5W-5

1930513 - R8 SEMS

Business Phone 605-341-7284
Hours 8:00 — 5:00 — M-F

twin city testing corporation

COAL — ORES — ENVIRONMENTAL WATERS — FEEDS — SOILS

1854 Lombardy Dr
Rapid City, South Dakota 57701

Job # 6110-89-13

JAMES H. TRAVIS
Laboratory Manager

REPORT DATE: 10/5/89

COMPANY: Brohm Mining Co. Scott Wanstedt

ADDRESS: PO Box 485

CITY-STATE: Deadwood, S.D. 57732

SAMPLE #: SW 5

SAMPLE DATE-TIME: 8/30/89

DATE RECEIVED: 8/31/89

LABORATORY #: 4813

PARAMETER -- Minerals	RESULT
Alkalinity (CaCO3), mg/l	111
Bicarbonate (HCO3), mg/l	135
Carbonate (CO3), mg/l	0
Chloride (C1), mg/l	
Fluoride (F), mg/l	
Sulfate (SO4), mg/l	74
Calcium (Ca), mg/l	
Magnesium (Mg), mg/l	
Potassium (K), mg/l	
Sodium (Na), mg/l	5
Major Anions, MEQ/L	
Major Cations, MEQ/L	
Cation - Anion Balance, %	
PARAMETER -- MISCELLANEOUS	
pH, Units	7.91
Conductivity, umhos/cm	355
Cyanide, Total, mg/l	<0.01
Cyanide, WAD, mg/l	
Cyanide, Free, mg/l	
Hardness (CaCO3), GPG: mg/l	
Oil & Grease, mg/l	
Solids, Dissolved, mg/l	260
Solids, Suspended, mg/l	1
Turbidity, NTU	

REVIEWED BY

METALS:
Tot X Tot Rec ___ Diss ___ EP Tox ___

Antimony (Sb), mg/l	
Aluminum (A1), mg/l	
Arsenic (As), mg/l	<0.005
Barium (Ba), mg/l	
Beryllium (Be), mg/l	
Boron (B), mg/l	
Cadmium (Cd), mg/l	<0.0005
Chromium (Cr), mg/l	
Cobalt (Co), mg/l	
Copper (Cu), mg/l	0.006
Gold (Au), mg/l	
Iron (Fe), mg/l	
Lead (Pb), mg/l	
Lithium (Li), mg/l	
Manganese (Mn), mg/l	
Mercury (Hg), mg/l	
Molybdenum (Mo), mg/l	
Nickel (Ni), mg/l	
Selenium (Se), mg/l	0.003
Silicon (Si), mg/l	
Silver (Ag), mg/l	
Strontium (Sr), mg/l	
Vanadium (V), mg/l	
Zinc (Zn), mg/l	0.06
PARAMETER --Nutrients	
Nitrogen, Ammonia, mg/l	
Nitrogen, Nitrate, mg/l	<0.10
Nitrogen, Nitrite, mg/l	
Nitrogen, Total Kjeldahl, mg/l	
Phosphorus, Ortho, mg/l	
Phosphorus, Total, mg/l	

RECEIVED
OCT 1 1989
BROHM MINING CO.

twin city testing corporation

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REPORT DATE: 10/5/89

COMPANY: Brohm Mining Co. Scott Wanstedt

ADDRESS: PO Box 485

CITY-STATE: Deadwood, S.D. 57732

SAMPLE #: SW 5

SAMPLE DATE-TIME: 8/30/89

DATE RECEIVED: 8/31/89

LABORATORY #: 4814

	PARAMETER -- Minerals	RESULT
	Alkalinity (CaCO3), mg/l	
	Bicarbonate (HCO3), mg/l	
	Carbonate (CO3), mg/l	
	Chloride (C1), mg/l	
	Fluoride (F), mg/l	
	Sulfate (SO4), mg/l	
	Calcium (Ca), mg/l	
	Magnesium (Mg), mg/l	
	Potassium (K), mg/l	
	Sodium (Na), mg/l	
	Major Anions, MEQ/L	
	Major Cations, MEQ/L	
	Cation - Anion Balance, %	
	PARAMETER -- MISCELLANEOUS	
	pH, Units	
	Conductivity, umhos/cm	
	Cyanide, Total, mg/l	
	Cyanide, WAD, mg/l	
	Cyanide, Free, mg/l	
	Hardness (CaCO3), GPG: mg/l	
	Oil & Grease, mg/l	
	Solids, Dissolved, mg/l	
	Solids, Suspended, mg/l	
	Turbidity, NTU	
	REVIEWED BY J. H. Travis	

METALS:

Tot ___ Tot Rec ___ Diss X EP Tox ___

	Antimony (Sb), mg/l	
	Aluminum (A1), mg/l	
	Arsenic (As), mg/l	<0.005
	Barium (Ba), mg/l	
	Beryllium (Be), mg/l	
	Boron (B), mg/l	
	Cadmium (Cd), mg/l	<0.0005
	Chromium (Cr), mg/l	
	Cobalt (Co), mg/l	
	Copper (Cu), mg/l	<0.005
	Gold (Au), mg/l	
	Iron (Fe), mg/l	
	Lead (Pb), mg/l	
	Lithium (Li), mg/l	
	Manganese (Mn), mg/l	
	Mercury (Hg), mg/l	
	Molybdenum (Mo), mg/l	
	Nickel (Ni), mg/l	
	Selenium (Se), mg/l	<0.002
	Silicon (Si), mg/l	
	Silver (Ag), mg/l	
	Strontium (Sr), mg/l	
	Vanadium (V), mg/l	
	Zinc (Zn), mg/l	0.03
	PARAMETER --Nutrients	
	Nitrogen, Ammonia, mg/l	
	Nitrogen, Nitrate, mg/l	
	Nitrogen, Nitrite, mg/l	
	Nitrogen, Total Kjeldahl, mg/l	
	Phosphorus, Ortho, mg/l	
	Phosphorus, Total, mg/l	

RECEIVED
OCT 1 1989
BROHM MINING CO.

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 01 / 24 / 89

Time 13:50

Sampler SW
(Initials)

Sampling Station Number..... SW-5

Temperature (degrees C)..... -.1

pH..... 7.91

Conductivity (umhos/cm)..... 305

Flow (gpm)..... iced up

Water Sample (Yes/No)..... Yes

Filtered Metals (Yes/No)..... Yes

Number/Type Bottles..... 5 (CN)

Comments.....

unable to get accurate flow measurement
do to ice over creek

staff gauge @ .70

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 4 / 29 / 89

Time 10:20

Sampler SW
(Initials)

Sampling Station Number..... SW-5

Temperature (degrees C)..... -.2

pH..... 7.42

Conductivity (umhos/cm)..... 230

Flow (gpm)..see data sheet..... 3779

Water Sample (Yes/No)..... (Yes)

Filtered Metals (Yes/No)..... (Yes)

Number/Type Bottles..... 4 short lids (CN)

Comments.....

snow in creek may be diluting sample

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 4/29/89

Sampler: SW

Station No.: SW-5

Gauge Height: 1.0

Meter Used: pygmy

Stream Width: 13'

Total Flow: 3779 gpm - 8.42 cfs

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
3.0-4.0	3.5	1'	.32		.6	.19
4.0-5.0	4.5	1	.55		.6	.33
5.0-6.0	5.5	1	.69		.8	.55
6.0-7.0	6.5		.60		1.0	.60
7.0-8.0	7.5		.85		1.1	.94
8.0-9.0	8.5		.89		1.1	.98
9.0-10.0	9.5		.87		1.7	1.48
10.0-11.0	10.5		.65		1.6	1.04
11 12	11.5		.72		1.5	1.08
12 13	12.5		.40		1.4	.56
13 14	13.5		.30		1.0	.30
14 15	14.5		.32		.8	.26
15-16	15.5	1.0	.28		.4	.11
					TOTAL	8.42

Comments: heavy snow in stream affecting flow

3779 gpm

~~GROUND~~-WATER SAMPLING FORM
Surface

FIELD MEASUREMENTS

Date 5 / 31 /8 9

Time 9:50

Sampler SW
(Initials)

Sampling Station Number..... SW-5

Temperature (degrees C)..... 12.5

pH..... 7.72

Conductivity (umhos/cm)..... 207

Depth to Water (ft).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles..... 4 (CN [illegible])

Comments.....

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 6/1/89

Sampler: SW

Station No.: SW-5

Gauge Height: .86

Meter Used: ~~Pygmy~~ ~~SW~~

Stream Width: ~~10.0~~ 9.0

Total Flow: 2079 gpm

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
2.5-3.5	3	1	.54	.54	.3	.162
3.5-4.5	4	1	.68		.5	.34
4.5-5.5	5		.84		.7	.588
5.5-6.5	6		.80		.8	.64
6.5-7.5	7		.86		1.0	.86
7.5-8.5	8		.80		1.0	.8
8.5-9.5	9		.77		.8	.616
9.5-10.5	10	1	.65		.7	.455
10.5-11.5	11	1	.57		.3	.171
					TOTAL	4.632

Comments:

2078.8 gpm

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 8 / 30 / 89

Time 10:45

Sampler MA
(Initials)

Sampling Station Number..... SW-8

Temperature (degrees C)..... 16.0

pH..... 7.47

Conductivity (umhos/cm)..... 281

Flow (gpm)..... ~~355 gpm~~ 326.2 gpm SW

Water Sample (Yes/No)..... Yes

Filtered Metals (Yes/No)..... No

Number/Type Bottles.....

Comments.....

staff .30

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 9-1-89 10:45

Sampler: MA

Station No.: SW-8

Gauge Height: ~~.9~~ .30

Meter Used: Pygmy

Stream Width: 5.2'

Total Flow: ~~355 gpm~~ 326.2 gpm SW

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
0	~~.3~~	.5				
.5	.3	.5	.18	.09	.20	.018
1.0	.8	.5	.22	.11	.50	.055
1.5	1.3	.5	.30	.15	1.3	.195
2.0	1.8	.5	.22	.11	.9	.099
2.5	2.3	.5	.31	.155	.4	.062
3.0	2.8	.5	.15	.075	.5	.0375
3.5	3.3	.5	.23	.115	.6	.069
4.0	3.8	.5	.23	.115	.6	.069
4.5	4.3	.5	.17	.085	.6	.051
5.0	~~4~~.8	.5	.20	.10	.7	.07
5.2	5.1	~~.5~~ .2	.07	.014	.1	.0014
					TOTAL	.7269

Comments:

~~355.3~~ gpm

326.2 gpm

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 8 / 30 / 89

Time 11:45

Sampler MA
(Initials)

Sampling Station Number..... SW-5

Temperature (degrees C)..... 17.3

pH..... 7.44

Conductivity (umhos/cm)..... 354

Flow (gpm)..... ~~453 gpm~~ 415.5 gpm SW

Water Sample (Yes/No)..... Yes

Filtered Metals (Yes/No)..... Yes

Number/Type Bottles..... 4

Comments.....

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 9-1-89 12:15

Sampler: MA.

Station No.: SW-5

Gauge Height: .59

Meter Used: ~~Dymy~~

Stream Width: 9.3

Total Flow: 415.5 gpm

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
0						
1.0	.5	1.0	.34	.34	.1	.034
2.0	1.5	1	.37	.37	.3	.111
3.0	2.5	1	.39	.39	.3	.117
4.0	3.5	1	.48	.48	.2	.096
5.0	4.5	1	.47	.47	.4	.188
6.0	5.5	1	.48	.48	.4	.192
7.0	6.5	1	.40	.40	.3	.120
8.0	7.5	1	.16	.16	.3	.048
9.0	8.5	1.0	.09	.09	.2	.018
9.3	9.15	.3	.06	.018	.1	.0018
					TOTAL	.9258

Comments:

~~452.5~~ gpm

415.5

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 2-25-90

Meter Used: Pygmy

Sampler: Md.

Stream Width: 9'

Station No.: Sw-5

Total Flow: 2.96

Gauge Height: _____

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
0-1	.5	1	.4	.4	.4	.16
1-2	1.5	1	.7	.7	1	.7
2-3	2.5	1	.85	.85	0	0
3-4	3.5	1	.8	.8	0	0
4-5	4.5	1	.9	.9	.4	.36
5-6	5.5	1	.9	.9	.3	.27
6-7	6.5	1	.95	.95	.6	.57
7-8	7.5	1	.9	.9	.5	.45
8-9	8.5	1	.75	.75	.6	.45
					TOTAL	2.96

Comments: _____

GROUND-WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 4 / 17 / 90

Time 13:25

Sampler MA MB MK
(Initials)

Sampling Station Number..... SW-5

Temperature (degrees C).....

pH..... 7.60

Conductivity (umhos/cm)..... 138

Depth to Water (ft).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles..... CN MIN Tot Diss NITR

Comments.....

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 5-7-90

Meter Used: Pygmy

Sampler: mt.

Stream Width: 19.5

Station No.: SW-5

Total Flow: 19.805

Gauge Height: _____

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
0-1	.5	1	.45	.45	0	0
1-2	1.5	1	.4	.4	0	0
2-3	2.5	1	.35	.35	0	0
3-4	3.5	1	.27	.27	0	0
4-5	4.5	1	.4	.4	.3	.12
5-6	5.5	1	.5	.5	1	.5
6-7	6.5	1	.6	.6	1.1	.66
7-8	7.5	1	.65	.65	1.1	.715
8-9	8.5	1	.7	.7	1.2	.84
9-10	9.5	1	.9	.9	1.3	1.17
10-11	10.5	1	1	1	1.5	1.5
11-12	11.5	1	1.1	1.1	1.1	1.21
12-13	12.5	1	1.1	1.1	2	2.2
13-14	13.5	1	1.1	1.1	2.8	3.08
14-15	14.5	1	1	1	2.7	2.7
15-16	15.5	1	1.1	1.1	1.8	1.98
16-17	16.5	1	.9	.9	1.9	1.62
17-18	17.5	1	1	1	.5	.5
18-19	18.5	1	1	1	.8	.8
19-19.5	19.25	.5	.7	.35	.6	.21
					TOTAL	19.805

Comments: day after a good rain

GROUND-WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 6 / 4 / 19 90

Time _____

Sampler MT
(Initials)

Sampling Station Number..... SW-S

Temperature (degrees C)..... 23

pH..... 7.3

Conductivity (umhos/cm)..... 215

Depth to Water (ft)..... _____

Water Sample (Yes/No)..... _____

Filtered Metals (Yes/No)..... _____

Number/Type Bottles..... _____

Comments..... _____

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 6-4-90

Meter Used: Pygmy

Sampler: mt.

Stream Width: 12'

Station No.: SW-5

Total Flow: 5.635

Gauge Height: _____

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
0-1	.5	1	.3	.3	.3	.09
1-2	1.5	1	.3	.3	.6	.18
2-3	2.5	1	.5	.5	1.1	.55
3-4	3.5	1	.5	.5	1.3	.65
4-5	4.5	1	.65	.65	.5	.325
5-6	5.5	1	.7	.7	.8	.56
6-7	6.5	1	.65	.65	1.1	.715
7-8	7.5	1	.65	.65	1.3	.845
8-9	8.5	1	.6	.6	.8	.48
9-10	9.5	1	.7	.7	1.1	.77
10-11	10.5	1	.65	.65	.6	.39
11-12	11.5	1	.4	.4	.2	.08
					TOTAL	5.635

Comments: _____

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 8 / 29 / 98

Time 2:05

Sampler MA
(Initials)

Sampling Station Number..... SW-5

Temperature (degrees C)..... 25

pH..... 7.64

Conductivity (umhos/cm)..... 284

Flow (gpm).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No)..... N

Number/Type Bottles..... CN MN DISS TOTAL

Comments.....

Mixt Return

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 8-29-90

Sampler: mt.

Station No.: SW-5

Gauge Height:

Meter Used: Pygmy

Stream Width: 8'

Total Flow: 9.1

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)		Qcfs
0 - .5	.25	.5	3.5	.175 1.75	.1	.075 .075	.175
.5 - 1	.75	.5	3.5	1.75	0		~~0~~
1 - 1.5	1.25	.5	3.5	1.75	.2	.035	.35
1.5 - 2	1.75	.5	3.5	1.75	.4	.07	.7
2 - 2.5	2.25	.5	3.5	1.75	.5	.0875	.875
2.5 - 3	2.75	.5	3.75	1.875	.2	.0375	.375
3 - 3.5	3.25	.5	3.5	1.75	.6	.105	1.05
3.5 - 4	3.75	.5	3.5	1.75	.2	.035	.35
4 - 4.5	4.25	.5	4	2	.7	.140	1.4
4.5 - 5	4.75	.5	3	1.5	.5	.075	.75
5 - 5.5	5.25	.5	3.5	1.75	.5	.0875	.875
5.5 - 6	5.75	.5	3.5	1.75	.3	.0525	.525
6 - 6.5	6.25	.5	2.5	1.25	.3	.0375	.375
6.5 - 7	6.75	.5	2.75	1.375	.4	.055	.55
7 - 7.5	7.25	.5	3	1.5	.1	.075	.75
7.5 - 8	7.75	.5	1.75	.875	~~0~~		~~0~~
		~~.5~~					
						TOTAL	9.1

Comments:

.91

408 gpm

O.K.

need to convert to feet

.35'

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-5
SAMPLE DATE: 04/17/90
SAMPLE TIME:

LAB NUMBER: 19900418103
REPORT DATE: 04/20/90

MARTY TALLEY
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	179.
Hardness	.
PH	6.45
Solids, Dissolved, mg/l	109.
Solids, Suspended, mg/l	95.
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	44.
Bicarbonate	53.7
Carbonate, mg/l	0.
Chloride, mg/l	5.0
Cyanide, Total, mg/l	<.0006
Cyanide, WAD, mg/l	.0013
Cyanide, Free, mg/l	<.005
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	30.

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	.001	.004
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.001	.002
Calcium	22.1	.
Chromium	.	.
Cobalt	.	.
Copper	.017	.034
Gold	<.001	<.001
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	7.07	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	1.50	.
Selenium	.003	.003
Silicon	.	.
Silver	.	.
Sodium	3.23	.
Strontium	.	.
Vanadium	.	.
Zinc	<.005	.109

Dean Durand
4/20/90

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-5
SAMPLE DATE: 04/17/90
SAMPLE TIME:

LAB NUMBER: 19900418103
REPORT DATE: 04/20/90

MARTY TALLEY
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	179.
Hardness	.
PH	6.45
Solids, Dissolved, mg/l	109.
Solids, Suspended, mg/l	95.
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	44.
Bicarbonate	53.7
Carbonate, mg/l	0.
Chloride, mg/l	5.0
Cyanide, Total, mg/l	<.0006
Cyanide, WAD, mg/l	.0013
Cyanide, Free, mg/l	<.005
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	30.

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	.001	.004
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.001	.002
Calcium	22.1	.
Chromium	.	.
Cobalt	.	.
Copper	.017	.034
Gold	<.001	<.001
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	7.07	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	1.50	.
Selenium	.003	.003
Silicon	.	.
Silver	.	.
Sodium	3.23	.
Strontium	.	.
Vanadium	.	.
Zinc	<.005	.109

Dean Amand
4/20/90

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-5
SAMPLE DATE: 06/04/90
SAMPLE TIME:

LAB NUMBER: 19900605103
REPORT DATE: 06/07/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	215.
Hardness	.
PH	7.65
Solids, Dissolved, mg/l	145.
Solids, Suspended, mg/l	2.0
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	58.0
Bicarbonate	70.8
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	<.010
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	22.2

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	.009
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	.001
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.005	.023
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	.001	.001
Silicon	.	.
Silver	.	.
Sodium	4.98	.
Strontium	.	.
Vanadium	.	.
Zinc	.005	.048

Mary McDougall 06-07-90

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-5
SAMPLE DATE: 06/04/90
SAMPLE TIME:

LAB NUMBER: 19900605103
REPORT DATE: 06/07/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	215.
Hardness	.
PH	7.65
Solids, Dissolved, mg/l	145.
Solids, Suspended, mg/l	2.0
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	58.0
Bicarbonate	70.8
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	<.010
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	22.2

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	.009
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	.001
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.005	.023
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	.001	.001
Silicon	.	.
Silver	.	.
Sodium	4.98	.
Strontium	.	.
Vanadium	.	.
Zinc	.005	.048

Alex McDougall 06-07-90

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-5
DESCRITPION:
SAMPLE DATE: 08/29/90
SAMPLE TIME:

ACCOUNT NUMBER: W1000
LAB NUMBER: 19900831111
REPORT DATE: 08/31/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	280.
Hardness	.
PH	7.64
Solids, Dissolved, mg/l	183.
Solids, Suspended, mg/l	1.00
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	106.
Bicarbonate	129.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	<.010
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	35.0

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	.001	.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.005	.004
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.009	.010
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	4.17	.
Strontium	.	.
Vanadium	.	.
Zinc	.032	.034

Amy McDougall
08-31-90

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-5
DESCRITPION:
SAMPLE DATE: 08/29/90
SAMPLE TIME:

ACCOUNT NUMBER: W1000
LAB NUMBER: 19900831111
REPORT DATE: 08/31/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	280.
Hardness	.
PH	7.64
Solids, Dissolved, mg/l	183.
Solids, Suspended, mg/l	1.00
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	106.
Bicarbonate	129.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	<.010
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	35.0

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	.001	.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.005	.004
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.009	.010
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	4.17	.
Strontium	.	.
Vanadium	.	.
Zinc	.032	.034

Amy M. Powell
08-31-90