M/045/004

M/045/004 data in Pine Cyn. final reclam plan.

Kennecott
Utah Copper
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Michael H. Gibson
Director, Environmental Affairs

DOGM
MINERALS PROGRAM
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DEC 11 1989
DIVISION OF
OIL, GAS & MINING

Kennecott

December 7, 1989

Holland Shepherd
Department of Natural Resources
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

Subject: Pine Canyon Water Data

Dear Mr. Shepherd:

Please see the attached water level data as was requested in a letter dated October 29, 1989 from the Division of Oil, Gas and Mining (DOGM). Data includes measurements from the production well (upper shaft) and exhaust shaft (air shaft) as well as flow measurements from the Pine Canyon Tunnel Flow and Big Springs. Water quality data taken September 21, 1988 is available for Carr Fork Wells #1-4 as well as from Pine Canyon Tunnel, and Big Springs taken September 18, 1989.

As was requested, we will maintain a twice monthly measurement on the exhaust shaft and a quarterly measurement on the production well. Water quality will be measured at least once per year from the Production Shaft. This updated information will be submitted at six month intervals, with the first set being submitted in July 1990.

If we can be of any further assistance on this matter, please contact me accordingly.

Very truly yours,

Michael H. Gibson
Director, Environmental Affairs

MHG:bt

Enclosure

cc: Bart Kale w/enc
Fred Snyder w/enc

Pine Canyon Water Level Information

Well	Date Sampled	Static Water Level (feet)
Well #1	10-6-89	39.00
Well #2	10-6-89	104.10
Well #3	10-6-89	115.50
Well #4	11-1-89	154.84
Upper Shaft (Production)	11-16-88	301.34
"	4-25-89	297.25
"	9-18-89	292.90
"	10-6-89	294.30
"	11-1-89	296.30
Air Shaft (Exhaust)	1-6-89	199.70
"	9-18-89	191.60
"	11-1-89	194.30

These flows are STATIC WATER LEVELS (SWL)

The Air Shaft is measured from the collar

The Upper Shaft is measured from the top of the standpipe

Pine Canyon tunnel flow	41 gpm - 10-6-89
Big Springs	274 gpm - 11-1-89

Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
Pine Canyon Tunnel Total Metals	9/18/89	pH		8.17	-
		CONDUCTIVITY		535	H
		Cu	Less than	0.01	L
		Fe		0.21	L
		As		0.004	L
		Mn	Less than	0.01	L
		Zn		0.03	L
		Al		0.14	L
		Mg		35.7	L
		Pb	Less than	0.005	L
		Se	Less than	0.004	L
		Ni		0.01	L
		Ba	Less than	0.01	L
		Cd	Less than	0.01	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg		0.0001	L
		Na		14	L
		Ca		63	L
		K		1.2	L
		Be	Less than	0.005	L
		SO_4		125	L
		Cl		11	L
		NO_3-N	Less than	0.10	L
		NO_2-N	Less than	0.02	L
		TDS		393	L
		TEMP °C		17	-
		Be			-
		Total Coliform		2	MPN
		Fecal Coliform		17	MPN
Pine Canyon Tunnel Dissolved Metals	9/18/89	pH			-
		CONDUCTIVITY			H
		Cu	Less than	0.01	L
		Fe	Less than	0.01	L
		As	Less than	0.004	L
		Mn	Less than	0.01	L
		Zn		0.01	L
		Al		0.09	L
		Mg			L
		Pb	Less than	0.005	L
		Se	Less than	0.004	L
		Ni	Less than	0.01	L
		Ba	Less than	0.01	L
		Cd	Less than	0.01	L

L = mg/liter
H = micromhos/cm
MPN = Most Probable Number

Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		Cr		0.01	L
		Ag		0.01	L
		Hg			L
		Na			L
		Ca			L
		K			L
		Be	Less than	0.005	L
		SO_4			L
		Cl			L
		NO_3-N			L
		NO_2-N			L
		TDS			L
		TEMP °C			-
		Be			-
		Total Coliform			MPN
		Fecal Coliform			MPN
Big Springs	9/18/89	pH		7.65	-
Total Metals		CONDUCTIVITY		580	H
		Cu	Less than	0.01	L
		Fe		0.43	L
		As	Less than	0.004	L
		Mn	Less than	0.01	L
		Zn		0.02	L
		Al		0.06	L
		Mg		31.4	L
		Pb		0.008	L
		Se	Less than	0.004	L
		Ni		0.02	L
		Ba		0.01	L
		Cd	Less than	0.01	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg	Less than	0.0001	L
		Na		24	L
		Ca		57	L
		K		1.5	L
		Be	Less than	0.005	L
		SO_4		109	L
		Cl		39	L
		NO_3-N		1.43	L
		NO_2-N	Less than	0.02	L
		TDS		403	L
		TEMP °C		19	-
		Be			-
		Total Coliform			MPN
		Fecal Coliform			MPN

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Kennecott Utah Copper
MHG 12-7-89

Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
Big Springs Dissolved Metals	9/18/89	pH			-
		CONDUCTIVITY			H
		Cu	Less than	0.01	L
		Fe	Less than	0.01	L
		As	Less than	0.004	L
		Mn	Less than	0.01	L
		Zn		0.02	L
		Al		0.05	L
		Mg			L
		Pb	Less than	0.005	L
		Se	Less than	0.004	L
		Ni	Less than	0.01	L
		Ba		0.01	L
		Cd	Less than	0.01	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Na			L
		Ca			L
		K			L
		Be	Less than	0.005	L
		SO_4			L
		Cl			L
		NO_3-N			L
		NO_2-N			L
		TDS			L
		TEMP °C			-
		Be			-
		Total Coliform			MPN
		Fecal Coliform			MPN
Adamson Tunnel Total Metals	9/18/89	pH		7.58	-
		CONDUCTIVITY		554	-
		Cu	Less than	0.01	L
		Fe		0.41	L
		As	Less than	0.004	L
		Mn		0.01	L
		Zn		0.02	L
		Al	Less than	0.01	L
		Mg		30.6	L
		Pb	Less than	0.005	L
		Se	Less than	0.004	L
		Ni	Less than	0.01	L
		Ba		0.04	L
		Cd	Less than	0.01	L
		Cr		0.01	L
		Ag		0.01	L

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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		Hg		0.0001	L
		Na		24	L
		Ca		53	L
		K		1.5	L
		Be	Less than	0.005	L
		SO_4		90	L
		Cl		29	L
		NO_3-N		1.64	L
		NO_2-N	Less than	0.02	L
		TDS		365	L
		TEMP °C		19	-
		Be			-
		Total Coliform			MPN
		Fecal Coliform			MPN
Adamson Tunnel	9/18/89	pH			-
Dissolved Metals		CONDUCTIVITY			H
		Cu	Less than	0.01	L
		Fe	Less than	0.01	L
		As	Less than	0.004	L
		Mn	Less than	0.01	L
		Zn		0.01	L
		Al	Less than	0.01	L
		Mg			L
		Pb	Less than	0.005	L
		Se	Less than	0.004	L
		Ni		0.02	L
		Ba		0.03	L
		Cd	Less than	0.01	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Na			L
		Ca			L
		K			L
		Be	Less than	0.005	L
		SO_4			L
		Cl			L
		NO_3-N			L
		NO_2-N			L
		TDS			L
		TEMP °C			-
		Be			-
		Total Coliform			MPN
		Fecal Coliform			MPN

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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
Carr Fork Well #1 Total Metals	9/21/88	pH		7.65	-
		TEMP °C		11	-
		CONDUCTIVITY		455	H
		CO_3	Less than	5	L
		HCO_3		203	L
		TDS		409	L
		SO_4		73	L
		Cl		20	L
		Ca		52.	L
		Na		27.3	L
		Mg		26.6	L
		K		1.1	L
		Cu		0.02	L
		Fe		0.58	L
		As		0.008	L
		Mn		0.03	L
		Zn		0.11	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.012	L
		Ni		0.02	L
		Ba		0.08	L
		Cd	Less than	0.005	L
		Cr		0.07	L
		Ag	Less than	0.01	L
		Hg	Less than	0.0001	L
		Be	Less than	0.004	L
		PHOH	Less than	.01	L
		Total Colifm	Less than	1	MPN
		Fecal Colifm	Less than	1	MPN
		NO_3-N		1.4	L
		NO_2-N	Less than	.05	L
Carr Fork Well #1 Dissolved Metals	9/21/88	pH			-
		TEMP °C			-
		CONDUCTIVITY			H
		CO_3			L
		HCO_3			L
		TDS			L
		SO_4			L
		Cl			L
		Ca			L
		Na			L
		Mg			L
		K			L
		Cu		0.02	L

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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		Fe		0.03	L
		As		0.008	L
		Mn		0.02	L
		Zn		0.03	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.012	L
		Ni		0.02	L
		Ba		0.07	L
		Cd	Less than	0.005	L
		Cr		0.03	L
		Ag	Less than	0.01	L
		Hg			L
		Be	Less than	0.004	L
		PHOH			L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N			L
		NO_2-N			L
Carr Fork Well #2 Total Metals	9-21-88	pH		7.5	-
		TEMP °C		11	-
		CONDUCTIVITY		452	H
		CO_3	Less than	5	L
		HCO_3		212	L
		TDS		338	L
		SO_4		74	L
		Cl		16	L
		Ca		49	L
		Na		28.0	L
		Mg		24.7	L
		K		1.4	L
		Cu		0.03	L
		Fe		1.17	L
		As		0.005	L
		Mn		0.04	L
		Zn		0.06	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.006	L
		Ni	Less than	0.01	L
		Ba		0.08	L
		Cd	Less than	0.005	L
		Ag		0.05	L
		Hg	Less than	0.0001	L
		Be	Less than	0.004	L

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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		PHOH	Less than	.01	L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N		1.3	L
		NO_2-N	Less than	.05	L
Carr Fork Well #2 Dissolved Metals	9-21-88	pH			-
		TEMP °C			-
		CONDUCTIVITY			H
		CO_3			L
		HCO_3			L
		TDS			L
		SO_4			L
		Cl			L
		Ca			L
		Na			L
		Mg			L
		K			L
		Cu		0.01	L
		Fe		0.02	L
		As		0.005	L
		Mn		0.04	L
		Zn		0.02	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.004	L
		Ni	Less than	0.01	L
		Ba		0.07	L
		Cd	Less than	0.005	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Be	Less than	0.004	L
		PHOH			L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N			L
		NO_2-N			L
Carr Fork Well #4 Total Metals	9-21-88	pH		7.7	-
		TEMP °C		13	-
		CONDUCTIVITY		471	H
		CO_3	Less than	5	L
		HCO_3		209	L
		TDS		343	L
		SO_4		79	L

L = mg/liter
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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		Cl		21	L
		Ca		54.	L
		Na		27.4	L
		Mg		27.0	L
		K		2.4	L
		Cu		0.03	L
		Fe		0.23	L
		As		0.007	L
		Mn		0.05	L
		Zn		0.10	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.007	L
		Ni		0.01	L
		Ba		0.07	L
		Cd	Less than	0.005	L
		Cr		0.02	L
		Ag	Less than	0.01	L
		Hg	Less than	0.0001	L
		Be	Less than	0.004	L
		PHOH	Less than	.01	L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N		1.4	L
		NO_2-N	Less than	.05	L
Carr Fork Well #4 Dissolved Metals	9-21-88	pH			-
		TEMP °C			-
		CONDUCTIVITY			H
		CO_3			L
		HCO_3			L
		TDS			L
		SO_4			L
		Cl			L
		Ca			L
		Na			L
		Mg			L
		K			L
		Cu		0.01	L
		Fe		0.05	L
		As		0.004	L
		Mn		0.04	L
		Zn		0.07	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se	Less than	0.004	L

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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		Ni	Less than	0.01	L
		Ba		0.05	L
		Cd	Less than	0.005	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Be	Less than	0.004	L
		PHOH			L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N			L
		NO_2-N			L
Big Springs Pond	9-21-88	pH		7.7	-
Total Metals		TEMP °C		14	-
		CONDUCTIVITY		500	H
		CO_3	Less than	5	L
		HCO_3		183	L
		TDS		354	L
		SO_4		90	L
		Cl		31	L
		Ca		57.	L
		Na		21.7	L
		Mg		28.0	L
		K		2.6	L
		Cu		0.03	L
		Fe		0.47	L
		As		0.025	L
		Mn		0.03	L
		Zn		0.05	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.006	L
		Ni		0.01	L
		Ba		0.05	L
		Cd	Less than	0.005	L
		Cr		0.02	L
		Ag		0.01	L
		Hg	Less than	0.0001	L
		Be	Less than	0.004	L
		PHOH	Less than	.01	L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N		1.3	L
		NO_2-N	Less than	.05	L

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Kennecott Utah Copper
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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
Big Springs Pond Dissolved Metals	9-21-88	pH			-
		TEMP °C			-
		CONDUCTIVITY			H
		CO_3			L
		HCO_3			L
		TDS			L
		SO_4			L
		Cl			L
		Ca			L
		Na			L
		Mg			L
		K			L
		Cu		0.01	L
		Fe		0.03	L
		As		0.005	L
		Mn		0.02	L
		Zn		0.01	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.006	L
		Ba		0.07	L
		Cd	Less than	0.005	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Be	Less than	0.004	L
		PHOH			L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N			L
		NO_2-N			L
Adamson Tunnel Total Metals	9-21-88	pH		7.6	-
		TEMP °C		14	-
		CONDUCTIVITY		463	H
		CO_3	Less than	5	L
		HCO_3		212	L
		TDS		337	L
		SO_4		75	L
		Cl		21	L
		Ca		54.	L
		Na		23.0	L
		Mg		28.2	L
		K		2.6	L
		Cu		0.05	L
		Fe		0.09	L

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Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		As		0.006	L
		Mn		0.04	L
		Zn		0.05	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.007	L
		Ni		0.02	L
		Ba		0.07	L
		Cd	Less than	0.005	L
		Cr		0.02	L
		Ag	Less than	0.01	L
		Hg	Less than	0.0001	L
		Be	Less than	0.004	L
		PHOH	Less than	.01	L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N		1.4	L
		NO_2-N	Less than	.05	L
Adamson Tunnel Dissolved Metals	9-21-88	pH			-
		TEMP °C			-
		CONDUCTIVITY			H
		CO_3			L
		HCO_3			L
		TDS			L
		SO_4			L
		Cl			L
		Ca			L
		Na			L
		Mg			L
		K			L
		Cu		0.01	L
		Fe	Less than	0.01	L
		As		0.006	L
		Mn		0.04	L
		Zn		0.01	L
		Al	Less than	0.1	L
		Pb	Less than	0.005	L
		Se		0.007	L
		Ni	Less than	0.01	L
		Ba		0.03	L
		Cd	Less than	0.005	L
		Cr		0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Be	Less than	0.004	L

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Kennecott Utah Copper
MHG 12-7-89

Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		PHOH			L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N			L
		NO_2-N			L
Pine Canyon	9-21-88	pH		8.4	-
Tunnel		TEMP °C		13	-
Total Metals		CONDUCTIVITY		484	H
		CO_3		5	L
		HCO_3		194	L
		TDS		373	L
		SO_4		118	L
		Cl	Less than	10	L
		Ca		65.	L
		Na		17.7	L
		Mg		32.7	L
		K		2.3	L
		Cu		1.13	L
		Fe		0.42	L
		As		1.23	L
		Mn		0.03	L
		Zn		0.23	L
		Al		0.1	L
		Pb		0.249	L
		Se		0.008	L
		Ni	Less than	0.01	L
		Ba		0.02	L
		Cd		0.015	L
		Hg	Less than	0.0001	L
		Be	Less than	0.004	L
		PHOH	Less than	.01	L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N	Less than	.2	L
		NO_2-N	Less than	.05	L
Pine Canyon	9-21-88	pH			-
Tunnel		TEMP °C			-
Dissolved Metals		CONDUCTIVITY			L
		CO_3			L
		HCO_3			L
		TDS			L
		SO_4			L
		Cl			L
		Ca			L

L = mg/liter
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Kennecott Utah Copper
MHG 12-7-89

Description	Sample Date	Parameter	Detectable Limit	Analysis	Unit
		Na			L
		Mg			L
		K			L
		Cu		0.01	L
		Fe		0.03	L
		As		0.011	L
		Mn		0.02	L
		Zn		0.01	L
		Al		0.1	L
		Pb	Less than	0.005	L
		Se		0.006	L
		Ni	Less than	0.01	L
		Ba		0.02	L
		Cd	Less than	0.005	L
		Cr	Less than	0.01	L
		Ag	Less than	0.01	L
		Hg			L
		Be	Less than	0.004	L
		PHOH			L
		Total Coliform			MPN
		Fecal Coliform			MPN
		NO_3-N			L
		NO_2-N			L

L = mg/liter
H = micromhos/cm
MPN = Most Probable Number

Kennecott Utah Copper
MHG 12-7-89