0009

SOLDIER CREEK COAL CO.

Telephone (801) 637-6360

P.O. Box I
Price, Utah 84501

July 26, 1988

RECEIVED
JUL 28 1988
DIVISION OF
OIL, GAS & MINING

Mr. Lowell P. Braxton, Administrator
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RE: Water Monitoring Results
Second Quarter - 1988
Soldier Creek Coal Company
ACT/007/018 and ACT/007/034

Dear Mr. Braxton:

I have enclosed the results of our water monitoring program for the second quarter of 1988. Please note, that during this quarter a new in-mine ground water monitoring point, UG-10E was established (see enclosed location map and summarized results). Monitoring of this point shall continue in accordance with our approved Mining and Reclamation Plan.

The ground water inflow at UG-10E was first encountered by mining operations on April 11, 1988. No unusual geologic conditions were identified in this area. Large quantities of methane were also encountered, indefinitely suspending mining operations in this area.

Please contact me if you have any questions or comments concerning this information.

Sincerely,

SOLDIER CREEK COAL COMPANY

Dave Spillman

David G. Spillman
Mine Engineer

DGS/lss
Enclosures

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: G-1 (Upper Soldier Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/26/88	05/19/88		

Field Measurements

Flow, gpm	N/A	431
pH, units	8.80	9.02
Conductivity, us/cm	849	744
Temperature, Water°F	34.8	68.8
Temperature, Air °F	50.0	63.0
Dissolved Oxygen, ppm	6.5	6.0

Laboratory Analyses, mg/l

Total Dissolved Solids	524	414
Total Suspended Solids	828	188
Total Settleable Solids/hr	1.3	-0.1
Total Hardness	267	284
Carbonate (CO_3^{-2})	0	0
Bicarbonate (HCO_3-)	388	308
Calcium (Ca)	41	43
Chloride (Cl-)	16	11
Iron-Dissolved (Fe)	0.02	0.08
Magnesium (Mg)	40	43
Manganese (Mn)	-0.01	0.01
Potassium (k)	1	2
Sodium (Na)	110	56
Sulfate (SO_4^{-2})	60	86
Oil & Grease	-1	-1
Cations meq/l	10.20	8.19
Anions meq/l	9.47	8.27
Cation/Anion Balance (%)	3.71	-0.49

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: G-2 (Upper Pine Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/19/88		

Field Measurements

Flow, gpm	871
pH, units	8.70
Conductivity, us/cm	526
Temperature, Water°F	48
Temperature, Air °F	62
Dissolved Oxygen, ppm	5.2

Laboratory Analyses, mg/l

Total Dissolved Solids	276
Total Suspended Solids	94
Total Settleable Solids/hr	-0.1
Total Hardness	282
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	258
Calcium (Ca)	67
Chloride (Cl-)	2
Iron-Dissolved (Fe)	0.06
Magnesium (Mg)	28
Manganese (Mn)	0.01
Potassium (k)	1
Sodium (Na)	12
Sulfate (SO_4^{-2})	19
Oil & Grease	-1
Cations meq/l	6.20
Anions meq/l	5.61
Cation/Anion Balance (%)	5.00

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: G-5 (Lower Soldier Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/26/88	05/20/88		
Field Measurements				
Flow, gpm	N/A	3,586		
pH, units	8.75	8.86		
Conductivity, us/cm	1429	702		
Temperature, Water°F	46.6	43.5		
Temperature, Air °F	50.0	43		
Dissolved Oxygen, ppm	8.1	9.2		
Laboratory Analyses, mg/l				
Total Dissolved Solids	826	364		
Total Suspended Solids	118	70		
Total Settleable Solids/hr	-0.2	-0.2		
Total Hardness	295	275		
Carbonate (CO_3^{-2})	0	0		
Bicarbonate (HCO_3-)	412	288		
Calcium (Ca)	36	46		
Chloride (Cl-)	148	16		
Iron-Dissolved (Fe)	0.07	0.04		
Magnesium (Mg)	50	39		
Manganese (Mn)	0.01	0.01		
Potassium (k)	9	3		
Sodium (Na)	218	46		
Sulfate (SO_4^{-2})	117	62		
Oil & Grease	-1	-1		
Cations meq/l	15.73	7.60		
Anions meq/l	14.84	7.51		
Cation/Anion Balance (%)	2.91	0.60		

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #3

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		

Field Measurements

Flow, gpm	No Flow
pH, units	
Conductivity, us/cm	
Temperature, Water°F	
Temperature, Air °F	

Laboratory Analyses, mg/l

Total Dissolved Solids
Total Hardness
Carbonate (CO_3^{-2})
Bicarbonate (HCO_3-)
Calcium (Ca)
Chloride (Cl-)
Iron-Dissolved (Fe)
Magnesium (Mg)
Manganese (Mn)
Potassium (k)
Sodium (Na)
Sulfate (SO_4^{-2})
Cations meq/l
Anions meq/l
Cation/Anion Balance (%)

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #4

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		

Field Measurements

Flow, gpm	15.0
pH, units	8.97
Conductivity, us/cm	522
Temperature, Water°F	43.1
Temperature, Air °F	42.0

Laboratory Analyses, mg/l

Total Dissolved Solids	258
Total Hardness	234
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	229
Calcium (Ca)	41
Chloride (Cl-)	3
Iron-Dissolved (Fe)	0.04
Magnesium (Mg)	32
Manganese (Mn)	0.01
Potassium (k)	1
Sodium (Na)	17
Sulfate (SO_4^{-2})	16
Cations meq/l	5.45
Anions meq/l	5.00
Cation/Anion Balance (%)	4.31

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #5

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/20/88		

Field Measurements

Flow, gpm	265.0
pH, units	8.80
Conductivity, us/cm	578
Temperature, Water°F	54.0
Temperature, Air °F	59.0

Laboratory Analyses, mg/l

Total Dissolved Solids	308
Total Hardness	299
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	260
Calcium (Ca)	67
Chloride (Cl-)	6
Iron-Dissolved (Fe)	-0.02
Magnesium (Mg)	32
Manganese (Mn)	0.01
Potassium (k)	1
Sodium (Na)	15
Sulfate (SO_4^{-2})	35
Cations meq/l	6.66
Anions meq/l	6.10
Cation/Anion Balance (%)	4.39

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #8

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		

Field Measurements

Flow, gpm	18.3
pH, units	9.17
Conductivity, us/cm	570
Temperature, Water°F	45.0
Temperature, Air °F	43.0

Laboratory Analyses, mg/l

Total Dissolved Solids	322
Total Hardness	241
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	265
Calcium (Ca)	34
Chloride (Cl-)	4
Iron-Dissolved (Fe)	-0.02
Magnesium (Mg)	38
Manganese (Mn)	-0.01
Potassium (k)	1
Sodium (Na)	33
Sulfate (SO_4^{-2})	25
Cations meq/l	6.29
Anions meq/l	5.94
Cation/Anion Balance (%)	2.86

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #10

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		
Field Measurements				
Flow, gpm		No Flow		
pH, units				
Conductivity, us/cm				
Temperature, Water°F				
Temperature, Air °F				
Laboratory Analyses, mg/l				
Total Dissolved Solids				
Total Hardness				
Carbonate (CO_3^{-2})				
Bicarbonate (HCO_3-)				
Calcium (Ca)				
Chloride (Cl-)				
Iron-Dissolved (Fe)				
Magnesium (Mg)				
Manganese (Mn)				
Potassium (k)				
Sodium (Na)				
Sulfate (SO_4^{-2})				
Cations meq/l				
Anions meq/l				
Cation/Anion Balance (%)				

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #15

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		

Field Measurements

Flow, gpm	60.0
pH, units	8.69
Conductivity, us/cm	614
Temperature, Water°F	50.0
Temperature, Air °F	60.0

Laboratory Analyses, mg/l

Total Dissolved Solids	356
Total Hardness	325
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	292
Calcium (Ca)	71
Chloride (Cl-)	3
Iron-Dissolved (Fe)	-0.02
Magnesium (Mg)	36
Manganese (Mn)	-0.01
Potassium (k)	1
Sodium (Na)	16
Sulfate (SO_4^{-2})	31
Cations meq/l	7.23
Anions meq/l	6.57
Cation/Anion Balance (%)	4.78

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #18

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		

Field Measurements

Flow, gpm	60.0
pH, units	8.60
Conductivity, us/cm	573
Temperature, Water°F	62.5
Temperature, Air °F	65.0

Laboratory Analyses, mg/l

Total Dissolved Solids	324
Total Hardness	327
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	288
Calcium (Ca)	75
Chloride (Cl-)	3
Iron-Dissolved (Fe)	-0.02
Magnesium (Mg)	34
Manganese (Mn)	0.01
Potassium (k)	2
Sodium (Na)	9
Sulfate (SO_4^{-2})	16
Cations meq/l	6.99
Anions meq/l	6.38
Cation/Anion Balance (%)	4.56

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Spring #21

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	05/21/88		

Field Measurements

Flow, gpm	100.0
pH, units	8.79
Conductivity, us/cm	562
Temperature, Water°F	41.5
Temperature, Air °F	49.0

Laboratory Analyses, mg/l

Total Dissolved Solids	286
Total Hardness	241
Carbonate (CO_3^{-2})	0
Bicarbonate (HCO_3-)	219
Calcium (Ca)	47
Chloride (Cl-)	2
Iron-Dissolved (Fe)	0.02
Magnesium (Mg)	30
Manganese (Mn)	-0.01
Potassium (k)	1
Sodium (Na)	15
Sulfate (SO_4^{-2})	8
Cations meq/l	5.50
Anions meq/l	5.60
Cation/Anion Balance (%)	-0.90

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: UG-2N (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/04/88	05/18/88		

Field Measurements

Flow, gpm	37.5	33.3
pH, units	7.11	7.09
Conductivity, us/cm	1424	1402
Temperature, Water°F	62.4	63.6
Temperature, Air °F	56.0	56.0

Laboratory Analyses, mg/l

Total Dissolved Solids
Total Hardness
Carbonate (CO_3^{-2})
Bicarbonate (HCO_3-)
Calcium (Ca)
Chloride (Cl-)
Iron-Dissolved (Fe)
Magnesium (Mg)
Manganese (Mn)
Potassium (k)
Sodium (Na)
Sulfate (SO_4^{-2})
Cations meq/l
Anions meq/l
Cation/Anion Balance (%)

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: UG-3N8E (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/04/88	05/18/88		

Field Measurements

Flow, gpm	50.0	5.2
pH, units	8.43	7.91
Conductivity, us/cm	1093	1141
Temperature, Water°F	51.3	54.2
Temperature, Air °F	54.0	57.0

Laboratory Analyses, mg/l

Total Dissolved Solids
Total Hardness
Carbonate (CO_3^{-2})
Bicarbonate (HCO_3-)
Calcium (Ca)
Chloride (Cl-)
Iron-Dissolved (Fe)
Magnesium (Mg)
Manganese (Mn)
Potassium (k)
Sodium (Na)
Sulfate (SO_4^{-2})
Cations meq/l
Anions meq/l
Cation/Anion Balance (%)

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: UG-Shaft (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/04/88	05/19/88		
Field Measurements				
Flow, gpm	10.0	8.3		
pH, units	6.88	6.83		
Conductivity, us/cm	1566	1398		
Temperature, Water°F	46.3	47.2		
Temperature, Air °F	45.0	49.0		
Laboratory Analyses, mg/l				
Total Dissolved Solids				
Total Hardness				
Carbonate (CO_3^{-2})				
Bicarbonate (HCO_3-)				
Calcium (Ca)				
Chloride (Cl-)				
Iron-Dissolved (Fe)				
Magnesium (Mg)				
Manganese (Mn)				
Potassium (k)				
Sodium (Na)				
Sulfate (SO_4^{-2})				
Cations meq/l				
Anions meq/l				
Cation/Anion Balance (%)				

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: UG-10E (Water First Encountered on 04/11/88)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date					05/18/88	06/22/88						
Field Measurements												
Flow, gpm					62.5	62.5						
pH, units					8.55	8.37						
Conductivity, us/cm					1464	1443						
Temperature, Water °F					62.2	62.8						
Temperature, Air °F					56.0	56.0						
Laboratory Analyses, mg/1												
Total Dissolved Solids					834							
Total Hardness					139							
Carbonate (CO)					46							
Bicarbonate (HCO)					663							
Calcium (Ca)					13							
Chloride (Cl-)					25							
Iron-Dissolved (Fe)					-0.02							
Magnesium (Mg)					26							
Manganese (Mn)					-0.01							
Potassium (k)					17							
Sodium (Na)					302							
Sulfate (SO)					39							
Cations meq/l					16.51							
Anions meq/l					15.70							
Cation/Anion Balance (%)					2.51							

Note: Negative sign "-" denotes that the value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Scheduled Sample Month	Feb	May	Aug	Nov

Sample Site ID: 5-1 (Well)

Sample Date	Site Not Accessible	05/21/88
Water Level Measurement, ft.		309.0

Sample Site ID: 10-2 (Well)

Sample Date	Site Not Accessible	05/21/88
Water Level Measurement, ft.		715.9

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: MW-2 (Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	01/22/88	02/10/88	03/17/88	04/22/88	05/19/88	06/17/88						
Field Measurements												
Flow, gpm	230	620	300	300	200	200						
pH, units	8.42	8.70	8.75	8.70	8.45	8.85						
Conductivity, us/cm	1434	1939	1725	1521	1690	1565						
Temperature, Water °F	46.2	51.5	50.0	59.4	59.9	59.0						
Temperature, Air °F	9.0	32.0	32.0	55.0	63.0	75.0						
Laboratory Analyses, mg/l												
Total Dissolved Solids	832	1126	1552	1004	1002	976						
Total Suspended Solids	2	2	42	4	2	6						
Total Settleable Solids/hr	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1						
Iron, Dissolved (Fe)	0.51	0.15	0.06	0.04	0.17	.11						
Iron, Total (Fe)	1.16	0.69	1.94	0.37	0.23	.13						
Manganese (Mn)	0.01	0.01	0.02	0.01	-0.01	-0.01						
Oil & Grease	1	1	1	1	-1	-1						

Note: Negative sign "-" denotes that the value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: MW-1 (Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge						
Field Measurements												
Flow, gpm												
pH, units												
Conductivity, us/cm												
Temperature, Water °F												
Temperature, Air °F												
Laboratory Analyses, mg/l												
Total Dissolved Solids												
Total Suspended Solids												
Total Settleable Solids/hr												
Iron, Dissolved (Fe)												
Iron, Total (Fe)												
Manganese (Mn)												
Oil & Grease												

Note: Negative sign "-" denotes that the value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1988

Sample Site ID: Banning 001

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	No Discharge	No Discharge	No Discharge	No Discharge	05/20/88	06/15/88						
Field Measurements												
Flow, gpm					32.0	66.0						
pH, units					7.76	8.33						
Conductivity, us/cm					4110	3790						
Temperature, Water °F					54.8	55.7						
Temperature, Air °F					68.0	-						
Laboratory Analyses, mg/l												
Total Dissolved Solids					3872	4074						
Total Suspended Solids					4	4						
Total Settleable Solids/hr					-0.1	-0.1						
Iron, Dissolved (Fe)					0.4	.03						
Iron, Total (Fe)					0.5	.10						
Manganese (Mn)					-0.01	-0.01						
Oil & Grease					-1	-1						

Note: Negative sign "-" denotes that the value is less than.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: MW2
Sample Date Time: 04/22/88 10:00

Lab No. : 88-WI/02032
Date Received: 04/26/88

Parameters			Analysis Date
Oil and Grease	1.	mg/l	05/03/88
Solids, total dissolved	1004.	mg/l	04/28/88
Solids, total suspended	4.	mg/l	04/28/88
Solids, settleable	-.1	ml/l/hr	04/28/88
Iron, dissolved	.04	mg/l	05/03/88
Iron, total	.37	mg/l	05/03/88
Manganese, total	.01	mg/l	05/03/88

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: MW2
Sample Date Time: 05/19/88 15:00

Lab No. : 88-WI/02711
Date Received: 05/24/88

Parameters			Analysis Date
Oil and Grease	-1.	mg/l	06/08/88
Solids, total dissolved	1002.	mg/l	05/27/88
Solids, total suspended	2.	mg/l	05/27/88
Solids, settleable	-.1	ml/l/hr	05/27/88
Iron, dissolved	.17	mg/l	06/01/88
Iron, total	.23	mg/l	06/01/88
Manganese, total	-.01	mg/l	06/01/88

Remarks: Lab Filtering Required on "WHITE & GREEN" Bottles #2711-12
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen /S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: BANNING
Sample Date Time: 05/20/88 09:50

Lab No. : 88-WI/02712
Date Received: 05/24/88

Parameters			Analysis Date
Oil and Grease	-1.	mg/l	06/08/88
Solids, total dissolved	3872.	mg/l	05/27/88
Solids, total suspended	4.	mg/l	05/27/88
Solids, settleable	-.1	ml/l/hr	05/27/88
Iron, dissolved	.04	mg/l	06/01/88
Iron, total	.50	mg/l	06/01/88
Manganese, total	-.01	mg/l	06/01/88

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen /S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: G1 Lab No. : 88-WI/02838
Sample Date Time: 05/19/88 13:15 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	308.	mg/l
Bicarbonate as CaCO3	308	mg/l
Calcium, dissolved	43.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	11.	mg/l
Hardness as CaCO3	284.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	43.	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	2.	mg/l
SAR in water	1.46	
Sodium, dissolved	56.	mg/l
Sulfate	86.	mg/l
Cations (sum)	8.19	meq/l
Anions (sum)	8.27	meq/l
Cation-Anion Balance	-.49	%
Solids, total dissolved	414.	mg/l
Solids, total suspended	188.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	.08	mg/l
Manganese, dissolved	.01	mg/l

Remarks: Lab Filtering Required on "GREEN&WHITE" Bottles #2838-47
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/SH.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: G2 Lab No. : 88-WI/02839
Sample Date Time: 05/19/88 12:20 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	258.	mg/l
Bicarbonate as CaCO3	258	mg/l
Calcium, dissolved	67.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	2.	mg/l
Hardness as CaCO3	282.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	28.	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.31	
Sodium, dissolved	12.	mg/l
Sulfate	19.	mg/l
Cations (sum)	6.20	meq/l
Anions (sum)	5.61	meq/l
Cation-Anion Balance	5.00	%
Solids, total dissolved	276.	mg/l
Solids, total suspended	94.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	.06	mg/l
Manganese, dissolved	.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen /S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: G5 Lab No. : 88-WI/02840
Sample Date Time: 05/20/88 08:20 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	288.	mg/l
Bicarbonate as CaCO3	288	mg/l
Calcium, dissolved	46.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	16.	mg/l
Hardness as CaCO3	275.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	39.	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	3.	mg/l
SAR in water	1.22	
Sodium, dissolved	46.	mg/l
Sulfate	62.	mg/l
Cations (sum)	7.60	meq/l
Anions (sum)	7.51	meq/l
Cation-Anion Balance	.60	%
Solids, total dissolved	364.	mg/l
Solids, total suspended	70.	mg/l
Solids, settleable	-.2	ml/l/hr
Iron, dissolved	.04	mg/l
Manganese, dissolved	.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: UG-10E
Sample Date Time: 05/18/88 12:30

Lab No. : 88-WI/02841
Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	709.	mg/l
Bicarbonate as CaCO3	663	mg/l
Calcium, dissolved	13.	mg/l
Carbonate as CaCO3	46	mg/l
Chloride	25.	mg/l
Hardness as CaCO3	139.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	26.	mg/l
Potassium, dissolved	17.	mg/l
SAR in water	11.27	
Sodium, dissolved	302.	mg/l
Sulfate	39.	mg/l
Cations (sum)	16.51	meq/l
Anions (sum)	15.70	meq/l
Cation-Anion Balance	2.51	%
Solids, total dissolved	834.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: SPRING #4 Lab No. : 88-WI/02842
Sample Date Time: 05/21/88 08:25 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	229.	mg/l
Bicarbonate as CaCO3	229	mg/l
Calcium, dissolved	41.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	3.	mg/l
Hardness as CaCO3	234.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	32.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.49	
Sodium, dissolved	17.	mg/l
Sulfate	16.	mg/l
Cations (sum)	5.45	meq/l
Anions (sum)	5.00	meq/l
Cation-Anion Balance	4.31	%
Solids, total dissolved	258.	mg/l
Iron, dissolved	.04	mg/l
Manganese, dissolved	.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: SPRING #5 Lab No. : 88-WI/02843
Sample Date Time: 05/20/88 13:00 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	260.	mg/l
Bicarbonate as CaCO3	260	mg/l
Calcium, dissolved	67.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	6.	mg/l
Hardness as CaCO3	299.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	32.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.38	
Sodium, dissolved	15.	mg/l
Sulfate	35.	mg/l
Cations (sum)	6.66	meq/l
Anions (sum)	6.10	meq/l
Cation-Anion Balance	4.39	%
Solids, total dissolved	308.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: SPRING #8 Lab No. : 88-WI/02844
Sample Date Time: 05/21/88 08:10 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	265.	mg/l
Bicarbonate as CaCO3	265	mg/l
Calcium, dissolved	34.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	4.	mg/l
Hardness as CaCO3	241.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	38.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.94	
Sodium, dissolved	33.	mg/l
Sulfate	25.	mg/l
Cations (sum)	6.29	meq/l
Anions (sum)	5.94	meq/l
Cation-Anion Balance	2.86	%
Solids, total dissolved	322.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen /S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: SPRING #15 Lab No. : 88-WI/02845
Sample Date Time: 05/21/88 11:50 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	292.	mg/l
Bicarbonate as CaCO3	292	mg/l
Calcium, dissolved	71.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	3.	mg/l
Hardness as CaCO3	325.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	36.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.39	
Sodium, dissolved	16.	mg/l
Sulfate	31.	mg/l
Cations (sum)	7.23	meq/l
Anions (sum)	6.57	meq/l
Cation-Anion Balance	4.78	%
Solids, total dissolved	356.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: SPRING #18 Lab No. : 88-WI/02846
Sample Date Time: 05/21/88 12:15 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	288.	mg/l
Bicarbonate as CaCO3	288	mg/l
Calcium, dissolved	75.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	3.	mg/l
Hardness as CaCO3	327.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	34.	mg/l
Potassium, dissolved	2.	mg/l
SAR in water	.22	
Sodium, dissolved	9.	mg/l
Sulfate	16.	mg/l
Cations (sum)	6.99	meq/l
Anions (sum)	6.38	meq/l
Cation-Anion Balance	4.56	%
Solids, total dissolved	324.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:
Sample ID: SPRING #21 Lab No. : 88-WI/02847
Sample Date Time: 05/21/88 09:10 Date Received: 05/27/88

Parameters

Alkalinity as CaCO3	269.	mg/l
Bicarbonate as CaCO3	219	mg/l
Calcium, dissolved	47.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	2.	mg/l
Hardness as CaCO3	241.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	30.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.43	
Sodium, dissolved	15.	mg/l
Sulfate	8.	mg/l
Cations (sum)	5.50	meq/l
Anions (sum)	5.60	meq/l
Cation-Anion Balance	-.90	%
Solids, total dissolved	286.	mg/l
Iron, dissolved	.02	mg/l
Manganese, dissolved	-.01	mg/l

Remarks:
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: MW-2
Sample Date Time: 06/17/88 10:15

Lab No. : 88-WI/03535
Date Received: 06/22/88

Parameters			Analysis Date
Oil and Grease	-1.	mg/l	06/29/88
Solids, total dissolved	976.	mg/l	06/22/88
Solids, total suspended	6.	mg/l	06/22/88
Solids, settleable	-.1	ml/l/hr	06/22/88
Iron, dissolved	.11	mg/l	06/30/88
Iron, total	.13	mg/l	06/28/88
Manganese, total	-.01	mg/l	06/28/88

Remarks: Lab Filtering Required on "GREEN" Bottles #3535
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: BANNING
Sample Date Time: 06/15/88 09:30

Lab No. : 88-WI/03526
Date Received: 06/21/88

Parameters			Analysis Date
Oil and Grease	-1.	mg/l	06/29/88
Solids, total dissolved	4074.	mg/l	06/22/88
Solids, total suspended	4.	mg/l	06/22/88
Solids, settleable	-.1	ml/l/hr	06/22/88
Iron, dissolved	.03	mg/l	06/30/88
Iron, total	.10	mg/l	06/28/88
Manganese, total	-.01	mg/l	06/28/88

Remarks: Lab Filtering Required on "GREEN" Bottle #3526
Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: BANNING 001
Sample Date Time: 07/01/88 13:00

Lab No. : 88-WI/03903
Date Received: 07/05/88

Parameters

Alkalinity as CaCO3	344.	mg/l
Bicarbonate as CaCO3	344	mg/l
Boron, dissolved	.08	mg/l
Calcium, dissolved	290.	mg/l
Carbonate as CaCO3	0	mg/l
Chloride	115.	mg/l
Fluoride	.2	mg/l
Hardness as CaCO3	2250.	mg/l
Hydroxide as CaCO3	0	mg/l
Magnesium, dissolved	372.	mg/l
Nitrogen, ammonia	.06	mg/l
Nitrate as N, dissolved	.42	mg/l
Nitrite as N, dissolved	-.01	mg/l
Oil and Grease	-1.	mg/l
Phosphate	.1	mg/l
Phosphorus, ortho diss	.02	mg/l
Potassium, dissolved	4.	mg/l
Sodium, dissolved	294.	mg/l
Sulfate	2330.	mg/l
Sulfide as S	.4	mg/l
Cations (sum)	58.04	meq/l
Anions (sum)	59.03	meq/l
Cation-Anion Balance	-.85	%
Solids, total dissolved	3972.	mg/l
Solids, total suspended	-2.	mg/l
Solids, settleable	-.1	ml/l/hr
Aluminum, dissolved	-.05	mg/l
Arsenic, dissolved	-.001	mg/l
Barium, dissolved	.07	mg/l
Cadmium, dissolved	-.005	mg/l
Chromium, dissolved	-.01	mg/l
Copper, dissolved	-.01	mg/l
Iron, dissolved	.04	mg/l
Iron, total	.07	mg/l
Lead, dissolved	-.02	mg/l
Manganese, total	.01	mg/l
Manganese, dissolved	-.01	mg/l
Mercury, dissolved	-.0001	mg/l
Molybdenum, dissolved	-.05	mg/l
Nickel, dissolved	-.02	mg/l
Selenium, dissolved	.029	mg/l
Zinc, dissolved	.05	mg/l

Remarks: Lab Filtering Required on "GREEN" Bottle

Note: Negative sign "-" denotes that the value is less than "<"

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.