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HOMESTAKE MINING COMPANY

P.O. BOX 96  
GRANTS, NEW MEXICO  
87020

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40-8903

RETURN ORIGINAL TO [unclear]

March 15, 1989

EXPRESS MAIL: B65638004

Mr. Harry J. Pettengill, Chief  
Licensing Branch 2  
Uranium Recovery Field Office  
U.S. Nuclear Regulatory Commission  
730 Simms Street, Suite 100  
Lakewood, Co 80215

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Re: License No. SUA-1471  
Condition Number 35

Log No.	728 89-3
Remitter	
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Amount	150
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Type of Fee	Amst
Date Check Rec'd.	3/28/89
Date Computed	3/31/89
By:	[Signature]

Dear Mr. Pettengill:

Pursuant to Homestake Mining Company of California's (Homestake) Radioactive Material License (SUA-1471), Condition No. 35, this report is hereby submitted to the U.S. Nuclear Regulatory Commission (NRC). Documented in this report, as attachments, are the results for the monitoring of wells required by Condition No. 35.

Also, pursuant to NRC's letter of November 9, 1988, please find the following proposal to revise Homestake's Source Material License SUA-1471, Condition No. 35 to read as follows:

" 35. The licensee shall implement a ground-water compliance program to ensure compliance with 10CFR Part 40, Appendix A, which includes the following elements:

- A. Determination of the extent and concentration of chromium, molybdenum, natural uranium, selenium, vanadium, thorium-230 and pH, utilizing wells P, Q, R, DD, N, O, SB, DB, B1, PM, JC, Z, E, I, F, FB, WR2, WR5, WR11, BC, BB2, W, 802, AW, 804, 815, 835, 840, 844, 846, SUB3, SUB2, SUB1, 492 and 490. The average of the next two quarterly sample results will be used to define these concentrations. Monitoring of wells outside of Homestake's property will be dependent upon owners cooperation.

8904110203 890315  
PDR ADOCK 04008903  
PDC

DESIGNATED ORIGINAL

Certified By Mary C. Hood

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89-0507

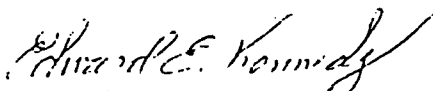
Mr. Harry Pettengill, Chief  
March 15, 1989  
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- B. Submit to the USNRC, Uranium Recovery Field Office, within 200 days of issuance of this amendment, a report delineating the extent and concentration of the hazardous constituents listed in Subsection A, in the regulated unit as well as compliance standards for the hazardous constituents."

If you have any comments or questions concerning any of this material, please do not hesitate to contact me.

Very truly yours,

HOMESTAKE MINING COMPANY



Edward E. Kennedy  
Director of Environmental  
Affairs

EEK/bgl

xc: R.F. Farrell  
M.D. Hiles  
G.L. Hoffman

## HOMESTAKE DETECTION MONITORING

The water quality of the detection monitoring wells DB, DE, DG, SA, SB, SE, DL and SV was compared to the background monitoring wells DD, P, Q and R to determine if the concentrations downgradient of the Homestake tailing facilities significantly exceed those upgradient. The t-test at a 95% confidence level was used to determine significant difference between background and each downgradient detection site. Table 1 presents the tabulated water quality data. Homestake and an outside contract laboratory (Barringer) were used for these analyses. Table 2 presents the results of the t-tests performed. No significant difference was found to exist between the downgradient and background sites for chromium, radium-226 and radium 228, except for a slight exceedance at well DL for chromium. Thorium-230 concentrations at well DL only were found to be significantly greater than the background concentrations. All of the vanadium concentrations, except those at detection wells SA and SE, slightly exceed background.

All of the downgradient sites exceeded the upgradient concentration for molybdenum, uranium and selenium. The pH of the alluvial water at three of the detection monitoring sites is elevated above background.

TABLE 1 - WATER QUALITY DATA

(IN MG/L EXCEPT RA IN PCi/L)

WELL I.D.	DATE	LAB CR	NO	U-NAT	SE	V	RA226 pCi/L	TH230 pCi/L	RA228 pCi/L	PH units	
DB	12/13/88	HMC	<.010	41.1	29.5	1.93	.030	.200	----	8.30	
	12/13/88	BARR	.280	31.0	26.9	2.24	.170	.300	.200	<.001	8.08
	01/17/89	HMC	<.010	45.5	31.0	2.12	.040	----	----	----	7.90
	01/17/89	BARR	.250	33.7	20.8	1.92	.180	.200	.200	<.001	7.63
	02/16/89	HMC	<.010	45.5	34.7	2.41	.030	----	----	----	7.70
DE	02/16/89	BARR	.300	43.1	35.6	1.79	.240	.100	.900	.900	7.70
	12/14/88	HMC	<.010	54.4	35.3	2.80	.040	.200	----	----	8.90
	12/14/88	BARR	.280	43.8	33.4	2.93	.180	.200	1.10	.400	8.60
	01/17/89	HMC	<.010	55.5	35.9	3.00	.040	----	----	----	8.60
	01/17/89	BARR	.200	41.9	25.4	2.41	.170	.100	.600	.400	8.53
DG	02/16/89	HMC	<.010	49.7	33.1	1.76	.030	----	----	----	8.40
	02/16/89	BARR	.230	47.5	33.9	1.80	.240	.200	.300	.300	8.41
	12/13/88	HMC	<.010	32.3	37.3	1.58	.030	.200	----	----	7.70
	12/13/88	BARR	.370	24.5	41.6	1.85	.180	.100	.800	1.20	7.69
	01/17/89	HMC	<.010	31.8	36.7	2.04	.030	----	----	----	7.20
SA	01/17/89	BARR	.280	23.3	35.5	1.44	.016	.100	1.10	<.001	7.37
	02/16/89	HMC	<.010	30.6	35.6	1.22	.016	----	----	----	7.40
	02/16/89	BARR	.310	26.4	35.6	1.45	.170	.100	1.20	.100	7.76
	12/13/88	HMC	<.010	11.2	12.2	.740	.010	1.80	----	----	7.70
	12/13/88	BARR	.180	9.91	15.4	.735	.080	.200	.800	.800	7.99
SB	01/12/89	HMC	<.010	13.5	12.7	.750	.010	----	----	----	7.50
	01/12/89	BARR	.130	10.8	13.7	.545	.050	<.001	<.001	.800	7.55
	02/16/89	HMC	<.010	11.5	11.5	.590	.010	----	----	----	7.70
	02/16/89	BARR	.140	12.0	12.6	.403	.080	.100	.200	.400	7.85
	12/13/88	HMC	<.010	48.2	27.1	.630	.030	.200	----	----	7.90
SE	12/13/88	BARR	.280	38.0	29.0	.522	.140	.200	1.80	.500	7.92
	01/12/89	HMC	<.010	48.4	28.2	.680	.030	----	----	----	8.10
	01/12/89	BARR	.210	37.2	27.6	.514	.130	<.001	.800	.600	7.55
	02/16/89	HMC	<.010	44.8	27.3	.670	.030	----	----	----	7.70
	02/16/89	BARR	.250	42.8	28.8	.392	.150	.100	.300	.600	7.67
DL	12/14/88	HMC	<.010	5.55	5.60	1.38	<.010	.200	----	----	8.30
	12/14/88	BARR	.130	4.72	6.03	1.85	.060	.100	.200	.200	7.85
	01/17/89	HMC	<.010	6.96	5.60	1.43	<.010	----	----	----	8.00
	01/17/89	BARR	.090	5.65	6.41	.820	.130	.200	.200	.700	7.49
	02/16/89	HMC	<.010	5.83	5.09	1.20	<.010	----	----	----	7.50
SV	02/16/89	BARR	.110	5.81	5.77	1.28	.050	.200	.400	.800	7.85
	12/15/88	HMC	<.010	249	159	2.10	.120	.200	----	----	8.40
	12/15/88	BARR	1.13	154	212	1.30	.710	.400	3.00	1.80	8.19
	01/17/89	HMC	<.010	323	195	2.43	.170	----	----	----	8.40
	01/17/89	BARR	.890	147	208	1.44	.680	.200	3.70	.900	8.10
SV	02/16/89	HMC	<.010	202	176	2.71	.100	----	----	----	8.40
	02/16/89	BARR	.920	153	175	1.37	.680	.300	1.70	1.10	8.28
	12/14/88	HMC	<.010	77.9	46.9	3.51	.060	.200	----	----	9.20
	12/14/88	BARR	.340	58.5	53.0	2.70	.380	<.001	.900	<.001	8.85
	01/11/89	HMC	<.010	80.3	48.6	3.36	.080	----	----	----	9.00
SV	01/11/89	BARR	.250	58.2	56.0	2.10	.360	<.001	.700	.200	8.84
	02/15/89	HMC	<.010	70.5	44.5	3.26	.060	----	----	----	9.00
	02/15/89	BARR	.260	60.3	49.2	1.47	.380	.100	.200	.300	8.94

WELL I.D.	DATE	LAB CR	NO	U-NAT	SE	V	RA226 pCi/L	TH230 pCi/L	RA228 pCi/L	PR units	
DD	12/13/88	HMC	<.010	.010	.0933	.020	.200	----	----	7.70	
	12/13/88	BARR	.110	.050	.229	.029	.100	.100	.600	7.90	
	01/11/89	HMC	<.010	.010	.0763	.010	.200	----	----	7.70	
	01/11/89	BARR	.080	.010	.204	.031	.040	<.001	.300	.800	7.42
	02/15/89	HMC	<.010	.010	.150	.010	.020	----	----	----	7.40
	02/15/89	BARR	.100	.020	.245	.037	.030	<.001	.100	.800	7.56
P	12/13/88	HMC	<.010	.020	.0424	.110	.010	.800	----	----	7.70
	12/13/88	BARR	.070	.040	.041	.094	.030	.200	.200	1.20	8.10
	01/11/89	HMC	<.010	.010	.0254	.110	.010	.600	----	----	7.60
	01/11/89	BARR	.040	.020	.0368	.090	.020	.200	.700	1.40	7.66
	02/15/89	HMC	<.010	.010	.042	.090	.010	----	----	----	7.40
	02/15/89	BARR	.060	.060	.0399	.119	.030	.200	<.001	.800	7.72
Q	12/13/88	HMC	<.010	.020	.0594	.200	<.010	.300	----	----	7.70
	12/13/88	BARR	.080	.030	.0454	.215	.040	.300	.200	.900	8.03
	01/11/89	HMC	<.010	.010	.0254	.200	<.010	.200	----	----	7.60
	01/11/89	BARR	.050	.010	.0501	.158	.030	.300	<.001	.600	7.65
	02/15/89	HMC	<.010	.010	.0340	.170	<.010	----	----	----	7.60
	02/15/89	BARR	.070	.010	.0512	.190	.040	.100	.100	.800	7.82
R	12/13/88	HMC	<.010	.020	.0424	.100	.010	.200	----	----	8.20
	12/13/88	BARR	.060	.020	.023	.074	.030	.500	.900	.300	7.97
	01/11/89	HMC	<.010	.010	.017	.090	.010	.200	----	----	7.90
	01/11/89	BARR	.040	.010	.0169	.091	.020	.100	<.001	.600	7.73
	02/15/89	HMC	<.010	.010	.0170	.090	<.010	----	----	----	7.60
	02/15/89	BARR	.060	.010	.0180	.099	.030	<.001	.200	1.00	7.86

TABLE 2. HOMESTAKE DETECTION MONITORING RESULTS.

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CONSTITUENT									
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WELL	-----								
NAME	Cr	Mo	U	Se	V	Ra-226	Ra226+228	Th-230	pH
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DB	*	#	#	#	#	*	*	*	*
DE	*	#	#	#	#	*	*	*	#
DG	*	#	#	#	#	*	*	*	*
SA	*	#	#	#	*	*	*	*	*
SE	*	#	#	#	*	*	*	*	*
DL	#	#	#	#	#	*	*	#	#
SV	*	#	#	#	#	*	*	*	#

NOTES : \* = COMPLIANCE

# = DETECTION CONCENTRATION > BACKGROUND