but compares

Table 2-1 **Radon Flux Measurements for HMC Grants Site - LTP**

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
2	7/13/2005	06:10	7/11/2005	09:05	07/12/05	09:16	87060	1200	5975	2881	1.20E-02	5.79E+03	1.68	0.05	0.1	OK
3	7/13/2005	07:03	7/11/2005	09:11	07/12/05	09:20	86940	56	7069	2881	1.20E-02	1.68E+05	81.30	1.00	0.7	OK
4	7/13/2005	11:35	7/11/2005	07:45	07/12/05	08:30	89100	99	6552	2881	1.20E-02	8.32E+04	42.64	0.56	0.5	OK
7	7/13/2005	12:35	7/11/2005	08:19	07/12/05	08:50	88260	50	7955	2881	1.20E-02	2.28E+05	106.20	1.22	0.7	OK
8	7/13/2005	06:32	7/11/2005	08:15	07/12/05	08:48	88380	80	9752	2881	1.20E-02	1.93E+05	77.30	0.81	0.5	OK
10	7/13/2005	17:04	7/11/2005	10:40	07/12/05	11:22	88920	73	7594	2881	1.20E-02	1.45E+05	69.43	0.82	0.6	OK
13	7/13/2005	07:49	7/11/2005	08:36	07/12/05	09:03	88020	60	10883	2881	1.20E-02	2.99E+05	117.12	1.15	0.6	OK
14	7/13/2005	11:05	7/11/2005	08:46	07/12/05	09:07	87660	1200	5329	2881	1.20E-02	4.58E+03	1.37	0.05	0.1	OK
19	7/12/2005	23:37	7/11/2005	09:17	07/12/05	09:23	86760	1200	4430	2881	1.20E-02	2.90E+03	0.80	0.04	0.1	OK
20	7/13/2005	07:05	7/11/2005	09:08	07/12/05	09:18	87000	790	10474	2881	1.20E-02	2.16E+04	7.13	0.09	0.2	OK
22	7/13/2005	16:15	7/11/2005	11:05	07/12/05	11:52	89220	476	6918	2881	1.20E-02	1.90E+04	8.19	0.13	0.2	OK
27	7/13/2005	10:02	7/11/2005	08:00	07/12/05	08:37	88620	1125	7681	2881	1.20E-02	9.57E+03	2.94	0.06	0.1	OK
29	7/13/2005	15:36	7/11/2005	11:00	07/12/05	11:40	88800	46	6603	2881	1.20E-02	1.82E+05	95.26	1.20	0.8	OK
34	7/13/2005	09:59	7/11/2005	07:42	07/12/05	08:29	89220	45	6041	2881	1.20E-02	1.58E+05	86.99	1.15	0.8	OK
37	7/13/2005	11:42	7/11/2005	07:51	07/12/05	08:32	88860	72	6783	2881	1.20E-02	1.22E+05	61.57	0.78	0.6	OK
40	7/13/2005	08:45	7/11/2005	08:08	07/12/05	08:44	88560	324	6520	2881	1.20E-02	2.52E+04	11.64	0.17	0.3	OK
42	7/13/2005	15:33	7/11/2005	11:20	07/12/05	11:48	88080	47	5543	2881	1.20E-02	1.27E+05	78.45	1.09	0.8	OK
43	7/13/2005	17:31	7/11/2005	10:28	07/12/05	11:17	89340	50	9904	2881	1.20E-02	3.15E+05	133.64	1.37	0.7	OK
47	7/13/2005	12:38	7/11/2005	08:28	07/12/05	08:52	87840	121	6177	2881	1.20E-02	6.11E+04	33.12	0.45	0.5	OK
49	7/13/2005	11:28	7/11/2005	08:15	07/12/05	08:48	88380	74	6039	2881	1.20E-02	9.58E+04	53.18	0.72	0.6	OK
50	7/13/2005	09:22	7/11/2005	08:06	07/12/05	08:42	88560	1200	4878	2881	1.20E-02	3.73E+03	1.10	0.05	0.1	OK
52	7/13/2005	11:32	7/11/2005	07:51	07/12/05	08:32	88860	84	6092	2881	1.20E-02	8.58E+04	46.97	0.63	0.6	OK
54	7/13/2005	15:38	7/11/2005	11:58	07/12/05	11:42	85440	85	6179	2881	1.20E-02	8.71E+04	49.14	0.66	0.6	OK
56	7/13/2005	16:49	7/11/2005	10:49	07/12/05	11:28	88740	711	8017	2881	1.20E-02	1.62E+04	6.06	0.09	0.2	OK
58	7/13/2005	09:00	7/11/2005	07:05	07/12/05	08:10	90300	1200	5323	2881	1.20E-02	4.57E+03	1.32	0.05	0.1	OK

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Table 2-1

Radon Flux Measurements for HMC Grants Site - LTP

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
59	7/13/2005	17:11	7/11/2005	10:11	07/12/05	11:12	90060	63	7008	2881	1.20E-02	1.47E+05	73.65	0.91	0.6	OK
61	7/13/2005	15:53	7/11/2005	11:17	07/12/05	11:50	88380	1200	5006	2881	1.20E-02	3.97E+03	1.20	0.05	0.1	OK
62	7/13/2005	15:49	7/11/2005	14:25	07/12/05	11:45	76800	112	6352	2881	1.20E-02	6.95E+04	41.92	0.56	0.5	OK
63	7/13/2005	10:24	7/11/2005	07:05	07/12/05	08:10	90300	1200	5539	2881	1.20E-02	4.97E+03	1.46	0.05	0.1	OK
64	7/13/2005	06:54	7/11/2005	09:25	07/12/05	09:27	86520	504	7234	2881	1.20E-02	1.94E+04	7.87	0.12	0.2	OK
66	7/13/2005	17:20	7/11/2005	10:45	07/12/05	11:30	89100	452	6513	2881	1.20E-02	1.80E+04	8.20	0.13	0.2	OK
67	7/13/2005	07:43	7/11/2005	09:01	07/12/05	09:15	87240	194	12313	2881	1.20E-02	1.09E+05	40.20	0.38	0.4	OK
68	7/12/2005	22:37	7/11/2005	08:11	07/12/05	08:45	88440	42	6278	2881	1.20E-02	1.81E+05	89.59	1.16	0.7	OK
69	7/13/2005	17:33	7/11/2005	10:25	07/12/05	11:16	89460	170	12801	2881	1.20E-02	1.31E+05	49.75	0.46	0.4	OK
70	7/12/2005	21:02	7/11/2005	14:15	07/12/05	14:20	86700	642	7409	2881	1.20E-02	1.58E+04	5.37	0.09	0.2	OK
71	7/13/2005	17:03	7/11/2005	10:31	07/12/05	11:20	89340	56	7340	2881	1.20E-02	1.79E+05	87.54	1.05	0.7	OK
73	7/12/2005	23:01	7/11/2005	07:34	07/12/05	08:25	89460	864	7671	2881	1.20E-02	1.24E+04	3.93	0.07	0.2	OK
76	7/13/2005	13:06	7/11/2005	08:32	07/12/05	08:53	87660	1200	8644	2881	1.20E-02	1.08E+04	3.29	0.06	0.1	OK
78	7/13/2005	06:36	7/11/2005	08:59	07/12/05	09:13	87240	882	12189	2881	1.20E-02	2.37E+04	7.46	0.09	0.2	OK
84	7/13/2005	11:38	7/11/2005	07:56	07/12/05	08:35	88740	90	6152	2881	1.20E-02	8.16E+04	44.25	0.59	0.5	OK
85	7/13/2005	16:44	7/11/2005	11:22	07/12/05	12:01	88740	72	5948	2881	1.20E-02	9.56E+04	54.49	0.74	0.6	OK
86	7/13/2005	15:41	7/11/2005	10:52	07/12/05	11:39	89220	337	6613	2881	1.20E-02	2.48E+04	11.59	0.17	0.3	OK
87	7/13/2005	10:46	7/11/2005	07:22	07/12/05	08:17	89700	316	6702	2881	1.20E-02	2.71E+04	12.44	0.18	0.3	OK
88	7/13/2005	09:56	7/11/2005	07:19	07/12/05	08:12	89580	66	6166	2881	1.20E-02	1.12E+05	59.94	0.79	0.6	OK
89	7/13/2005	09:54	7/11/2005	08:44	07/12/05	09:06	87720	47	6506	2881	1.20E-02	1.73E+05	90.66	1.15	0.7	OK
90	7/12/2005	23:35	7/11/2005	07:29	07/12/05	08:22	89580	58	7244	2881	1.20E-02	1.69E+05	74.51	0.90	0.6	OK
91	7/13/2005	12:06	7/11/2005	07:32	07/12/05	08:24	89520	1200	8141	2881	1.20E-02	9.84E+03	2.94	0.06	0.1	OK
93	7/13/2005	10:53	7/11/2005	07:10	07/12/05	08:15	90300	231	6044	2881	1.20E-02	3.07E+04	15.64	0.23	0.3	OK
94	7/13/2005	12:28	7/11/2005	07:25	07/12/05	08:20	89700	266	5753	2881	1.20E-02	2.42E+04	12.88	0.20	0.3	OK
99	7/13/2005	17:15	7/11/2005	10:21	07/12/05	11:14	89580	127	6354	2881	1.20E-02	6.14E+04	32.40	0.44	0.5	OK

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Table 2-1 **Radon Flux Measurements for HMC Grants Site - LTP**

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
101	7/13/2005	16:25	7/11/2005	11:14	07/12/05	11:59	89100	518	9092	2881	1.20E-02	2.69E+04	10.24	0.13	0.2	OK
102	7/13/2005	08:01	7/11/2005	08:23	07/12/05	08:51	88080	1200	5989	2881	1.20E-02	5.81E+03	1.70	0.05	0.1	OK
106	7/12/2005	23:32	7/11/2005	08:35	07/12/05	09:00	87900	40	8603	2881	1.20E-02	3.21E+05	130.94	1.44	0.7	OK
109	7/13/2005	11:44	7/11/2005	08:55	07/12/05	09:10	87300	1200	5839	2881	1.20E-02	5.53E+03	1.67	0.05	0.1	OK
110	7/13/2005	07:20	7/11/2005	09:23	07/12/05	09:25	86520	1200	8536	2881	1.20E-02	1.06E+04	3.12	0.06	0.1	OK
201	7/13/2005	17:28	7/11/2005	10:08	07/12/05	11:10	90120	68	7523	2881	1.20E-02	1.53E+05	73.38	0.87	0.6	OK
202	7/13/2005	16:46	7/11/2005	10:33	07/12/05	11:25	89520	55	6566	2881	1.20E-02	1.50E+05	79.22	1.01	0.7	OK
203	7/12/2005	19:21	7/11/2005	14:16	07/12/05	14:21	86700	1130	8828	2881	1.20E-02	1.18E+04	3.14	0.06	0.1	OK
251	7/13/2005	16:36	7/11/2005	10:55	07/12/05	11:36	88860	113	5901	2881	1.20E-02	6.00E+04	33.88	0.47	0.5	OK
254	7/13/2005	09:45	7/11/2005	07:39	07/12/05	08:26	89220	632	7087	2881	1.20E-02	1.49E+04	5.81	0.10	0.2	OK
255	7/12/2005	19:09	7/11/2005	14:12	07/12/05	14:18	86760	339	6998	2881	1.20E-02	2.73E+04	10.57	0.15	0.2	OK
258	7/12/2005	20:32	7/11/2005	14:17	07/12/05	14:22	86700	398	8174	2881	1.20E-02	2.98E+04	10.62	0.14	0.2	OK
259	7/13/2005	17:07	7/11/2005	10:00	07/12/05	11:08	90480	220	6291	2881	1.20E-02	3.48E+04	17.65	0.25	0.3	OK
263	7/12/2005	23:15	7/11/2005	08:41	07/12/05	09:05	87840	955	8195	2881	1.20E-02	1.25E+04	3.80	0.07	0.1	OK
251B	7/13/2005	16:39	7/11/2005	10:55	07/12/05	11:36	88860	120	6452	2881	1.20E-02	6.68E+04	34.94	0.47	0.5	OK
40B	7/13/2005	08:52	7/11/2005	08:08	07/12/05	08:44	88560	316	6349	2881	1.20E-02	2.46E+04	11.63	0.18	0.3	OK
59B	7/13/2005	17:13	7/11/2005	10:11	07/12/05	11:12	90060	77	8480	2881	1.20E-02	1.63E+05	72.92	0.82	0.6	OK
7B	7/13/2005	12:37	7/11/2005	08:19	07/12/05	08:50	88260	40	6410	2881	1.20E-02	1.98E+05	107.01	1.37	0.8	OK
8B	7/13/2005	06:34	7/11/2005	08:15	07/12/05	08:48	88380	73	8922	2881	1.20E-02	1.86E+05	77.53	0.85	0.6	OK
93B	7/13/2005	10:58	7/11/2005	07:10	07/12/05	08:15	90300	254	6703	2881	1.20E-02	3.38E+04	15.80	0.22	0.3	OK

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Table 2-2

Radon Flux Measurements for HMC Grants Site - STP

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
9	7/12/2005	21:15	7/11/2005	12:33	07/12/05	12:57	87840	221	5611	2881	1.20E-02	2.77E+04	13.51	0.21	0.3	OK
11	7/13/2005	14:32	7/11/2005	13:57	07/12/05	13:58	86460	44	13781	2881	1.20E-02	5.56E+05	209.54	1.81	0.8	OK
12	7/12/2005	18:58	7/11/2005	12:48	07/12/05	13:10	87720	646	7855	2881	1.20E-02	1.73E+04	5.64	0.09	0.2	OK
16	7/13/2005	14:18	7/11/2005	13:07	07/12/05	13:28	87660	678	7399	2881	1.20E-02	1.50E+04	5.68	0.09	0.2	OK
17	7/12/2005	18:37	7/11/2005	12:46	07/12/05	13:08	87720	426	6961	2881	1.20E-02	2.15E+04	8.03	0.12	0.2	OK
21	7/12/2005	20:12	7/11/2005	12:35	07/12/05	12:59	87840	1002	13389	2881	1.20E-02	2.35E+04	6.40	0.07	0.1	OK
25	7/12/2005	22:08	7/11/2005	13:47	07/12/05	13:49	86520	152	6077	2881	1.20E-02	4.72E+04	22.40	0.31	0.4	OK
28	7/12/2005	22:59	7/11/2005	12:11	07/12/05	12:39	88080	58	7254	2881	1.20E-02	1.69E+05	73.03	0.88	0.6	OK
31	7/12/2005	17:55	7/11/2005	12:41	07/12/05	13:05	87840	1200	9175	2881	1.20E-02	1.18E+04	3.01	0.05	0.1	OK
33	7/12/2005	22:15	7/11/2005	13:15	07/12/05	13:30	87300	810	7542	2881	1.20E-02	1.29E+04	4.10	0.07	0.2	OK
36	7/12/2005	21:44	7/11/2005	12:39	07/12/05	13:44	90300	980	8617	2881	1.20E-02	1.31E+04	3.66	0.06	0.1	OK
39	7/12/2005	21:00	7/11/2005	13:41	07/12/05	13:45	86640	42	6569	2881	1.20E-02	1.97E+05	90.93	1.15	0.7	OK
46	7/13/2005	13:53	7/11/2005	12:31	07/12/05	12:55	87840	1052	13178	2881	1.20E-02	2.20E+04	6.76	0.08	0.2	OK
51	7/12/2005	22:30	7/11/2005	12:08	07/12/05	12:37	88140	48	7249	2881	1.20E-02	2.04E+05	88.13	1.06	0.7	OK
53	7/12/2005	20:53	7/11/2005	13:44	07/12/05	13:47	86580	260	6102	2881	1.20E-02	2.78E+04	12.44	0.19	0.3	OK
55	7/13/2005	14:34	7/11/2005	13:10	07/12/05	13:24	87240	803	7831	2881	1.20E-02	1.38E+04	4.94	0.08	0.2	OK
57	7/12/2005	22:38	7/11/2005	12:55	07/12/05	12:50	86100	844	8129	2881	1.20E-02	1.40E+04	4.38	0.07	0.2	OK
60	7/12/2005	22:12	7/11/2005	13:22	07/12/05	13:32	87000	99	6055	2881	1.20E-02	7.19E+04	34.94	0.48	0.4	OK
72	7/12/2005	19:16	7/11/2005	13:59	07/12/05	14:00	86460	51	5902	2881	1.20E-02	1.33E+05	66.04	0.89	0.6	OK
74	7/12/2005	21:27	7/11/2005	12:21	07/12/05	12:42	87660	451	7750	2881	1.20E-02	2.42E+04	8.74	0.12	0.2	OK
75	7/12/2005	22:00	7/11/2005	12:03	07/12/05	12:34	88260	39	5968	2881	1.20E-02	1.78E+05	88.90	1.18	0.7	OK
80	7/12/2005	19:52	7/11/2005	13:44	07/12/05	13:47	86580	381	7662	2881	1.20E-02	2.82E+04	10.37	0.14	0.2	OK
81	7/12/2005	22:02	7/11/2005	13:35	07/12/05	13:41	86760	275	6745	2881	1.20E-02	3.15E+04	13.16	0.19	0.3	OK
82	7/12/2005	21:42	7/11/2005	13:31	07/12/05	13:39	86880	39	8626	2881	1.20E-02	3.31E+05	129.63	1.42	0.7	OK
92	7/13/2005	14:48	7/11/2005	12:26	07/12/05	12:48	87720	480	6687	2881	1.20E-02	1.78E+04	7.76	0.12	0.2	OK

Reviewed by _____

Table 2-2 **Radon Flux Measurements for HMC Grants Site - STP**

Environmental Restoration Group, Inc.
12809 Arroyo de Vista NE
Albuquerque, NM 87111

Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi)	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
96	7/12/2005	21:37	7/11/2005	12:50	07/12/05	13:11	87660	234	6515	2881	1.20E-02	3.48E+04	15.00	0.21	0.3	OK
97	7/12/2005	20:50	7/11/2005	13:50	07/12/05	13:52	86520	61	5332	2881	1.20E-02	9.02E+04	50.15	0.72	0.6	OK
103	7/12/2005	18:45	7/11/2005	13:03	07/12/05	13:18	87300	641	7077	2881	1.20E-02	1.47E+04	5.00	0.08	0.2	OK
104	7/12/2005	22:58	7/11/2005	12:05	07/12/05	12:36	88260	55	7513	2881	1.20E-02	1.89E+05	79.77	0.94	0.6	OK
105	7/12/2005	18:15	7/11/2005	12:37	07/12/05	13:00	87780	1200	18027	2881	1.20E-02	2.83E+04	7.26	0.07	0.1	OK
107	7/13/2005	14:12	7/11/2005	12:23	07/12/05	12:46	87780	316	6290	2881	1.20E-02	2.42E+04	11.72	0.18	0.3	OK
108	7/13/2005	15:06	7/11/2005	13:12	07/12/05	13:23	87060	1200	7093	2881	1.20E-02	7.88E+03	2.37	0.06	0.1	OK
200	7/12/2005	19:18	7/11/2005	12:13	07/12/05	12:41	88080	110	5536	2881	1.20E-02	5.42E+04	27.75	0.40	0.4	OK
252	7/12/2005	22:34	7/11/2005	13:19	07/12/05	13:34	87300	156	6169	2881	1.20E-02	4.73E+04	22.07	0.31	0.4	OK
256	7/12/2005	19:59	7/11/2005	12:44	07/12/05	13:07	87780	710	8073	2881	1.20E-02	1.64E+04	5.22	0.08	0.2	OK
257	7/12/2005	20:43	7/11/2005	13:55	07/12/05	13:54	86340	81	15216	2881	1.20E-02	3.42E+05	109.49	0.90	0.5	OK
261	7/12/2005	19:42	7/11/2005	12:53	07/12/05	13:12	87540	240	8329	2881	1.20E-02	5.09E+04	18.79	0.23	0.3	OK
261 B	7/12/2005	19:46	7/11/2005	12:53	07/12/05	13:12	87540	212	7247	2881	1.20E-02	4.62E+04	18.50	0.24	0.3	OK
51B	7/12/2005	22:32	7/11/2005	12:08	07/12/05	12:37	88140	64	9366	2881	1.20E-02	2.27E+05	85.37	0.90	0.6	OK
9 B	7/12/2005	21:20	7/11/2005	12:33	07/12/05	12:57	87840	239	6086	2881	1.20E-02	3.01E+04	13.57	0.20	0.3	OK
92B	7/13/2005	14:58	7/11/2005	12:26	07/12/05	12:48	87720	438	6142	2881	1.20E-02	1.67E+04	7.83	0.13	0.2	OK

Reviewed by _____

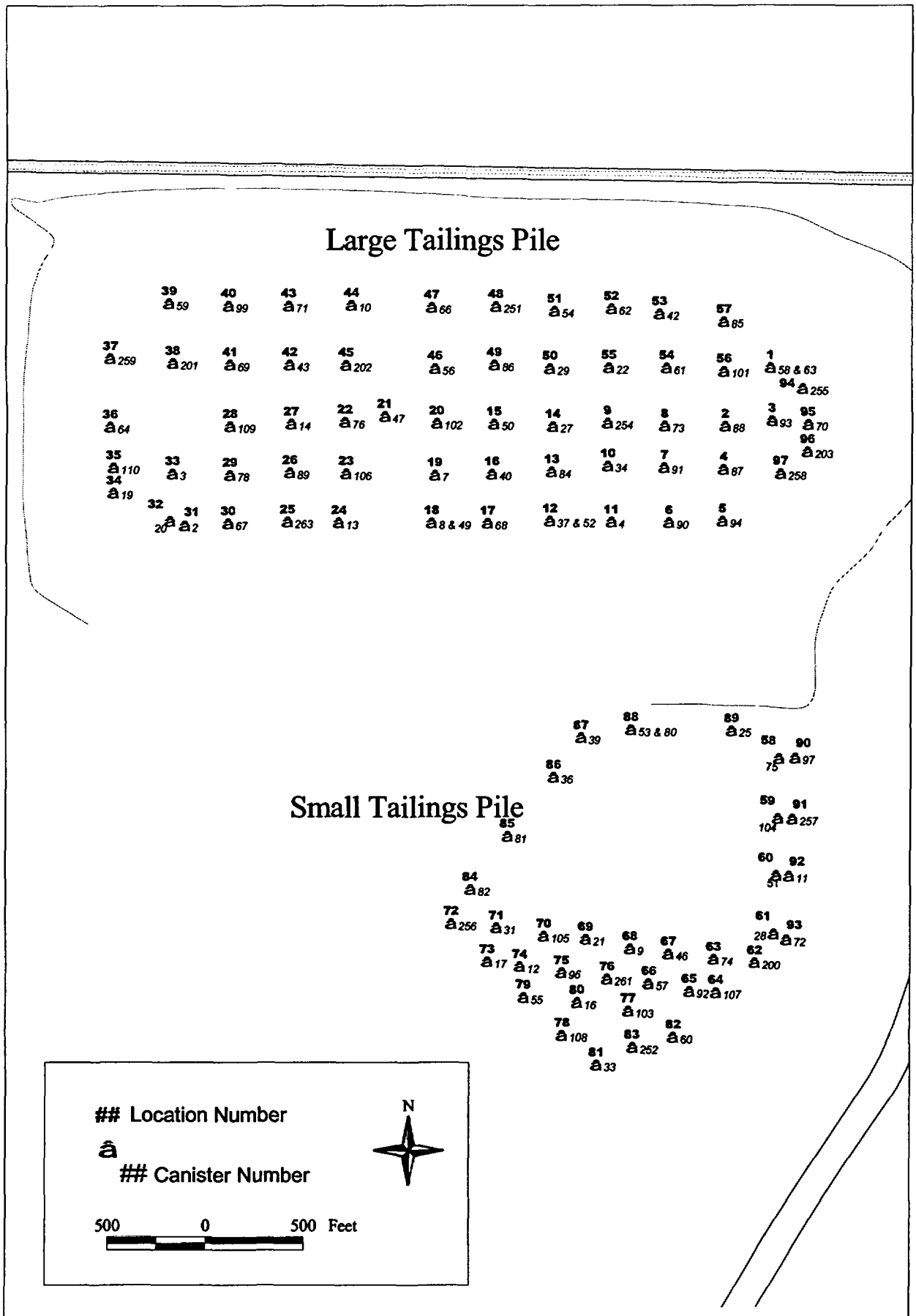

Figure 2-1 Locations of Flux Canisters

favorably to the 20.3 pCi/m^2 measured in 2004 and the 17 pCi/m^{2}s measured in 1994-1995.

The average flux for each pile should be limited to 100 pCi/m^{2}s. An evaporation pond is placed on the STP and therefore that portion of the pile has 0 pCi/m^{2}s flux. The flux values for the waypoints corresponding to the other portions of the pile (Side Slopes and Southern Portion) were averaged and the corresponding areas were used to obtain an area weighted average flux of 8.21 pCi/m^{2}s. The areas for the side slopes, Southern Portion, and Evaporation Pond are 137,000, 874,000, and 1,331,000 square feet, respectively. The corresponding average flux for these areas was 74.0, 10.4, and 0 pCi/m^{2}s, respectively.

The data show that both the large and small tailings average below the 20 pCi/m^{2}s standard in 10 CFR 40 Appendix A.

4. Quality Assurance

The EPA Method 115 requirements were met for the measurements. No rainfall was reported during the 24 hours prior to the measurements. Also the temperature exceeded 35 degrees F.

Two independent sources were used to calibrate the spectrometer, using identical geometry conditions to that of the canisters. Agreement between calibration factors were within five percent of the mean. The results of these measurements are included Table 4-1.

The data shown in Table 4-2 includes the comparative analysis of every 10th canister analyzed. Agreement between measurements were well within ten percent and consistent with state-of-the art gamma spectroscopy results.

Two trip blanks (Canister Nos. 35 and 83) were included in the batch and counted without exposing them to radon. The measured flux of 0.03 and 0.05 pCi/m^{2}s for the canisters is near the expected 0 pCi/m^{2}s value. These results indicate that the canisters had not been exposed, confirming the integrity of the bags.

Four sets of duplicates were placed. Canisters 58 and 63 were placed at Location Number 1. The radon flux results for these two canisters are 1.32 and 1.46 pCi/m^{2}s, respectively. Duplicate canisters 37 and 52 were placed at Waypoint Number 12. The radon flux results for these two canisters are 61.57 and 46.97 pCi/m^{2}s, respectively. Canisters 8 and 49 were placed at Location Number 18. The radon flux results for these two canisters are 77.30 and 53.18 pCi/m^{2}s, respectively. Canisters 53 and 80 were placed at Location Number 80. The radon flux results for these two canisters are 12.44 and 10.37 pCi/m^{2}s, respectively. The agreement is about what can be expected since the canisters were only placed near one another, and weren't true duplicates.

Table 4-1 Quality Assurance Results of Standard Analysis

Standard	Date	Count Time (seconds)	Standard (nCi)	Counts	Average Bkg Counts	Efficiency	Error (1.00 SD)
STD 1A	07/12/05	1200	80	47237	2881	0.0125	6.3001E-05
STD 3	07/12/05	1200	78.83	43283	2881	0.0116	6.1360E-05
STD 1A	07/13/05	1200	80	47543	2881	0.0126	6.3193E-05
STD 3	07/13/05	1200	78.83	43390	2881	0.0116	6.1431E-05
Mean						0.0121	

Table 4-2 Comparison Data of Every Tenth Sample Analyzed

Cannister	First Analysis (A) pCi/m^2s	Second Analysis (B) pCi/m2s	Difference
7	106.2	107.10	0.8%
8	77.3	77.53	0.3%
9	13.51	13.57	0.4%
40	11.64	11.63	0.1%
51	88.13	85.37	3.1%
59	73.65	72.92	1.0%
92	7.76	7.83	0.9%
93	15.64	15.80	1.0%
251	33.88	34.94	3.1%
261	18.79	18.50	1.5%