SOLDIER CREEK COAL

ANNUAL REPORT

1993

ANNUAL REPORT

SOLDIER CREEK COAL COMPANY

- SOLDIER CANYON MINE ACT/007/018

- HANNING LOADOUT ACT/007/034

1993

COAL MINING AND RECLAMATION OPERATIONS FOR 1993

(Must be submitted to the Division by April 15, 1994)

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203
(801) 538-5340

Permittee: Soldier Creek Coal Company

Mine Name: Soldier Canyon Mine

Mailing Address: P.O. Box 1029 Wellington, Utah 84542

Company Representative: R.W. Olsen

Resident Agent: C.T. Corporation System

Permit Number: ACT/007/018, ACT/007/034

MSHA ID Number: 42-00077, 42-01756

Date of Initial Permanent Program Permit: June 10, 1985 Revised February 3, 1987

Date of Permit Renewal: February 3, 1997

Quantity of Coal Mined (tonnage) 1993: 512,621

Attach Updated Mine Sequence Map(s) showing mine development through December 31, 1993. (Same as Lease Royalty Payment Map and/or MSHA Progress Map)

All monitoring activities during the report period to be submitted with this report (including, but not limited to):

A. General

1. **Discuss anomalies, missing data and monitoring changes made throughout the year.**
2. **Summarize any corrective actions and the results that may have occurred during the year.**

B. Water Monitoring Data:
Groundwater Summary

1. **Mine Discharge**
   a. **Summarize the total annual discharge from mine water discharge points and breakdown on a monthly basis for each site.**
   b. **Discuss the past five years of data comparing changes in discharge. Elements such as mining rate, location of faults or large in-mine flows during the year should be discussed.**
   c. **Discuss trends and exceedence in water quality parameters. A correlation with flow could provide additional information.**

SOLDIER CREEK COAL COMPANY

MINE DISCHARGE FLOW DATA – 1993

STATION MW – 2

MONTH	GAGE READING STARTING	GAGE READING ENDING	FLOW (GAL)	COMMENTS
JANUARY	46933093	61605406	14672313	
FEBRUARY	61605406	76806123	15200717	
MARCH	76806123	93148494	16342371	
APRIL	93148494	107357052	14208558	
MAY	0	15404525	15404525	METER RESET
JUNE	15404525	27843680	12439155	
JULY	27843680	41627552	13783872	
AUGUST	41627552	55814588	14187036	
SEPTEMBER	55814588	70448448	14633860	
OCTOBER	70448448	85872048	15423600	
NOVEMBER	85872048	99982405	14110357	
DECEMBER	99982405	111715414	11733009	METER RESET
		YEARLY TOTAL	172139373	

WATER QUALITY DATA – 1993

SOLDIER CREEK COAL COMPANY

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. G-1 (upper Soldier Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		778	50	
pH, units		8.67	8.81	
Conductivity, us/cm		590	636	
Temperature, Water °F		48.5	54.5	
Temperature, Air °F		55	75	
Dissolved Oxygen, ppm		5.3	5.9	
Laboratory Analyses, mg/l				
Total Dissolved Solids		392	422	
Total Suspended Solids		22	40	
Total Settleable Solids/hr		-.2	-.1	
Total Hardness		292	199	
Carbonate (CO_3^{-2})		20	28	
Bicarbonate (HCO_3-)		282	316	
Calcium (Ca)		53	27	
Chloride (Cl-1)		8	14	
Iron-Dissolved (Fe)		.03	-.02	
Magnesium (Mg)		39	32	
Manganese (Mn)		-.01	-.01	
Potassium (k)		1	2	
Sodium (Na)		45	83	
Sulfate (SO_4^{-2})		54	45	
Oil & Grease		-1	-1	
Cations meq/l		7.85	7.68	
Anions meq/l		7.40	8.22	
Cation/Anion Balance (%)		2.95	-3.40	
Nitrate, Dissolved		-.02	.01	
Nitrite, Dissolved		-.01	.02	
Alkalinity		302	344	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. G-2 (upper Pine Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		1293	45	
pH, units		8.56	8.63	
Conductivity, us/cm		472	423	
Temperature, Water °F		42.2	50.3	
Temperature, Air °F		45	75	
Dissolved Oxygen, ppm		5.8	5.9	
Laboratory Analyses, mg/l				
Total Dissolved Solids		298	284	
Total Suspended Solids		-2	22	
Total Settleable Solids/hr		-.2	-.1	
Total Hardness		282	244	
Carbonate (CO_3^{-2})		16	12	
Bicarbonate (HCO_3-)		256	248	
Calcium (Ca)		70	55	
Chloride (Cl-)		5	3	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		26	26	
Manganese (Mn)		-.01	-.01	
Potassium (k)		-1	1	
Sodium (Na)		11	17	
Sulfate (SO_4^{-2})		18	21	
Oil & Grease		-1	1	
Cations meq/l		6.09	5.66	
Anions meq/l		5.96	5.73	
Cation/Anion Balance (%)		1.08	-.61	
Nitrate, Dissolved		-.02	-.02	
Nitrite, Dissolved		-.01	.02	
Alkalinity		272	260	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. UG-1N (In-mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/25/93	05/20/93	08/23/93	11/12/93
Field Measurements				
Flow, gpm	NA	NA	NA	NA
pH, units	8.29	7.95	7.93	8.15
Conductivity, us/cm	1046	956	904	924
Temperature, Water °F	54.6	59	56.4	54.5
Temperature, Air °F	60	57	59	58
Laboratory Analyses, mg/l				
Total Dissolved Solids			612	
Total Hardness			214	
Carbonate (CO_3^{-2})			0	
Bicarbonate (HCO_3-)			518	
Calcium (Ca)			33	
Chloride (Cl-1)			30	
Iron-Dissolved (Fe)			.06	
Magnesium (Mg)			32	
Manganese (Mn)			-.01	
Potassium (k)			17	
Sodium (Na)			164	
Sulfate (SO_4^{-2})			46	
Cations meq/l			11.93	
Anions meq/l			12.17	
Cation/Anion Balance (%)			-1.00	
Nitrate, Dissolved			.07	
Nitrite, Dissolved			-.01	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. G-5 (lower Soldier Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/22/93	06/02/93	08/24/93	11/30/93
Field Measurements				
Flow, gpm	210	2423	249	324
pH, units	8.35	8.75	8.65	8.49
Conductivity, us/cm	1370	625	566	950
Temperature, Water °F	45	51.7	63.5	36.8
Temperature, Air °F	30	65	85	40
Dissolved Oxygen, ppm	5.8	5.7	5.9	6.7
Laboratory Analyses, mg/l				
Total Dissolved Solids	820	404	658	686
Total Suspended Solids	10	20	48	10
Total Settleable Solids/hr	-.1	-.2	-.1	-.1
Total Hardness ($CaCO_3$)	219	265	188	278
Carbonate ($CaCO_3$)	16	20	60	0
Bicarbonate (HCO_3-) ($CaCO_3$)	656	298	474	450
Calcium (Ca)	35	47	21	44
Chloride	54	16	40	43
Iron-Dissolved (Fe)	.03	.02	.05	-.02
Magnesium (Mg)	32	36	33	41
Manganese (Mn)	-.01	-.01	-.01	.01
Potassium (k)	18	4	13	6
Sodium (Na)	274	66	211	149
Sulfate (SO_4^{-2})	82	70	103	129
Oil & Grease	2	-1	-1	-1
Cations meq/l	16.90	8.31	13.38	-
Anions meq/l	16.67	8.28	13.96	-
Cation/Anion Balance (%)	.69	.18	-2.12	-2.54
Nitrate, Dissolved	.94	.05	.42	.36
Nitrite, Dissolved	.08	.02	.12	.01
Alkalinity	672	318	534	450

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #3

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		DRY	DRY	
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 (%)				
Nitrate, Dissolved				
Nitrite, Dissolved				

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #4

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		8.1	2	
pH, units		8.54	8.65	
Conductivity, us/cm		481	457	
Temperature, Water °F		47	57.9	
Temperature, Air °F		45	75	
Laboratory Analyses, mg/l				
Total Dissolved Solids		296	306	
Total Hardness		263	238	
Carbonate (CO_3^{-2})		0	28	
Bicarbonate (HCO_3-)		260	242	
Calcium (Ca)		56	46	
Chloride (Cl-1)		3	5	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		30	30	
Manganese (Mn)		-.01	-.01	
Potassium (k)		-1	-1	
Sodium (Na)		23	25	
Sulfate (SO_4^{-2})		47	16	
Cations meq/l		6.25	5.83	
Anions meq/l		6.27	5.88	
Cation/Anion Balance (%)		-.16	-.43	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #5

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		135	5	
pH, units		8.46	8.87	
Conductivity, us/cm		488	356	
Temperature, Water °F		48	61.3	
Temperature, Air °F		60	70	
Laboratory Analyses, mg/l				
Total Dissolved Solids		310	258	
Total Hardness		295	194	
Carbonate (CO_3^{-2})		16	28	
Bicarbonate (HCO_3-)		258	154	
Calcium (Ca)		72	25	
Chloride (Cl-)		5	5	
Iron-Dissolved (Fe)		.03	-.02	
Magnesium (Mg)		28	32	
Manganese (Mn)		.01	-.01	
Potassium (k)		1	-1	
Sodium (Na)		14	21	
Sulfate (SO_4^{-2})		58	54	
Cations meq/l		6.54	4.77	
Anions meq/l		6.84	4.91	
Cation/Anion Balance (%)		-2.24	-1.45	
Nitrate, Dissolved		-.02	-.02	
Nitrite, Dissolved		-.01	.02	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #8

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		20	5	
pH, units		8.38	8.62	
Conductivity, us/cm		480	488	
Temperature, Water °F		48	54.8	
Temperature, Air °F		50	75	
Laboratory Analyses, mg/l				
Total Dissolved Solids		308	290	
Total Hardness		249	254	
Carbonate (CO_3^{-2})		0	0	
Bicarbonate (HCO_3-)		278	266	
Calcium (Ca)		42	46	
Chloride (Cl-)		3	3	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		35	34	
Manganese (Mn)		-.01	-.01	
Potassium (k)		1	-1	
Sodium (Na)		37	36	
Sulfate (SO_4^{-2})		60	19	
Cations meq/l		6.62	6.65	
Anions meq/l		6.90	6.20	
Cation/Anion Balance (%)		-2.07	3.50	
Nitrate, Dissolved		-.02	.03	
Nitrite, Dissolved		-.01	.03	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #10

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	11/30/93
Field Measurements				
Flow, gpm		4	4	3
pH, units		8.32	8.76	7.80
Conductivity, us/cm		863	862	738
Temperature, Water °F		47.6	59.9	51.1
Temperature, Air °F		50	85	45
Laboratory Analyses, mg/l				
Total Dissolved Solids		558	572	582
Total Hardness		174	145	154
Carbonate (CO_3^{-2}) ($CaCO_3$)		48	0	0
Bicarbonate ($CaCO_3$)		452	516	510
Calcium (Ca)		27	22	24
Chloride		25	4	30
Iron-Dissolved (Fe)		-.02	-.02	-.02
Magnesium (Mg)		26	22	23
Manganese (Mn)		-.01	-.01	-.01
Potassium (k)		3	2	3
Sodium (Na)		187	176	181
Sulfate (SO_4^{-2})		66	29	35
Cations meq/l		11.79	10.70	-
Anions meq/l		12.09	11.04	-
Cation/Anion Balance (%)		-1.26	-1.56	-2.79
Nitrate, Dissolved		-.02	-.02	-.02
Nitrite, Dissolved		.05	.03	-.01

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #15

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/01/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		300	10	
pH, units		8.54	8.65	
Conductivity, us/cm		559	554	
Temperature, Water °F		44.7	54	
Temperature, Air °F		45	80	
Laboratory Analyses, mg/l				
Total Dissolved Solids		336	350	
Total Hardness		323	345	
Carbonate (CO_3^{-2})		0	0	
Bicarbonate (HCO_3-)		306	348	
Calcium (Ca)		75	74	
Chloride (Cl-)		4	3	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		33	39	
Manganese (Mn)		-.01	-.01	
Potassium (k)		1	2	
Sodium (Na)		14	17	
Sulfate (SO_4^{-2})		56	19	
Cations meq/l		7.10	7.70	
Anions meq/l		7.41	7.44	
Cation/Anion Balance (%)		-2.14	1.72	
Nitrate, Dissolved		-.02	.03	
Nitrite, Dissolved		-.01	.03	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #18

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/01/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		70	15	
pH, units		8.31	8.20	
Conductivity, us/cm		459	511	
Temperature, Water °F		49.8	62.3	
Temperature, Air °F		50	80	
Laboratory Analyses, mg/l				
Total Dissolved Solids		298	338	
Total Hardness		292	280	
Carbonate (CO_3^{-2})		16	0	
Bicarbonate (HCO_3-)		262	314	
Calcium (Ca)		74	61	
Chloride (Cl-)		3	4	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		26	31	
Manganese (Mn)		-.01	0.19	
Potassium (k)		1	7	
Sodium (Na)		8	10	
Sulfate (SO_4^{-2})		41	12	
Cations meq/l		6.21	6.21	
Anions meq/l		6.51	6.64	
Cation/Anion Balance (%)		-2.36	-3.35	
Nitrate, Dissolved		-.02	-.02	
Nitrite, Dissolved		-.01	.02	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. Spring #21

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		135	20	
pH, units		8.62	8.60	
Conductivity, us/cm		470	487	
Temperature, Water °F		46	58.5	
Temperature, Air °F		45	80	
Laboratory Analyses, mg/l				
Total Dissolved Solids		294	276	
Total Hardness		299	247	
Carbonate (CO_3^{-2})		0	0	
Bicarbonate (HCO_3-)		276	274	
Calcium (Ca)		72	56	
Chloride (Cl-)		2	2	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		29	26	
Manganese (Mn)		-.01	-.01	
Potassium (k)		-1	-1	
Sodium (Na)		15	15	
Sulfate (SO_4^{-2})		49	8	
Cations meq/l		6.61	5.57	
Anions meq/l		6.60	5.70	
Cation/Anion Balance (%)		.08	-1.15	
Nitrate, Dissolved		.04	.03	
Nitrite, Dissolved		-.01	.03	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. UG-3W (In-mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	2/25/93	05/20/93	08/23/93	11/12/93
Field Measurements				
Flow, gpm	34.2	27.8	37.5	31.2
pH, units	8.23	7.52	7.64	7.66
Conductivity, us/cm	1259	1199	1212	1031
Temperature, Water °F	59.3	60.6	59.8	61.3
Temperature, Air °F	56	57	61	58
Laboratory Analyses, mg/l				
Total Dissolved Solids			828	
Total Hardness			368	
Carbonate (CO_3^{-2})			0	
Bicarbonate (HCO_3-)			658	
Calcium (Ca)			75	
Chloride (Cl-)			26	
Iron-Dissolved (Fe)			.14	
Magnesium (Mg)			44	
Manganese (Mn)			.08	
Potassium (k)			25	
Sodium (Na)			197	
Sulfate (SO_4^{-2})			118	
Cations meq/l			16.68	
Anions meq/l			16.37	
Cation/Anion Balance (%)			.94	
Nitrate, Dissolved			-.02	
Nitrite, Dissolved			.02	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. UG-11E (In-mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	2/25/93	05/20/93	08/23/93	11/12/93
Field Measurements				
Flow, gpm	131.9	121.8	142	201
pH, units	8.53	8.44	8.50	8.60
Conductivity, us/cm	1737	16.9	1611	1273
Temperature, Water °F	68.7	68.9	68.6	65.5
Temperature, Air °F	52	56	61	55
Laboratory Analyses, mg/l				
Total Dissolved Solids			1134	
Total Hardness			121	
Carbonate (CO_3^{-2})			52	
Bicarbonate (HCO_3-)			906	
Calcium (Ca)			22	
Chloride (Cl-)			45	
Iron-Dissolved (Fe)			.10	
Magnesium (Mg)			16	
Manganese (Mn)			-.01	
Potassium (k)			15	
Sodium (Na)			430	
Sulfate (SO_4^{-2})			89	
Cations meq/l			21.72	
Anions meq/l			22.29	
Cation/Anion Balance (%)			-1.30	
Nitrate, Dissolved			.03	
Nitrite, Dissolved			-.01	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. UG-10E (In-mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/25/93	Inaccessible	Inaccessible	Inaccessible
Field Measurements				
Flow, gpm	NA			
pH, units	8.45			
Conductivity, us/cm	897			
Temperature, Water °F	57.7			
Temperature, Air °F	59			
Laboratory Analyses, mg/l				
Total Dissolved Solids				
Total Hardness				
Carbonate (CO_3^{-2})				
Bicarbonate (HCO_3-)				
Calcium (Ca)				
Chloride (Cl-1)				
Iron-Dissolved (Fe)				
Magnesium (Mg)				
Manganese (Mn)				
Potassium (k)				
Sodium (Na)				
Sulfate (SO_4^{-2})				
Cations meq/l				
Anions meq/l				
Cation/Anion Balance (%)				
Nitrate, Dissolved				
Nitrite, Dissolved				

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. (Anderson Reservoir)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/02/93	08/24/93	Site Not Accessible
Field Measurements				
Flow, gpm		No Flow	No Flow	
pH, units		8.90	8.85	
Conductivity, us/cm		1131	1053	
Temperature, Water °F		65	71.1	
Temperature, Air °F		70	85	
Laboratory Analyses, mg/l				
Total Dissolved Solids		814	834	
Total Hardness		278	260	
Carbonate (CO_3^{-2})		52	188	
Bicarbonate (HCO_3-)		378	168	
Calcium (Ca)		29	9	
Chloride (Cl-1)		64	46	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		50	58	
Manganese (Mn)		-.01	-.01	
Potassium (k)		11	9	
Sodium (Na)		215	178	
Sulfate (SO_4^{-2})		233	280	
Cations meq/l		15.30	13.27	
Anions meq/l		15.28	14.29	
Cation/Anion Balance (%)		.07	-3.70	
Nitrate, Dissolved		.21	-.02	
Nitrite, Dissolved		-.01	.02	

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

Soldier Creek Coal Company

Hydrologic Monitoring Program
Summarized Results for 1993

Sample Site I.D. UG-5E (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/25/93	Inaccessible	Inaccessible	Inaccessible
Field Measurements				
Flow, gpm	20.3			
pH, units	8.73			
Conductivity, us/cm	915			
Temperature, Water °F	53.9			
Temperature, Air °F	59			
Laboratory Analyses, mg/l				
Total Dissolved Solids				
Total Hardness				
Carbonate (CO_3^{-2})				
Bicarbonate (HCO_3-)				
Calcium (Ca)				
Chloride (Cl-1)				
Iron-Dissolved (Fe)				
Magnesium (Mg)				
Manganese (Mn)				
Potassium (k)				
Sodium (Na)				
Sulfate (SO_4^{-2})				
Cations meq/l				
Anions meq/l				
Cation/Anion Balance (%)				
Nitrate, Dissolved				
Nitrite, Dissolved				

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Site ID: 5-1 (Well)	Site Not Accessible			Site Not Accessible
Sample Date		06/02/93	08/24/93	
Water Level Measurement, ft.		340.8	340.4	
Sample Site ID: 10-2 (Well)	Site Not Accessible			Site Not Accessible
Sample Date		06/02/93	08/24/93	
Water Level Measurement, ft.		723.4	724.0	
Sample Site ID: 6-1 (Well)	Site Not Accessible			Site Not Accessible
Sample Date		06/02/93	08/24/93	
Water Level Measurement, ft.		426.6	424.5	
Sample Site ID: 32-1 (Well)	Site Not Accessible			
Sample Date		06/02/93	08/24/93	11/30/93
Water Level Measurement, ft.		297.5	295.1	294.8

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1993

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Site ID: MW-1C (Well)	Site Not Accessible		Not Monitored per D. Haddock	
Sample Date		06/02/93		11/30/93
Water Level Measurement, ft.		10.9		11.5
Sample Site ID: MW-1M (Well)	Site Not Accessible		Not Monitored per D. Haddock	
Sample Date		06/02/93		11/30/93
Water Level Measurement, ft.		20.5		21.1
Sample Site ID: MW-2M (Well)	Site Not Accessible		Not Monitored per D. Haddock	
Sample Date		06/02/93		11/30/93
Water Level Measurement, ft.		138.2		138.3
Sample Site ID: MW-3M (Well)	Site Not Accessible		Not Monitored per D. Haddock	
Sample Date		06/02/93		11/29/93
Water Level Measurement, ft.		184.0		184.4

Soldier Cr[illegible]al Company
Hydrologic Mon[illegible]ing Program
Summarized Results for 1993

Sample Site ID: NPDES 001 (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	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												
Nitrate, Dissolved												
Nitrite, Dissolved												

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

Hydmonit/

Soldier Cre[illegible]l Company
Hydrologic Mon[illegible]ng Program
Summarized Results for 1993

Sample Site ID: NPDES 002 (Mine Facilities Sediment Pond)

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	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	12/13/93
Field Measurements												
Flow, gpm												6732 gal.
pH, units												8.42
Conductivity, us/cm												3720
Temperature, Water °F												38.5
Temperature, Air °F												30
Laboratory Analyses, mg/l												
Total Dissolved Solids												3180
Total Suspended Solids												16
Total Settleable Solids/hr												-.4
Iron, Dissolved (Fe)												-.02
Iron, Total (Fe)												.78
Manganese (Mn)												.05
Oil & Grease												-1
Nitrate, Dissolved												.33
Nitrite, Dissolved												1.01

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

Hydmonit/

Soldier Cre[illegible]l Company
Hydrologic Mon[illegible]ng Program
Summarized Results for 1993

Sample Site ID: NPDES 003 (MW-2 Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	01/04/93	02/02/93	03/01/93	04/05/93	05/03/93	06/02/93	07/07/93	08/02/93	09/07/93	10/4/93	11/1/93	12/6/93
Field Measurements												
Flow, gpm	655	655	684	702	210	650	684	643	180	140	661	117
pH, units	8.47	8.20	8.46	8.23	8.46	8.17	7.86	7.85	8.33	8.09	8.35	8.63
Conductivity, us/cm	1585	1330	1359	1452	1407	1344	1356	1332	1163	1190	1061	1164
Temperature, Water °F	55.0	60.5	59.0	59.3	59.0	61.0	64.0	62.5	60.1	65	59.8	54.7
Temperature, Air °F	0	30	30	40	60	65	78	80	80	75	60	45
Laboratory Analyses, mg/l												
Total Dissolved Solids	1024	984	912	912	996	974	956	824	946	900	836	882
Total Suspended Solids	6	8	8	2	42	18	10	6	4	16	-2	4
Total Settleable Solids/hr	-.1	-.2	-.1	-.1	-.1	-.2	-.1	-.1	-.1	-.1	-.1	-.1
Iron, Dissolved (Fe)	-0.02	0.06	0.04	-	-.02	-.02	-.02	-.02	.16	-.02	.03	-.02
Iron, Total (Fe)	0.03	0.10	0.05	.03	.03	.25	.06	.04	.26	.24	-.2	-.02
Manganese (Mn)	0.01	-0.01	0.01	-.01	-.01	.01	-.01	.01	-.01	.02	-.1	-.01
Oil & Grease	2.0	1.0	2.0	4	1	-1	1	1	-1	1	1	-1
Nitrate, Dissolved	0.74	0.69	0.91	.79	1.07	.72	.74	.80	.94	.77	.63	1.04
Nitrite, Dissolved	0.12	0.09	0.05	.15	.05	.18	.24	.16	.04	.11	.14	.02

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

Soldier Cre[illegible]l Company
Hydrologic Mon[illegible]ing Program
Summarized Results for 1993

Sample Site ID: NPDES 004 (MW-3 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	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												
Nitrate, Dissolved												
Nitrite, Dissolved												

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

Hydmonit/

Soldier Cre[illegible] Company
Hydrologic Moni[illegible]ng Program
Summarized Results for 1993

Sample Site ID: UPDES 001 (Banning Discharge Point)

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	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												
Nitrate, Dissolved												
Nitrite, Dissolved												

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

Soldier Cre[illegible]l Company
Hydrologic Mon[illegible]ng Program
Summarized Results for 1993

Sample Site ID: UPDES 002 (Banning Sediment Pond)

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	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												
Nitrate, Dissolved												
Nitrite, Dissolved												

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

Hydmonit/

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: MW-2
Sample Date Time: 10/04/93 11:45

Lab No. : 93-WI/10408
Date Received: 10/08/93

Parameters			Analysis Date
Oil and Grease	1.	mg/l	10/10/93
Solids, total dissolved	900.	mg/l	10/10/93
Solids, total suspended	16.	mg/l	10/10/93
Solids, settleable	-.1	ml/l/hr	10/10/93
Nitrate as N, dissolved	.77	mg/l	10/11/93
Nitrate/Nitrite as N	0.88	mg/l	↓
Nitrite as N, dissolved	0.11	mg/l	↓
Iron, dissolved	-0.02	mg/l	10/10/93
Iron, total	0.24	mg/l	10/17/93
Manganese, total	0.02	mg/l	10/17/93

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
tn. : Mr. Tom Paluso
roject :

Sample ID: MW-2
Sample Date Time: 11/01/93 12:30

Lab No. : 93-WI/11408
Date Received: 11/08/93

Parameters

Nitrate as N, dissolved	.63	mg/l
Nitrate/Nitrite as N	0.77	mg/l
Nitrite as N, dissolved	0.14	mg/l
Oil and Grease	1.	mg/l
Solids, total dissolved	836.	mg/l
Solids, total suspended	-2.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	0.03	mg/l
Iron, total	-0.2	mg/l
Manganese, total	-0.1	mg/l

Remarks:

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

Scott Habermehl, Project Manager/SH.

nk E. Polniak, Inorganic Laboratory Supervisor/

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: MW-2
Sample Date Time: 12/06/93 11:45

Lab No. : 93-WI/12366
Date Received: 12/09/93

Parameters

Nitrate as N, dissolved	1.04	mg/l
Nitrate/Nitrite as N	1.06	mg/l
Nitrite as N, dissolved	0.02	mg/l
Oil and Grease	-1.	mg/l
Solids, total dissolved	882.	mg/l
Solids, total suspended	4.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	-0.02	mg/l
Iron, total	-0.02	mg/l
Manganese, total	-0.01	mg/l

Remarks:

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

Scott Habermehl, Project Manager /to for S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor /

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :
Sample Matrix:
Sample ID: Spring #10 Lab No. : 93-WI/12142
Sample Date Time: 11/30/93 12:43 Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	510.	mg/l
Bicarbonate as CaCO3	510	mg/l
Carbonate as CaCO3	0.	mg/l
Calcium, dissolved	24.	mg/l
Chloride	30.	mg/l
Hardness as CaCO3	154.	mg/l
Magnesium, dissolved	23.	mg/l
Nitrate as N, dissolved	-.02	mg/l
Nitrate/Nitrite as N	-0.02	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Nitrate as NO3	-.1	mg/l
Potassium, dissolved	3.	mg/l
Sodium, dissolved	181.	mg/l
Sulfate	35.	mg/l
SAR in water	6.41	
TDS Ratio (grav./calc.)	.97	
Solids, total dissolved	582.	mg/l
Cation-Anion Balance	-2.79	%
Iron, dissolved	-0.02	mg/l
Manganese, dissolved	-0.01	mg/l

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

Scott Habermehl, Project Manager /to for SH

Frank E. Polniak, Inorganic Laboratory Supervisor /FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :
Sample Matrix:
Sample ID: MW-2M
Sample Date Time: 11/30/93 20:10

Lab No. : 93-WI/12143
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	1034.	mg/l
Bicarbonate as CaCO3	1034	mg/l
Carbonate as CaCO3	0.	mg/l
Calcium, dissolved	53.	mg/l
Chloride	2440.	mg/l
Hardness as CaCO3	280.	mg/l
Magnesium, dissolved	36.	mg/l
Nitrate as N, dissolved	1.31	mg/l
Nitrate/Nitrite as N	1.31	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Nitrate as NO3	5.8	mg/l
Potassium, dissolved	12.	mg/l
Sodium, dissolved	3040.	mg/l
Sulfate	3136.	mg/l
SAR in water	79.92	
TDS Ratio (grav./calc.)	.93	
Solids, total dissolved	8632.	mg/l
Cation-Anion Balance	-5.16	%
Iron, dissolved	-0.1	mg/l
Manganese, dissolved	-0.05	mg/l

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

Scott Habermehl, Project Manager /tr for SH

Frank E. Polniak, Inorganic Laboratory Supervisor /tr

C ent : Soldier Creek Coal Company
dress : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :
Sample Matrix:
Sample ID: MW-1M Lab No. : 93-WI/12144
Sample Date Time: 11/30/93 15:45 Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	200.	mg/l
Bicarbonate as CaCO3	200	mg/l
Carbonate as CaCO3	0.	mg/l
Hydroxide as CaCO3	0.	mg/l
Calcium, dissolved	33.	mg/l
Chloride	3440.	mg/l
Hardness as CaCO3	210.	mg/l
Magnesium, dissolved	31.	mg/l
Nitrate as N, dissolved	.95	mg/l
Nitrate/Nitrite as N	1.05	mg/l
Nitrate as NO3	4.2	mg/l
Potassium, dissolved	11.	mg/l
Sodium, dissolved	2400.	mg/l
Sulfate	740.	mg/l
SAR in water	72.94	
TDS Ratio (grav./calc.)	.97	
Solids, total dissolved	6540.	mg/l
Cation-Anion Balance	-2.56	%
Iron, dissolved	0.06	mg/l
Manganese, dissolved	-0.02	mg/l

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

Scott Habermehl, Project Manager /for SH

Frank E. Polniak, Inorganic Laboratory Supervisor /

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :
Sample Matrix:
Sample ID: MW-1C
Sample Date Time: 11/30/93 15:40

Lab No. : 93-WI/12145
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	568.	mg/l
Bicarbonate as CaCO3	568	mg/l
Carbonate as CaCO3	0.	mg/l
Calcium, dissolved	417.	mg/l
Chloride	215.	mg/l
Hardness as CaCO3	4532.	mg/l
Magnesium, dissolved	851.	mg/l
Nitrate as N, dissolved	-.02	mg/l
Nitrate/Nitrite as N	-0.02	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Potassium, dissolved	30.	mg/l
Sodium, dissolved	2230.	mg/l
Sulfate	8376.	mg/l
SAR in water	14.58	
TDS Ratio (grav./calc.)	1.00	
Solids, total dissolved	12460.	mg/l
Cation-Anion Balance	-.98	%
Iron, dissolved	-0.04	mg/l
Manganese, dissolved	0.06	mg/l

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

Scott Habermehl, Project Manager

Frank E. Polniak, Inorganic Laboratory Supervisor

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :
Sample Matrix:
Sample ID: MW-3M
Sample Date Time: 11/30/93 14:30

Lab No. : 93-WI/12146
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	182.	mg/l
Bicarbonate as CaCO3	182	mg/l
Carbonate as CaCO3	0.	mg/l
Hydroxide as CaCO3	0.	mg/l
Calcium, dissolved	52.	mg/l
Chloride	8150.	mg/l
Hardness as CaCO3	220.	mg/l
Magnesium, dissolved	22.	mg/l
Nitrate as N, dissolved	0.41	mg/l
Nitrate/Nitrite as N	0.41	mg/l
[illegible]	[illegible]	[illegible]
Nitrate as NO3	1.8	mg/l
Potassium, dissolved	10.	mg/l
Sodium, dissolved	4420.	mg/l
Sulfate	134.	mg/l
SAR in water	131.06	
TDS Ratio (grav./calc.)	.92	
Solids, total dissolved	11904.	mg/l
Cation-Anion Balance	-8.19	%
Iron, dissolved	-0.1	mg/l
Manganese, dissolved	0.47	mg/l

Remarks: All cations and anions rechecked. CAB > 5%.
Note: Negative sign "-" denotes that the value is less than "<"

Scott Habermehl, Project Manager /for Scott SH

Frank E. Polniak, Inorganic Laboratory Supervisor /FE

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :
Sample Matrix:
Sample ID: G-5 Lab No. : 93-W1/12147
Sample Date Time: 11/30/93 16:57 Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	450.	mg/l
Bicarbonate as CaCO3	450	mg/l
Carbonate as CaCO3	0.	mg/l
Calcium, dissolved	44.	mg/l
Chloride	43.	mg/l
Hardness as CaCO3	278.	mg/l
Magnesium, dissolved	41.	mg/l
Nitrate as N, dissolved	0.36	mg/l
Nitrate/Nitrite as N	0.36	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Nitrate as NO3	1.6	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	6.	mg/l
Sodium, dissolved	149.	mg/l
Sulfate	129.	mg/l
SAR in water	3.93	
TDS Ratio (grav./calc.)	1.01	
Solids, total dissolved	686.	mg/l
Solids, total suspended	10.	mg/l
Solids, settleable	-.1	ml/l/hr
Cation-Anion Balance	-2.54	%
Iron, dissolved	-0.02	mg/l
Manganese, dissolved	0.01	mg/l

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

Scott Habermehl, Project Manager /H for SH

Frank E. Polniak, Inorganic Laboratory Supervisor /FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: MW-3M
Sample Date Time: 11/30/93 14:30

Lab No. : 93-WI/12146
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	182.	mg/l
Bicarbonate as CaCO3	182	mg/l
Calcium, dissolved	52.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	8150.	mg/l
Hardness as CaCO3	220.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	22.	mg/l
Nitrate as N, dissolved	0.41	mg/l
Nitrate/Nitrite as N	0.41	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Potassium, dissolved	10.	mg/l
Sodium, dissolved	4420.	mg/l
Sulfate	134.	mg/l
Cations (sum)	199.14	meq/l
Anions (sum)	234.65	meq/l
Cation-Anion Balance	-8.19	%
Solids, total dissolved	11904.	mg/l
Iron, dissolved	-0.1	mg/l
Manganese, dissolved	0.47	mg/l

Remarks: All cations and anions rechecked. CAB > 5%.

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: MW-1M
Sample Date Time: 11/30/93 15:45

Lab No. : 93-WI/12144
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	200.	mg/l
Bicarbonate as CaCO3	200	mg/l
Calcium, dissolved	33.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	3440.	mg/l
Hardness as CaCO3	210.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	31.	mg/l
Nitrate as N, dissolved	.95	mg/l
Nitrate/Nitrite as N	1.05	mg/l
Nitrite as N, dissolved	0.10	mg/l
Potassium, dissolved	11.	mg/l
Sodium, dissolved	2400.	mg/l
Sulfate	740.	mg/l
Cations (sum)	110.08	meq/l
Anions (sum)	115.86	meq/l
Cation-Anion Balance	-2.56	%
Solids, total dissolved	6540.	mg/l
Iron, dissolved	0.06	mg/l
Manganese, dissolved	-0.02	mg/l

Remarks:

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: MW-1C
Sample Date Time: 11/30/93 15:40

Lab No. : 93-WI/12145
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	568.	mg/l
Bicarbonate as CaCO3	568	mg/l
Calcium, dissolved	417.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	215.	mg/l
Hardness as CaCO3	4532.	mg/l
Magnesium, dissolved	851.	mg/l
Nitrate as N, dissolved	-.02	mg/l
Nitrate/Nitrite as N	-0.02	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Potassium, dissolved	30.	mg/l
Sodium, dissolved	2230.	mg/l
Sulfate	8376.	mg/l
Cations (sum)	189.53	meq/l
Anions (sum)	193.28	meq/l
Cation-Anion Balance	-.98	%
Solids, total dissolved	12460.	mg/l
Iron, dissolved	-0.04	mg/l
Manganese, dissolved	0.06	mg/l

Remarks:

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/FE

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: MW-2M
Sample Date Time: 11/30/93 20:10

Lab No. : 93-WI/12143
Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	1034.	mg/l
Bicarbonate as CaCO3	1034	mg/l
Calcium, dissolved	53.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	2440.	mg/l
Hardness as CaCO3	280.	mg/l
Magnesium, dissolved	36.	mg/l
Nitrate as N, dissolved	1.31	mg/l
Nitrate/Nitrite as N	1.31	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Potassium, dissolved	12.	mg/l
Sodium, dissolved	3040.	mg/l
Sulfate	3136.	mg/l
Cations (sum)	139.67	meq/l
Anions (sum)	154.86	meq/l
Cation-Anion Balance	-5.16	%
Solids, total dissolved	8632.	mg/l
Iron, dissolved	-0.1	mg/l
Manganese, dissolved	-0.05	mg/l

Remarks:

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: Spring #10 Lab No. : 93-WI/12142
Sample Date Time: 11/30/93 12:43 Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	510.	mg/l
Bicarbonate as CaCO3	510	mg/l
Calcium, dissolved	24.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	30.	mg/l
Hardness as CaCO3	154.	mg/l
Magnesium, dissolved	23.	mg/l
Nitrate as N, dissolved	-.02	mg/l
Nitrate/Nitrite as N	-0.02	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Potassium, dissolved	3.	mg/l
Sodium, dissolved	181.	mg/l
Sulfate	35.	mg/l
Cations (sum)	11.13	meq/l
Anions (sum)	11.77	meq/l
Cation-Anion Balance	-2.79	%
Solids, total dissolved	582.	mg/l
Iron, dissolved	-0.02	mg/l
Manganese, dissolved	-0.01	mg/l

Remarks:

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project :

Sample ID: G-5 Lab No. : 93-WI/12147
Sample Date Time: 11/30/93 16:57 Date Received: 12/06/93

Parameters

Alkalinity as CaCO3	450.	mg/l
Bicarbonate as CaCO3	450	mg/l
Calcium, dissolved	44.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	43.	mg/l
Hardness as CaCO3	278.	mg/l
Magnesium, dissolved	41.	mg/l
Nitrate as N, dissolved	0.36	mg/l
Nitrate/Nitrite as N	0.36	mg/l
Nitrite as N, dissolved	-0.01	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	6.	mg/l
Sodium, dissolved	149.	mg/l
Sulfate	129.	mg/l
Cations (sum)	12.27	meq/l
Anions (sum)	12.91	meq/l
Cation-Anion Balance	-2.54	%
Solids, total dissolved	686.	mg/l
Solids, total suspended	10.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	-0.02	mg/l
Manganese, dissolved	0.01	mg/l

Remarks:

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

NO METEOROLOGIC DATA ARE TAKEN ON-SITE AT SOLDIER CREEK COAL COMPANY. INFORMATION USED IN THE CLIMATOLOGIC REPORTS ARE EXTRAPOLATED FROM THE NOAA STATION AT SUNNYSIDE.

A COPY OF THE EMISSIONS INVENTORY IS ATTACHED. THIS REPORT IS SUBMITTED IN COMPLIANCE WITH THE REQUIREMMENT CONTAINED IN VOLUME 1, SECTION 4, OF THE MINING AND RECLAMATION PLAN.

ENVIRONMENTAL INDUSTRIAL SERVICES
4855 N. Spring Glen Rd., Helper, UT 84526 · Telephone (801) 472-3814 · FAX (801) 472-8780

March 24, 1994

MAR 28 1994

Mr. Tom Paluso
Soldier Creek Coal Co.
P.O. Box 1029
Wellington, Ut. 84542

Re: Visual Emissions
Soldier Creek Mine &
Banning Loadout

Dear Mr. Paluso:

Please find attached my evaluation of each potential source for ambiant dust and/or particulate matter associated with the Soldier Creek Mine and Banning Loadout facility.

Based on my evaluation given current weather and loading conditions, I could not identify any potential problems.

If you have any questions or concerns, please call me at (801) 472-3814.

Certification Date 8/27/81

Sincerely,

Melvin A. Coonrod
V.P. E.I.S.

MC/njc

FUGITIVE DUST

DATE 12/30/93 FIRM NAME Solier Creek Coal Co. PLANT LOCATION Carbon T13S, R12E

MAILING ADDRESS P.O. Box I, Price, UT 84501

FORM 11 Does Not Apply

Roads	Type [See Code]	Vehicle Miles Traveled	Average Vehicle Speed [MPH]	Control of Dust		Ext. Emmisions [Tons Per Year]	% Annual Road Usage			
				Method	Applications Per Year		Winter	Spring	Summer	Fall

Road Type Code: 1 - Dirt; 2 - Gravel; 3 - Paved

Tonnage Piles
(Omit if not Applicable)

Pile Location

Type Of Material Stored	Average Amount Storage Tons/Year	Annual Thru Put Tons/Yr.	Sieve Analysis/ Sizing Description	Content of Material		Type of Control Dust Emissions	Ext.Emissions Tons/Year		% Annual Thru Put Of Storage Piles			
				% Moisture	% Silt		TSP	PM10	W	Sp	Su	F
Coal	1000	456,806	6" minus	6.9		None	N/A		35	27	24	14

FUGITIVE DUST

DATE 12/30/93 FIRM NAME Banning Train Load Out PLANT LOCATION Carbon

MAILING ADDRESS

FORM 11

Roads	Type [See Code]	Vehicle Miles Traveled	Average Vehicle Speed [MPH]	Control of Dust		Ext. Emmisions [Tons Per Year]	% Annual Road Usage			
				Method	Applications Per Year		Winter	Spring	Summer	Fall

Road Type Code: 1 - Dirt; 2 - Gravel; 3 - Paved

Tonnage Piles
(Omit if not Applicable)

Pile Location

Type Of Material Stored	Average Amount Storage Tons/Year	Annual Thru Put Tons/Yr.	Sieve Analysis/ Sizing Description	Content of Material		Type of Control Dust Emissions	Ext.Emissions Tons/Year		% Annual Thru Put Of Storage Piles			
				% Moistue	% Silt		TSP	PM10	W	Sp	Su	F
Coal	143,026	434,711	2" X 0"	6.3	---	None	.087	.04	31	24	25	20

CALCULATIONS

FORM 11 - BANNING LOADOUT

$$TSP - .087 = .74\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (143{,}026)\ /\ 2000$$

$$PM10 - .04 = .35\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (143{,}026)\ /\ 2000$$

FORM 12

DATE 12/30/94 FIRM NAME Banning Train Load Out PLANT LOCATION Carbon County

MAILING ADDRESS 5250 South 300 West #200 Salt Lake City, Utah 84107

Mobile Sources	No. Of Vehicles	Tons Of Material Moved Or Processed Per Hour	Type Of Material	Emission Controls		Usage [Hrs/Year]		Emission [Tons/Year]					
				Type Of Fugitive Dust Controls	No. Of Applications Per Year	Gasoline Powered	Diesel Powered	PM10	Engine				
									TSP	SO_x	NO_x	HC	CO
Scraper													
Front End Loader			Coal	None	None	---	190	.07	.016	.017	.180	.024	.054
Shovel													
Bottom Dump Truck													
End Dump Truck													
Dragline													
Grader													
Buldozer Track type			Coal	None	None	---	95	.04	.007	.007	.080	.007	.032
Wheeled Dozers			Coal	None	None	---	95	.04	.008	.017	.198	.009	.085
Tractors													
Rollers													
Others (Specify]													

CALCULATIONS

FORM 12 - BANNING LOADOUT

Calculations for Front End Loader:

CO
.572 x HRS 190 / 2000 = .0543

HC
.25 x 190 / 2000 = .024

NO_x
1.89 x 190 / 2000 = .1796

SO_x
.82 x 190 / 2000 = .0173

TSP
.172 x 190 / 2000 = .0163

PM10
.04 / .55 = .07

Calculations for Wheeled Dozer:

CO
1.79 x 95 / 2000 = .0850

HC
.192 x 95 / 2000 = .0091

NO_x
4.166 x 95 / 2000 = .1979

SO_x
.348 x 95 / 2000 = .0165

TSP
.165 x 95 / 2000 = .0078

PM10
.02 / .55 = .04

CALCULATIONS FORM 12 (CONTINUED)

Calculations for Bulldozer (Track Type):

CO
.675 x 95 / 2000 = .0321

HC
.152 x 95 / 2000 = .0072

NO_x
1.691 x 95 / 2000 = .0803

SO_x
.143 x 95 / 2000 = .0067

TSP
.139 x 95 / 2000 = .0066

PM10
.02 / 55 = .04

FORM 5

DATE 12/30/93 FIRM NAME Soldier Creek Coal Co. PLANT LOCATION Carbon County, Utah T13S, R12E
12 Miles NE of Wellington, UT
Soldier Creek Road

MAILING ADDRESS 5250 S 300 W Suite 200 SLC, Utah 84107

Fugitive Emission Source Description [be specific]	Materials Used			Operating Time	Production Units Per Hour		Pollutants [Tons/Year]						% Annual Production			
	Type	% Moisture Content	Quantity Units/Yr	No. Hrs Per Year	Design Rate	Average Actual Rate	TSP	SO_x	NO_x	HC	CO	PM10	W	Sp	Su	Fa
#1 Conveyor belt [330 ft. covered]	Coal	6.9	456,806	1305	1,000	350	.277					.131	35	27	24	14
#2 Conveyor belt [100 ft. un-covered]	Coal	6.9	456,806	1305	1,000	350	.277					.131	35	27	24	14
Loadout Bin [No controls]	Coal	6.9	456,806	1305	1,000	350	.277					.131	35	27	24	14

CALCULATIONS

FORM 5 - SOLDIER CREEK MINE

Calculations for Conveyors and Loadout Bin:

$$\text{TSP} \quad .277 = .74(.0032) \frac{(8.7/5)^{1.3}}{(6.9/2)^{1.4}} (456{,}806)/2000$$

$$\text{PM10} \quad .131 = .35(.0032) \frac{(8.7/5)^{1.3}}{(6.9/2)^{1.4}} (456{,}806)/2000$$

FORM 5

DATE 12/30/93 FIRM NAME Banning Train Loadout PLANT LOCATION U.S. Highway 6-50 near Sunnyside Junction

MAILING ADDRESS 5250 S. 300 W. Suite 200 SLC, UT 84107

Fugitive Emission Source Description [be specific]	Materials Used			Operating Time	Production Units Per Hour		Pollutants [Tons/Year]						% Annual Production			
	Type	% Moisture Content	Quantity Units/Yr	No. Hrs Per Year	Design Rate	Average Actual Rate	TSP	SO_x	NO_x	HC	CO	PM10	W	Sp	Su	Fa
Truck Hopper [Water Spray]	Coal	6.3	.4347	1359	400	320	.264					.125	35	27	24	14
Hopper Belt	Coal	6.3	.4347	1359	400	320	.264					.125	35	27	24	14
Crusher [Covered & water Spray]	Coal	6.3	.4347	1359	400	320	.100					.006	35	27	24	14
Radial Stacker [Water spray]	Coal	6.3	.4347	1359	400	320	.264					.125	35	27	24	14
Reclaim Belt	Coal	6.3	.4347	290	3,000	1,500	.264					.125	31	24	25	20
Train Car Load-Out Bin [Water spray]	Coal	6.3	.4347	290	3,000	1,500	.264					.125	31	24	25	20

CALCULATIONS

FORM 5 - BANNING LOADOUT

Calculations for Truck Hopper, Hopper Belt, Radial Stacker:

$$\text{TSP} - .264 = .74\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (434{,}711)\ /\ 2000$$

$$\text{PM10} - .125 = .35\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (434{,}711)\ /\ 2000$$

Calculations for Crusher:

$$\text{TSP} - .100 = .28\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (434{,}711)\ /\ 2000$$

$$\text{PM10} - .006 = .017\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (434{,}711)\ /\ 2000$$

Calculations for Reclaim Belt, Train Car Load Out Bin:

$$\text{TSP} - .264 = .74\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (434{,}711)\ /\ 2000$$

$$\text{PM10} - .125 = .35\ (.0032)\ \frac{(8.7/5)\ 1.3}{(6.3/2)\ 1.4}\ (434{,}711)\ /\ 2000$$

VISUAL EMISSIONS FIELD SHEET

Property Laidlaw Truck Mixer Date 8/4/93

Location Mine Yard.

Source Closed Conveyor

Background Description P.E. Hill side

Weather Conditions:

Wind Speed 2-6 8 Wind Direction South

Ambiant Temp. 64 Rel. Humidity 90+

Change in Weather Rain

Angle of the Sun cls - (AM Shadow)

Observed Reading 14

(>10 to 100%)

Comments Small dust plume at transfer point -

Inspector M. Coomoe

Certification Date 8/22/91

VISUAL EMISSIONS FIELD SHEET

Property Solidus Rock Mine Date 10/4/93

Location Mine yard

Source Open Conveyor Belt

Background Description P.J. - Hillside

Weather Conditions:

Wind Speed 6 to 8 Wind Direction South

Ambiant Temp. 64 Rel. Humidity 89%

Change in Weather Rain

Angle of the Sun N/A

Observed Reading > 10

(>10 to 100%)

Comments

Inspector [signature]

Certification Date 8/22/91

VISUAL EMISSIONS FIELD SHEET

Property Leitchfield Creek Mine Date 10/4/93

Location Mine yard.

Source Load out Bin

Background Description Pit Hillside Crags to Green

Weather Conditions:

Wind Speed 8 Wind Direction South

Ambiant Temp. 64 Rel. Humidity 90%

Change in Weather Rain

Angle of the Sun Overcast

Observed Reading >10

(>10 to 100%)

Comments

Inspector J. A. Loonsoe

Certification Date 8/12/93

VISUAL EMISSIONS FIELD SHEET

Property Bunning Date 10/8/93

Location Hwy 50 & Pennyside

Source Truck Hopper

Background Description Greasewood - Sage - Gray hills.

Weather Conditions:

Wind Speed 5 to 7 Wind Direction N-NWest

Ambiant Temp. 68 Rel. Humidity 34

Change in Weather Light Sprinkle

Angle of the Sun (UK) overcast - est - 90%

Observed Reading 12

(>10 to 100%)

Comments

Inspector [signature]

Certification Date 8/22/81

VISUAL EMISSIONS FIELD SHEET

Property Bunnings Date 10/8/93

Location Hwy 50 & Bunnyside Road.

Source Hopper Belt.

Background Description Natural Cloud Cover

Weather Conditions:

Wind Speed > 3 mph Wind Direction N-to NWest

Ambiant Temp. 71 Rel. Humidity 30

Change in Weather AM Showers

Angle of the Sun 45% S. West.

Observed Reading > 10

(>10 to 100%)

Comments Covered Conveyor - short run time no visible dust.

Inspector [signature]

Certification Date 8/22/81

VISUAL EMISSIONS FIELD SHEET

Property Banning Date 10/8/93

Location Hwy 50 & Sunnyside Jund.

Source Crusher

Background Description Coal Pile - Overcast Sky

Weather Conditions:

Wind Speed >3 Wind Direction N by NE

Ambiant Temp. 74 Rel. Humidity 38

Change in Weather AM Showers

Angle of the Sun 45% South west

Observed Reading >10

(>10 to 100%)

Comments Coal Dust largely condensed - minor emission on disp.

Inspector [signature]

Certification Date 8/22/81

VISUAL EMISSIONS FIELD SHEET

Property Banning Date 10/8/94

Location Junction - Hwy 50-6 - Sunnyside

Source Car Load Out

Background Description Overcast - Partial Cloud Cover

Weather Conditions:

Wind Speed Neg Wind Direction Neg

Ambiant Temp. 74° Rel. Humidity 24

Change in Weather Storm AM - Partial Clearing

Angle of the Sun 45° - South West.

Observed Reading >10

(>10 to 100%)

Comments

Inspector [signature]

Certification Date 8/22/91

Utah State
Division of Environmental Health

Awards This Certificate To

M.A. COONROD

For Successfully Completing The

Visible Emissions Evaluation Course

Conducted By

The Bureau of Air Quality

Alvin E. Pickers
Director, Division of Environmental Health

Director, Bureau of Air Quality

Date August 27, 1981

OCTOBER 15, 1993

DAVID SPILLMAN
COASTAL STATES CORPORATION
SOLDIER CANYON MINE
P.O. BOX I
PRICE, UTAH 84501

OCT 20 1993

Dear Dave,

Enclosed please find the results of our 1993 Subsidence Monitoring Survey and an invoice for work performed.

I found two errors on the computer print out of our survey. The first is on point N0. 91-1 SS, the SDR automatically brings up the last point surveyed for the backsight on the next point and I inadvertently entered that backsight so the coordinates for point 91-1 SS on the print out are incorrect. The second error was on point No. 15 SS. Kevin forgot his tape measure to measure his Target Height on this shot so I assumed it was the same as the last shot to save time and then would correct it later. The table enclosed shows the corrected results for both points.

As per our previous phone conversation, I am not sending anything on the Banning Survey, but if you have any questions, please feel free to call.

We did not receive a P.O. for this job as we never submitted a new bid so if there is anything we need to do, please let me know. My Tax I.D. # is 87-0475922.

We appreciate the opportunity to work for you and hope we can continue to do so in the future.

INCLS: as

Sincerely,

Barry L. Prettyman

BARRY L. PRETTYMAN
R.L.S. # 6711

SOLDIER CRE_ COAL COMPANY
1993 SUBSIDENCE MONITORING SURVEY

POINT NO.	NORTHING	EASTING	ELEVATION	COMMENTS
53 SS	105,669.434	44,483.229	8142.40	
91-1SS	104,848.515	44,564.932	7840.74	
92-1SS	103,218.282	43,526.100	7816.47	
113-SS	102,787.432	44,216.366	7755.81	
93-1SS	101,962.333	44206.549	7734.21	NEW POINT SET THIS YEAR
93-2SS	101,119.877	44,511.320	7739.36	NEW POINT SET THIS YEAR
112-SS	100,663.936	44,629.354	7691.60	OLD POINT RESURVEYED FOR SUBSIDENCE MONITORING
92-3SS	106,594.026	52,863.738	6989.61	NEW POINT SET TO REPLACE POINT 101 WHICH WAS DESTROYED BY CONSTRUCTION @ MOUTH PINE CANYON
15-SS	99,262.812	51,474.549	6877.07	
87-0SS	100,460.512	51,558.323	6776.04	
87-1SS	101,584.967	52,049.836	6873.91	
106-SS	102,618.016	52,214.516	6863.98	
3044	103,268.112	52,399.694	6931.14	
36-SS	104,940.686	52,460.252	6999.78	
87-47SS	102,402.718	55,047.935	7479.99	
92-2SS	103,573,887	54,788.154	7802.73	
3046	104,115.719	55,479.578	8052.31	

VEGETATION AND SOIL ANALYSES

The following vegetation and soils information was conducted on the Banning Test Plot in accordance to Appendix 3-4.

10/93

BANNING TEST PLOTS FORAGE PRODUCTION & GROUND COVER

Test Plot #1			Sawdust & Fertilizer - Main
Hycrest Crested Wheatgrass	(AGCR)		300 lb/acres
Kochia	(KOAM)		400 lbs/acre
		Total	700 lbs/acres

Ground Cover	
Bare Soil	60%
Vegetation	5%
Litter	35%

Test Pilot #2			Control Main
Hycrest Crested Wheatgrass	(AGCR)		200 lbs/acre
Kochia	(KOAM)		500 lbs/acre
		Total	700 lbs/acre

Ground Cover	
Bare Soil	50%
Vegetation	3%
Litter	47%

Test Plot #3		Fertilizer Main
Kochia	(KOAM)	750 lbs/acre

Groud Cover	
Bare Soil	50%
Vegetation	12%
Litter	38%

Test Plot #4			Manure Main
Kochia	(KOAM)		120 lbs/acre
Atriplex confertifolia			20 lbs/acre
		Total	140 lbs/acre

Ground Cover	
Bare Soil	40%
Vegetation	3%
Litter	57%

10/93

Test Plot #5			Blank (Control)
Kochia	(KOAM)		90 lbs/acre
Atriplet Confertifolia	(ATCA)		50 lbs/acre
		Total	140 lbs/acre

Ground Cover	
Bare Soil	40%
Vegetation	3%
Litter	57%

Test Plot #6			Sawdust & Fertilizer Supplemental
Kochia	(KOAM)		420 lbs/acre
Atriplex Confertifolio	(ATCO)		50 lbs/acre
		Totla	470 lbs/acre

Ground Cover	
Bare Soil	60%
Vegetation	5%
Litter	35%

Test Plot #7		Fertilizer Supplemental
Kochia	(KOAM)	270 lbs/acre

Ground Cover	
Bare Soil	10%
Vegetation	3%
Litter	87%

Teat Plot #8		Manure Supplemental
Kochia	(KOAM)	270 lbs/acre

Ground Cover	
Bare Soil	40%
Vegetation	3%
Litter	57%

Test Plot #9			Control Supplemental
Kochia	(KOAM)		180 lbs/acre
Atriplex Confertifolia	(ATCO)		45 lbs/acre
		Total	225 lbs/acre

Ground Cover	
Bare Soil	20%
Vegetation	3%
Litter	77%

Test Plot #10 — Blank (Control)

Kochia	(KOAM)	450 lbs/acre

Ground Cover

Bare Soil	10%
Vegetation	8%
Litter	82%

Test Plot #11 — Sawdust & Fertilizer Main

Kochia	(KOAM)	240 lbs/acre

Ground Cover

Bare Soil	70%
Vegetation	3%
Litter	27%

Test Plot #12 — Control Main

Kochia	(KOAM)	90 lbs/acre

Ground Cover

Bare Soil	88%
Vegetation	2%
Litter	10%

Test Plot #13 — Fertilizer Main

Kochia	(KOAM)	520 lbs/acre
Atriplex convertfolia	(ATCA)	120 lbs/acre
	Total	640 lbs/acre

Ground Cover

Bare Soil	60%
Vegetation	8%
Litter	32%

Test Plot #14 — Manure Main

Kochia	(KOAM)	300 lbs/acre
Crested Wheatgrass	(AGCR)	200 lbs/acre
	Total	500 lbs/acre

Ground Cover

Bare Soil	40%
Vegetation	6%
Litter	54%

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Sawdust & Fertilization Main (1&11) Lab No. : 93-SI/02311
Sample Date Time: unknown Date Received: 12/06/93

Parameters

pH, saturated paste	7.9	units	1
Conductivity, sat. paste	6.98	mmhos/cm	1
Calcium, soluble	18.81	meq/l	1
Magnesium, soluble	17.03	meq/l	1
Sodium, soluble	25.01	meq/l	1
Sodium Absorption Ratio	5.9		
Nitrate as N, soluble	190	mg/kg	6
Phosphorus, extractable	81.0	mg/kg	3
Boron, soluble	5.90	mg/kg	2
Copper, extractable	1.3	mg/kg	3
Iron, extractable	22.1	mg/kg	3
Manganese, extractable	12.0	mg/kg	3
Potassium, extractable	2040.	mg/kg	3
Zinc, extractable	5.7	mg/kg	3
Sand 2.00 - .062 mm	46	%	
Silt .062 - .002 mm	38	%	
Clay -.002 mm	16	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Control Main (2&12)
Sample Date Time: unknown

Lab No. : 93-SI/02312
Date Received: 12/06/93

Parameters

pH, saturated paste	8.4	units	1
Conductivity, sat. paste	4.45	mmhos/cm	1
Calcium, soluble	15.62	meq/l	1
Magnesium, soluble	8.39	meq/l	1
Sodium, soluble	36.15	meq/l	1
Sodium Absorption Ratio	10.4		
Nitrate as N, soluble	8.4	mg/kg	6
Phosphorus, extractable	4.0	mg/kg	3
Boron, soluble	3.91	mg/kg	2
Copper, extractable	1.3	mg/kg	3
Iron, extractable	5.2	mg/kg	3
Manganese, extractable	1.2	mg/kg	3
Potassium, extractable	259.	mg/kg	3
Zinc, extractable	0.3	mg/kg	3
Sand 2.00 - .062 mm	39	%	
Silt .062 - .002 mm	42	%	
Clay -.002 mm	19	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Fertilizer Main (3&13)
Sample Date Time: unknown

Lab No. : 93-SI/02313
Date Received: 12/06/93

Parameters

pH, saturated paste	8.5	units	1
Conductivity, sat. paste	9.44	mmhos/cm	1
Calcium, soluble	15.8	meq/l	1
Magnesium, soluble	15.4	meq/l	1
Sodium, soluble	103.1	meq/l	1
Sodium Absorption Ratio	26.1		
Nitrate as N, soluble	1.7	mg/kg	6
Phosphorus, extractable	6.0	mg/kg	3
Boron, soluble	3.26	mg/kg	2
Copper, extractable	1.4	mg/kg	3
Iron, extractable	5.6	mg/kg	3
Manganese, extractable	1.8	mg/kg	3
Potassium, extractable	344.	mg/kg	3
Zinc, extractable	0.5	mg/kg	3
Sand 2.00 - .062 mm	30	%	
Silt .062 - .002 mm	47	%	
Clay -.002 mm	23	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Manure Main (4&14)
Sample Date Time: unknown

Lab No. : 93-SI/02314
Date Received: 12/06/93

Parameters

pH, saturated paste	8.5	units	1
Conductivity, sat. paste	7.05	mmhos/cm	1
Calcium, soluble	16.6	meq/l	1
Magnesium, soluble	14.2	meq/l	1
Sodium, soluble	64.8	meq/l	1
Sodium Absorption Ratio	16.5		
Nitrate as N, soluble	12.6	mg/kg	6
Phosphorus, extractable	11.0	mg/kg	3
Boron, soluble	5.35	mg/kg	2
Copper, extractable	1.7	mg/kg	3
Iron, extractable	15.9	mg/kg	3
Manganese, extractable	1.4	mg/kg	3
Potassium, extractable	424.	mg/kg	3
Zinc, extractable	0.5	mg/kg	3
Sand 2.00 - .062 mm	38	%	
Silt .062 - .002 mm	47	%	
Clay -.002 mm	15	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/

Client : Soldier Creek Coal Company
^ddress : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Blank (5&10)
Sample Date Time: unknown

Lab No. : 93-SI/02315
Date Received: 12/06/93

Parameters

pH, saturated paste	8.0	units	1
Conductivity, sat. paste	4.24	mmhos/cm	1
Calcium, soluble	17.56	meq/l	1
Magnesium, soluble	18.43	meq/l	1
Sodium, soluble	24.75	meq/l	1
Sodium Absorption Ratio	5.8		
Nitrate as N, soluble	0.5	mg/kg	6
Phosphorus, extractable	5.0	mg/kg	3
Boron, soluble	4.40	mg/kg	2
Copper, extractable	0.9	mg/kg	3
Iron, extractable	4.3	mg/kg	3
Manganese, extractable	2.1	mg/kg	3
Potassium, extractable	241.	mg/kg	3
Zinc, extractable	0.9	mg/kg	3
Sand 2.00 - .062 mm	44	%	
Silt .062 - .002 mm	43	%	
Clay -.002 mm	13	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Sawdust & Fert. Suppl. (6)
Sample Date Time: unknown

Lab No. : 93-SI/02316
Date Received: 12/06/93

Parameters

pH, saturated paste	8.1	units	1
Conductivity, sat. paste	2.85	mmhos/cm	1
Calcium, soluble	20.46	meq/l	1
Magnesium, soluble	11.77	meq/l	1
Sodium, soluble	10.35	meq/l	1
Sodium Absorption Ratio	2.6		
Nitrate as N, soluble	10.9	mg/kg	6
Phosphorus, extractable	6.0	mg/kg	3
Boron, soluble	3.80	mg/kg	2
Copper, extractable	1.0	mg/kg	3
Iron, extractable	4.6	mg/kg	3
Manganese, extractable	1.4	mg/kg	3
Potassium, extractable	164.	mg/kg	3
Zinc, extractable	0.6	mg/kg	3
Sand 2.00 - .062 mm	49	%	
Silt .062 - .002 mm	38	%	
Clay -.002 mm	13	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/SH.

Frank E. Palniak, Inorganic Laboratory Supervisor/FP

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Fertilizer Supplement
Sample Date Time: unknown

Lab No. : 93-SI/02317
Date Received: 12/06/93

Parameters

pH, saturated paste	7.8	units	1
Conductivity, sat. paste	7.23	mmhos/cm	1
Calcium, soluble	19.26	meq/l	1
Magnesium, soluble	19.67	meq/l	1
Sodium, soluble	19.01	meq/l	1
Sodium Absorption Ratio	4.3		
Nitrate as N, soluble	400	mg/kg	6
Phosphorus, extractable	69.0	mg/kg	3
Boron, soluble	5.45	mg/kg	2
Copper, extractable	1.2	mg/kg	3
Iron, extractable	22.5	mg/kg	3
Manganese, extractable	16.7	mg/kg	3
Potassium, extractable	2160.	mg/kg	3
Zinc, extractable	5.3	mg/kg	3
Sand 2.00 - .062 mm	51	%	
Silt .062 - .002 mm	35	%	
Clay -.002 mm	14	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Manure Supplement (8) Lab No. : 93-SI/02318
Sample Date Time: unknown Date Received: 12/06/93

Parameters

pH, saturated paste	7.7	units	1
Conductivity, sat. paste	4.20	mmhos/cm	1
Calcium, soluble	19.11	meq/l	1
Magnesium, soluble	20.32	meq/l	1
Sodium, soluble	23.23	meq/l	1
Sodium Absorption Ratio	5.2		
Nitrate as N, soluble	-0.1	mg/kg	6
Phosphorus, extractable	28.0	mg/kg	3
Boron, soluble	5.20	mg/kg	2
Copper, extractable	1.0	mg/kg	3
Iron, extractable	5.8	mg/kg	3
Manganese, extractable	8.0	mg/kg	3
Potassium, extractable	380.	mg/kg	3
Zinc, extractable	2.6	mg/kg	3
Sand 2.00 - .062 mm	49	%	
Silt .062 - .002 mm	38	%	
Clay -.002 mm	13	%	
Texture	L		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/S.H.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

ACZ LABORATORIES
30400 Downhill Drive
Steamboat Springs, CO 80487

Colorado State University
Soil, Water & Plant Testing Laboratory
Room 6, Vocational Education Building
Fort Collins, CO 80523
303-491-5061
DATE: 01/05/94
BILLING: 515748

DATE RECEIVED: 12/10/93

RESEARCH SOIL ANALYSIS

Lab #	Sample ID #	Available Water Capacity* cm cm^{-1}	---% H_2O---- 1/3 Bar	15 Bar	Bulk Density g/cm^3
R 4329	93 – SI / 2311	0.02	33.5	31.5	1.07
4330	93 – SI / 2312	0.05	14.6	9.5	1.05
4331	93 – SI / 2313	0.08	18.0	11.9	1.32
4332	93 – SI / 2314	0.08	14.4	9.3	1.55
4333	93 – SI / 2315	0.09	16.0	10.2	1.53
4334	93 – SI / 2316	0.07	14.3	9.2	1.32
4335	93 – SI / 2317	0.05	18.4	14.7	1.43
4336	93 – SI / 2318	0.06	19.3	13.9	1.03
4337	93 – SI / 2319	0.07	15.6	9.7	1.22
Duplicate					
4331d	93 – SI / 2313	0.08	18.3	11.8	1.30

* Available water capacity is estimated by the water retention difference (WRD) and is reported as centimeters of water per centimeter of depth of soil (cm cm^{-1}). Method 4C pp 184 of Soil Survey Laboratory Methods Manuel. Soil Survey Investigations Report No. 42, Version 1.0, October, 1991.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Tom Paluso
Project : PO# 4113
Sample Matrix: SOIL
Sample ID: Control Supplement (9)
Sample Date Time: unknown

Lab No. : 93-SI/02319
Date Received: 12/06/93

Parameters

pH, saturated paste	8.4	units	1
Conductivity, sat. paste	4.67	mmhos/cm	1
Calcium, soluble	18.86	meq/l	1
Magnesium, soluble	18.27	meq/l	1
Sodium, soluble	31.27	meq/l	1
Sodium Absorption Ratio	7.3		
Nitrate as N, soluble	3.4	mg/kg	6
Phosphorus, extractable	4.0	mg/kg	3
Boron, soluble	4.68	mg/kg	2
Copper, extractable	1.5	mg/kg	3
Iron, extractable	6.5	mg/kg	3
Manganese, extractable	1.4	mg/kg	3
Potassium, extractable	255.	mg/kg	3
Zinc, extractable	0.6	mg/kg	3
Sand 2.00 - .062 mm	28	%	
Silt .062 - .002 mm	51	%	
Clay -.002 mm	21	%	
Texture	SiL		

1 Saturated Paste Extraction
2 Hot Water Extraction
3 AB-DTPA Extraction
6 Water Extraction

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

Scott Habermehl, Project Manager/SH.

Frank E. Polniak, Inorganic Laboratory Supervisor/FP

YEARLY CERTIFIED POND INSPECTION
SOLDIER CREEK COAL COMPANY

POND BEING INSPECTED: Banning Sedimentation Pond

DATE OF INSPECTION: August 9, 1993

PERSON(S) MAKING INSPECTION: J. T. Paluso

THIS IMPOUNDMENT HAS BEEN CONSTRUCTED AND MAINTAINED AS DESIGNED AND IN ACCORDANCE WITH THE APPROVED PLAN AND THE R645 RULES. NO MONITORING OR INSTRUMENTATION IS REQUIRED AT THIS TIME.

DEPTH AND ELEVATION OF ANY IMPOUNDED WATER: Pond is dry

STORAGE CAPACITY: 1.45 Acre-feet EXISTING CAPACITY: 1.45 Acre-feet

ANY STRUCTURAL WEAKNESS, SIGNS OF INSTABILITY, EROSION AND OTHER HAZARDOUS CONDITIONS NOTED: None observed

ANY ROUTINE MAINTENANCE REQUIRED: None required

COMMENTS: Elevation of spillway is 5495.2'

APPROVAL: J. T. Paluso

Registered Professional Engineer
No. 4028
8/12/93
J. THOMAS PALUSO
State of Utah

DATE: 08/12/93

YEARLY CERTIFIED POND INSPECTION
SOLDIER CREEK COAL COMPANY

POND BEING INSPECTED: Mine Sedimentation Pond

DATE OF INSPECTION: August 9, 1993

PERSON(S) MAKING INSPECTION: J. T. Paluso

THIS IMPOUNDMENT HAS BEEN CONSTRUCTED AND MAINTAINED AS DESIGNED AND IN ACCORDANCE WITH THE APPROVED PLAN AND THE R645 RULES. NO MONITORING OR INSTRUMENTATION IS REQUIRED AT THIS TIME.

DEPTH AND ELEVATION OF ANY IMPOUNDED WATER: Approximately 1'

STORAGE CAPACITY: 3.3 Acre-feet EXISTING CAPACITY: 2.42 Acre-feet

ANY STRUCTURAL WEAKNESS, SIGNS OF INSTABILITY, EROSION AND OTHER HAZARDOUS CONDITIONS NOTED: None observed

ANY ROUTINE MAINTENANCE REQUIRED: None required

COMMENTS: Water elevation was 2' below decant. Elevation of decant is 6649.5'

APPROVAL: J. T. Paluso

Registered Professional Engineer
No. 4026
J. THOMAS PALUSO
State of Utah

DATE: 08/12/93

YEARLY CERTIFIED POND INSPECTION
SOLDIER CREEK COAL COMPANY

POND BEING INSPECTED: Sewage Lagoon

DATE OF INSPECTION: August 9, 1993

PERSON(S) MAKING INSPECTION: J. T. Paluso

THIS IMPOUNDMENT HAS BEEN CONSTRUCTED AND MAINTAINED AS DESIGNED AND IN ACCORDANCE WITH THE APPROVED PLAN AND THE R645 RULES. NO MONITORING OR INSTRUMENTATION IS REQUIRED AT THIS TIME.

DEPTH AND ELEVATION OF ANY IMPOUNDED WATER: Approximately 4' from top of dike.

STORAGE CAPACITY: 2.1 Acre-feet EXISTING CAPACITY: 2.1 Acre-feet

ANY STRUCTURAL WEAKNESS, SIGNS OF INSTABILITY, EROSION AND OTHER HAZARDOUS CONDITIONS NOTED: None observed

ANY ROUTINE MAINTENANCE REQUIRED: Weeds on the cell tops should be cut.

COMMENTS: None

APPROVAL: J. T. Paluso DATE: 08/12/93

Registered Professional Engineer
No. 4028
8/12/93
J. THOMAS PALUSO
State of Utah

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL: 708-953-9300 FAX: 708-953-9306

ICE 1908

Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

August 16, 1993

SOLDIER CREEK COAL CO.
P.O. Box I
Price UT 84501

Sample identification by
SOLDIER CREEK COAL CO.

Kind of sample reported to us	Coal	Quarterly Train Composite
		April, May & June 1993
Sample taken at	Banning Rail Site	41,153.9 Tons
		12.75 lbs.
Sample taken by	CT&E	1 Bag
Date sampled	------	
Date received	July 8, 1993	

Analysis report no. 59-161665

TRACE ELEMENTS, WATER EXTRACTABLE

Arsenic, As	<0.02 ppb	**Lead, Pb**	<0.05 ppb
Barium, Ba	0.37 ppb	**Mercury, Hg**	<0.0002 ppb
Boron, B	0.02 ppb	**Molybdenum, Mo**	<0.05 ppb
Cadmium, Cd	<0.01 ppb	**Selenium, Se**	<0.02 ppb
Copper, Cu	<0.01 ppb	**Zinc, Zn**	<0.01 ppb

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

COASTAL STATES ENERGY COMPANY

LIST OF CORPORATE OFFICERS

AN UPDATED LISTING OF CORPORATE OFFICERS AND CORPORATE STRUCTURE WAS SUBMITTED IN FEBRUARY 1994. AN APPROVAL OF THIS LISTING BY THE DIVISION IS PENDING.

AS PER A TELEPHONE CONVERSATION WITH DARON HADDOCK AND KEITH ZOBELL THE UNAPPROVED LIST WILL NOT BE REPEATED IN THIS ANNUAL REPORT.