



**Date:** June 19, 1998  
**Subject:** Dugout Canyon Water Monitoring  
**From:** Dave Spillman *DS*  
**To:** File

ACT/007/089 #7

Soldier Canyon personnel officially accepted responsibility for the Dugout Canyon water monitoring beginning during the first quarter of 1998. All previous water monitoring at Dugout had been completed by Keith Zobell, working initially as a Skyline employee and later as a consultant.

On March 30, 1998, Soldier Canyon personnel mistakenly sampled sites DC-4 and DC-5 rather than DC-2 and DC-3 on Dugout Creek. Sites DC-4 and DC-5 had previously been monitored by Zobell, however, the approved MRP only requires monitoring of these sites during one "wet" year and one "dry" year. Monitoring of sites DC-2 and DC-3 is required quarterly. This mistake was not discovered until April 21, 1998, during the initial preparation work on the quarterly report. This noncompliance issue was also reported to Ken Wyatt of DOGM that morning. Later that day, Steve Demczak telephoned me and indicated that he was issuing a NOV for failure to monitor in accordance with our approved MRP. I immediately contacted Joe Helfrich in order to discuss options to resolve this issue without enforcement action being taken. I informed Joe that we had implemented our Dugout water monitoring activities in 1997, prior to the issuance of the Phase 1 permit. The 1997 monitoring was intended as a goodwill gesture towards DOGM and we were in no way obligated to generate this information. I suggested that Joe discuss this matter with Jim Smith, since he was aware of this arrangement. I also pointed out that we had not initiated any construction or disturbance at the Dugout site. Joe said he would do some further checking and get back with me.

Steve Demczak called later in the afternoon and informed me that SLC DOGM had determined that a citation was not warranted in this situation. Furthermore, it was agreed upon that we would take one additional sample of DC-1, DC-2 & DC-3 during the second quarter. These samples were subsequently taken on April 27, 1998.

## DUGOUT CANYON MINE WATER MONITORING -MARCH 1998

### FIRST QUARTER RESULTS

<u>SURFACE WATER</u>	<u>Date</u>	<u>Flow (cfs)</u>	<u>Water Temp (deg C)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Dissolved O<sub>2</sub></u>
DC-1(G-11)	3/30/98	3.637	0.22	7.32	690	6
<b>**DC-1(G-11)</b>	4/27/98	9.477	4.67	8.11	680	8
<b>**DC-2(G-12)</b>	4/27/98	4.987	4.11	8.10	694	6
<b>**DC-3(G-13)</b>	4/27/98	2.285	4.28	8.09	487	5
DC-4(G-14)	3/30/98	.328	0.17	7.46	528	7
DC-5(G-15)	3/30/98	1.070	0.00	7.91	585	7

#### GROUND WATER

SC-14(14,S-14)	3/30/98	Inaccessible due to snow and mud
SP-20(20,S-20)	3/30/98	Inaccessible due to snow and mud
SC-65(65,S-65)	3/30/98	Inaccessible due to snow and mud
SC-100(100,S-100)	3/30/98	Inaccessible due to snow and mud

#### WELLS      DATE      DEPTH

GW-10-2(10-2)	3/26/98	732.0'
GW-11-2(11-2)	3/30/98	Inaccessible due to snow and mud
GW-24-1(24-1)	3/30/98	Inaccessible due to snow and mud

**\*\*NOTE:** Refer to attached letter dated June 19,1998.

NOTE: Identification numbers listed above which are bold represent the nomenclature used in the permits. Identification numbers in the parantheses represent nomenclature used in Mayo's report or other nomenclature used in the past.

ACT/002/039  
#7

# DUGOUT CANYON

# ANALYTICAL RESULTS

ACZ Laboratories, Inc.  
 30400 Downhill Drive  
 Steamboat Springs, CO 80487  
 (800) 334-5493

Lab Sample ID: **L17938-01**  
 Client Sample ID: **DC-1**  
 Client Project ID:  
 ACZ Report ID: **RG65703**

**APR 23 1998**

Soldier Creek Coal Company  
 P.O. Box 1029  
 Wellington, UT 84542  
 Dave Spillman

Date Sampled: **3/30/98 11:10**  
 Date Received: **4/1/98**  
 Date Reported: **4/16/98**

Sample Matrix: **Surface Water**

**Metals Analysis**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	62.1		mg/L	0.2	1	4/6/98	jaw
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	4/6/98	jaw
Iron, total	M200.7 ICP	1.44		mg/L	0.01	0.05	4/16/98	ss
Magnesium, dissolved	M200.7 ICP	41.8		mg/L	0.2	1	4/4/98	kr
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	4/4/98	kr
Manganese, total	M200.7 ICP	0.059		mg/L	0.005	0.03	4/14/98	kr
Potassium, dissolved	M200.7 ICP	1.8		mg/L	0.3	1	4/4/98	kr
Sodium, dissolved	M200.7 ICP	20.8		mg/L	0.3	1	4/4/98	kr

**Metals Prep**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010 ICP						4/13/98	laa

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M310.1							
Bicarbonate as CaCO3		288		mg/L	2	10	4/8/98	bk
Carbonate as CaCO3			U	mg/L	2	10	4/8/98	bk
Hydroxide as CaCO3			U	mg/L	2	10	4/8/98	bk
Total Alkalinity		288		mg/L	2	10	4/8/98	bk
Cation-Anion Balance	Calculation							
Cation-Anion Balance		0.0		%			4/16/98	calc
Sum of Anions		7.4		meq/L	0.1	0.5	4/16/98	calc
Sum of Cations		7.4		meq/L	0.1	0.5	4/16/98	calc
Chloride	M325.2 - Colorimetric (RFA)	6		mg/L	1	5	4/9/98	mh
Fluoride	M340.2 - ISE	0.3	B	mg/L	0.1	0.5	4/6/98	bk
Hardness as CaCO3	Calculation based on dissolved Ca & Mg	327		mg/L	1	7	4/16/98	calc
Nitrate as N, dissolved	M353.2 - Automated Cadmium Reduction	0.12		mg/L	0.02	0.1	4/1/98	ss
Nitrate/Nitrite as N, dissolved	M353.2 - Automated Cadmium Reduction	0.12		mg/L	0.02	0.1	4/1/98	ss
Nitrite as N, dissolved	M353.2 - Automated Cadmium Reduction		U	mg/L	0.01	0.05	4/1/98	ss
Oil & Grease, Total Recoverable	M413.1 - Gravimetric		U	mg/L	2	10	4/10/98	cj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	380		mg/L	10	20	4/3/98	bk
Residue, Non-Filterable (TSS) @103-5C	M160.2 - Gravimetric	84		mg/L	5	20	4/7/98	cj
Sodium Absorption Ratio in Water	USGS - I1738-78	0.50			0.03	0.15	4/16/98	calc
Sulfate	M375.3 - Gravimetric	70		mg/L	10	20	4/3/98	sts
TDS (calculated)	Calculation	376		mg/L	10	50	4/16/98	calc
TDS (ratio - measured/calculated)	Calculation	1.01					4/16/98	calc

**Inorganic Qualifiers (based on EPA CLP 3/90)**

U = Analyte was analyzed for but not detected at the indicated MDL  
 B = Analyte concentration detected at a value between MDL and PQL  
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
30400 Downhill Drive  
Steamboat Springs, CO 80487  
(800) 334-5493

Lab Sample ID: *L17938-01*  
Client Sample ID: *DC-1*  
Client Project ID:  
ACZ Report ID: *RG65703*

Soldier Creek Coal Company  
P.O. Box 1029  
Wellington, UT 84542  
Dave Spillman

Date Sampled: *3/30/98 11:10*  
Date Received: *4/1/98*  
Date Reported: *4/16/98*

Sample Matrix: *Surface Water*

---

**Note: Sample required re-analysis for TSS after the applicable holdtime had expired.**

**Inorganic Qualifiers (based on EPA CLP 3/90)**

U = Analyte was analyzed for but not detected at the indicated MDL

B = Analyte concentration detected at a value between MDL and PQL

PQL = Practical Quantitation Limit

*RVP*

---

Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
 30400 Downhill Drive  
 Steamboat Springs, CO 80487  
 (800) 334-5493

Lab Sample ID: **L18307-01**  
 Client Sample ID: **DC-1**  
 Client Project ID:  
 ACZ Report ID: **RG67341**

Soldier Creek Coal Company  
 P.O. Box 1029  
 Wellington, UT 84542  
 Dave Spillman

MAY 26 1998

Date Sampled: **4/27/98 12:40**  
 Date Received: **4/30/98**  
 Date Reported: **5/20/98**

Sample Matrix: *Surface Water*

### Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	62.3		mg/L	0.2	1	5/9/98	kr
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	5/9/98	kr
Iron, total	M200.7 ICP	3.13		mg/L	0.01	0.05	5/13/98	gg
Magnesium, dissolved	M200.7 ICP	43.1		mg/L	0.2	1	5/9/98	kr
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	5/9/98	kr
Manganese, total	M200.7 ICP	0.078		mg/L	0.005	0.03	5/13/98	gg
Potassium, dissolved	M200.7 ICP	1.6		mg/L	0.3	1	5/9/98	kr
Sodium, dissolved	M200.7 ICP	17.6		mg/L	0.3	1	5/9/98	kr

### Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010 ICP						5/13/98	laa

### Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M310.1							
Bicarbonate as CaCO3		290		mg/L	2	10	5/7/98	sts
Carbonate as CaCO3		4	B	mg/L	2	10	5/7/98	sts
Hydroxide as CaCO3			U	mg/L	2	10	5/7/98	sts
Total Alkalinity		294		mg/L	2	10	5/7/98	sts
Cation-Anion Balance	Calculation							
Cation-Anion Balance		1.4		%			5/20/98	calc
Sum of Anions		7.2		meq/L	0.1	0.5	5/20/98	calc
Sum of Cations		7.4		meq/L	0.1	0.5	5/20/98	calc
Chloride	M325.2 - Colorimetric (RFA)	4	B	mg/L	1	5	5/13/98	mh
Fluoride	M340.2 - ISE	0.2	B	mg/L	0.1	0.5	5/13/98	bk
Hardness as CaCO3	Calculation based on dissolved Ca & Mg	333		mg/L	1	7	5/20/98	calc
Oil & Grease, Total Recoverable	M413.1 - Gravimetric		U	mg/L	2	10	5/11/98	cj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	360		mg/L	10	20	5/4/98	cj/bk
Residue, Non-Filterable (TSS) @103-5C	M160.2 - Gravimetric	182		mg/L	5	20	5/4/98	cj
Sodium Absorption Ratio in Water	USGS - 11738-78	0.42			0.03	0.15	5/20/98	calc
Sulfate	M375.3 - Gravimetric	60		mg/L	10	20	5/9/98	sts
TDS (calculated)	Calculation	367		mg/L	10	50	5/20/98	calc
TDS (ratio - measured/calculated)	Calculation	0.98					5/20/98	calc

### Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL  
 B = Analyte concentration detected at a value between MDL and PQL  
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
30400 Downhill Drive  
Steamboat Springs, CO 80487  
(800) 334-5493

MAY 26 1998

Lab Sample ID: L18307-02  
Client Sample ID: DC-2  
Client Project ID:  
ACZ Report ID: RG67342

Soldier Creek Coal Company  
P.O. Box 1029  
Wellington, UT 84542  
Dave Spillman

Date Sampled: 4/27/98 11:05  
Date Received: 4/30/98  
Date Reported: 5/20/98

Sample Matrix: Surface Water

### Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	62.9		mg/L	0.2	1	5/9/98	kr
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	5/9/98	kr
Iron, total	M200.7 ICP	1.94		mg/L	0.01	0.05	5/13/98	gg
Magnesium, dissolved	M200.7 ICP	47.2		mg/L	0.2	1	5/9/98	kr
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	5/9/98	kr
Manganese, total	M200.7 ICP	0.078		mg/L	0.005	0.03	5/13/98	gg
Potassium, dissolved	M200.7 ICP	2.9		mg/L	0.3	1	5/11/98	kr
Sodium, dissolved	M200.7 ICP	32.2		mg/L	0.3	1	5/9/98	kr

### Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010 ICP						5/13/98	laa

### Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M310.1							
Bicarbonate as CaCO3		263		mg/L	2	10	5/7/98	sts
Carbonate as CaCO3			U	mg/L	2	10	5/7/98	sts
Hydroxide as CaCO3			U	mg/L	2	10	5/7/98	sts
Total Alkalinity		263		mg/L	2	10	5/7/98	sts
Cation-Anion Balance	Calculation							
Cation-Anion Balance		10.4		%			5/20/98	calc
Sum of Anions		6.9		meq/L	0.1	0.5	5/20/98	calc
Sum of Cations		8.5		meq/L	0.1	0.5	5/20/98	calc
Chloride	M325.2 - Colorimetric (RFA)	8		mg/L	1	5	5/13/98	mh
Fluoride	M340.2 - ISE	0.3	B	mg/L	0.1	0.5	5/13/98	bk
Hardness as CaCO3	Calculation based on dissolved Ca & Mg	351		mg/L	1	7	5/20/98	calc
Oil & Grease, Total Recoverable	M413.1 - Gravimetric		U	mg/L	2	10	5/11/98	cj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	400		mg/L	10	20	5/4/98	cj/bk
Residue, Non-Filterable (TSS) @103-5C	M160.2 - Gravimetric	126		mg/L	5	20	5/4/98	cj
Sodium Absorption Ratio in Water	USGS - 11738-78	0.75			0.03	0.15	5/20/98	calc
Sulfate	M375.3 - Gravimetric	70		mg/L	10	20	5/9/98	sts
TDS (calculated)	Calculation	381		mg/L	10	50	5/20/98	calc
TDS (ratio - measured/calculated)	Calculation	1.05					5/20/98	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

#### Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL  
B = Analyte concentration detected at a value between MDL and PQL  
PQL = Practical Quantitation Limit

*R. Poulsen*

Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
30400 Downhill Drive  
Steamboat Springs, CO 80487  
(800) 334-5493

MAY 26 1998

Lab Sample ID: L18307-03  
Client Sample ID: DC-3  
Client Project ID:  
ACZ Report ID: RG67343

Soldier Creek Coal Company  
P.O. Box 1029  
Wellington, UT 84542  
Dave Spillman

Date Sampled: 4/27/98 11:25  
Date Received: 4/30/98  
Date Reported: 5/20/98

Sample Matrix: Surface Water

### Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	61.6		mg/L	0.2	1	5/9/98	kr
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	5/9/98	kr
Iron, total	M200.7 ICP	1.15		mg/L	0.01	0.05	5/13/98	gg
Magnesium, dissolved	M200.7 ICP	38.0		mg/L	0.2	1	5/9/98	kr
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	5/9/98	kr
Manganese, total	M200.7 ICP	0.049		mg/L	0.005	0.03	5/13/98	gg
Potassium, dissolved	M200.7 ICP	1.7		mg/L	0.3	1	5/11/98	kr
Sodium, dissolved	M200.7 ICP	12.7		mg/L	0.3	1	5/9/98	kr

### Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010 ICP						5/13/98	laa

### Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M310.1							
Bicarbonate as CaCO3		269		mg/L	2	10	5/7/98	sts
Carbonate as CaCO3			U	mg/L	2	10	5/7/98	sts
Hydroxide as CaCO3			U	mg/L	2	10	5/7/98	sts
Total Alkalinity		271		mg/L	2	10	5/7/98	sts
Cation-Anion Balance	Calculation							
Cation-Anion Balance		3.0		%			5/20/98	calc
Sum of Anions		6.4		meq/L	0.1	0.5	5/20/98	calc
Sum of Cations		6.8		meq/L	0.1	0.5	5/20/98	calc
Chloride	M325.2 - Colorimetric (RFA)		U	mg/L	1	5	5/13/98	mh
Fluoride	M340.2 - ISE	0.2	B	mg/L	0.1	0.5	5/13/98	bk
Hardness as CaCO3	Calculation based on dissolved Ca & Mg	310		mg/L	1	7	5/20/98	calc
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	320		mg/L	10	20	5/4/98	cj/bk
Residue, Non-Filterable (TSS) @103-5C	M160.2 - Gravimetric	92		mg/L	5	20	5/4/98	cj
Sodium Absorption Ratio in Water	USGS - 11738-78	0.31			0.03	0.15	5/20/98	calc
Sulfate	M375.3 - Gravimetric	50		mg/L	10	20	5/9/98	sts
TDS (calculated)	Calculation	326		mg/L	10	50	5/20/98	calc
TDS (ratio - measured/calculated)	Calculation	0.98					5/20/98	calc

### Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL  
B = Analyte concentration detected at a value between MDL and PQL  
PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
 30400 Downhill Drive  
 Steamboat Springs, CO 80487  
 (800) 334-5493

Lab Sample ID: *L18424-02*  
 Client Sample ID: *DC-3*  
 Client Project ID:  
 ACZ Report ID: *RG68068*

Soldier Creek Coal Company  
 P.O. Box 1029  
 Wellington, UT 84542  
 Dave Spillman

Date Sampled: *5/6/98 13:35*  
 Date Received: *5/7/98*  
 Date Reported: *5/26/98*

Sample Matrix: *Surface Water*

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Oil & Grease, Total Recoverable	M9070 - Gravimetric		U	mg/L	2	10	5/20/98	cj

**Inorganic Qualifiers (based on EPA CLP 3/90)**

U = Analyte was analyzed for but not detected at the indicated MDL  
 B = Analyte concentration detected at a value between MDL and PQL  
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
 30400 Downhill Drive  
 Steamboat Springs, CO 80487  
 (800) 334-5493

Lab Sample ID: **L17938-02**  
 Client Sample ID: **DC-4**  
 Client Project ID:  
 ACZ Report ID: **RG65704**

Soldier Creek Coal Company  
 P.O. Box 1029  
 Wellington, UT 84542  
 Dave Spillman

Date Sampled: **3/30/98 11:50**  
 Date Received: **4/1/98**  
 Date Reported: **4/16/98**

Sample Matrix: *Surface Water*

**Metals Analysis**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	58.9		mg/L	0.2	1	4/6/98	jaw
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	4/6/98	jaw
Iron, total	M200.7 ICP	0.72		mg/L	0.01	0.05	4/16/98	ss
Magnesium, dissolved	M200.7 ICP	38.5		mg/L	0.2	1	4/4/98	kr
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	4/4/98	kr
Manganese, total	M200.7 ICP	0.030		mg/L	0.005	0.03	4/14/98	kr
Potassium, dissolved	M200.7 ICP	1.7		mg/L	0.3	1	4/4/98	kr
Sodium, dissolved	M200.7 ICP	15.7		mg/L	0.3	1	4/4/98	kr

**Metals Prep**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010 ICP						4/13/98	laa

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M310.1							
Bicarbonate as CaCO3		260		mg/L	2	10	4/8/98	bk
Carbonate as CaCO3			U	mg/L	2	10	4/8/98	bk
Hydroxide as CaCO3			U	mg/L	2	10	4/8/98	bk
Total Alkalinity		260		mg/L	2	10	4/8/98	bk
Cation-Anion Balance	Calculation							
Cation-Anion Balance		-1.4		%			4/16/98	calc
Sum of Anions		7.0		meq/L	0.1	0.5	4/16/98	calc
Sum of Cations		6.8		meq/L	0.1	0.5	4/16/98	calc
Chloride	M325.2 - Colorimetric (RFA)	4	B	mg/L	1	5	4/9/98	mh
Fluoride	M340.2 - ISE	0.3	B	mg/L	0.1	0.5	4/6/98	bk
Hardness as CaCO3	Calculation based on dissolved Ca & Mg	305		mg/L	1	7	4/16/98	calc
Nitrate as N, dissolved	M353.2 - Automated Cadmium Reduction	0.05	B	mg/L	0.02	0.1	4/1/98	ss
Nitrate/Nitrite as N, dissolved	M353.2 - Automated Cadmium Reduction	0.05	B	mg/L	0.02	0.1	4/1/98	ss
Nitrite as N, dissolved	M353.2 - Automated Cadmium Reduction		U	mg/L	0.01	0.05	4/1/98	ss
Oil & Grease, Total Recoverable	M413.1 - Gravimetric		U	mg/L	2	10	4/10/98	cj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	350		mg/L	10	20	4/3/98	bk
Residue, Non-Filterable (TSS) @103-5C	M160.2 - Gravimetric	58		mg/L	5	20	4/7/98	cj
Sodium Absorption Ratio in Water	USGS - 11738-78	0.39			0.03	0.15	4/16/98	calc
Sulfate	M375.3 - Gravimetric	80		mg/L	10	20	4/3/98	sts
TDS (calculated)	Calculation	355		mg/L	10	50	4/16/98	calc
TDS (ratio - measured/calculated)	Calculation	0.99					4/16/98	calc

**Inorganic Qualifiers (based on EPA CLP 3/90)**

U = Analyte was analyzed for but not detected at the indicated MDL  
 B = Analyte concentration detected at a value between MDL and PQL  
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
30400 Downhill Drive  
Steamboat Springs, CO 80487  
(800) 334-5493

Soldier Creek Coal Company  
P.O. Box 1029  
Wellington, UT 84542  
Dave Spillman

Lab Sample ID: *L17938-02*  
Client Sample ID: *DC-4*  
Client Project ID:  
ACZ Report ID: *RG65704*

Date Sampled: *3/30/98 11:50*  
Date Received: *4/1/98*  
Date Reported: *4/16/98*

Sample Matrix: *Surface Water*

---

**Note:** Sample required re-analysis for TSS after the applicable holdtime had expired.

**Inorganic Qualifiers (based on EPA CLP 3/90)**

U = Analyte was analyzed for but not detected at the indicated MDL  
B = Analyte concentration detected at a value between MDL and PQL  
PQL = Practical Quantitation Limit

ACZ Laboratories, Inc.  
 30400 Downhill Drive  
 Steamboat Springs, CO 80487  
 (800) 334-5493

Lab Sample ID: **L17938-03**  
 Client Sample ID: **DC-5**  
 Client Project ID:  
 ACZ Report ID: **RG65705**

Soldier Creek Coal Company  
 P.O. Box 1029  
 Wellington, UT 84542  
 Dave Spillman

Date Sampled: **3/30/98 12:06**  
 Date Received: **4/1/98**  
 Date Reported: **4/16/98**

Sample Matrix: *Surface Water*

### Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	63.5		mg/L	0.2	1	4/6/98	jaw
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	4/6/98	jaw
Iron, total	M200.7 ICP	1.26		mg/L	0.01	0.05	4/16/98	ss
Magnesium, dissolved	M200.7 ICP	48.2		mg/L	0.2	1	4/6/98	jaw
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	4/6/98	jaw
Manganese, total	M200.7 ICP	0.036		mg/L	0.005	0.03	4/14/98	kr
Potassium, dissolved	M200.7 ICP	1.7		mg/L	0.3	1	4/6/98	jaw
Sodium, dissolved	M200.7 ICP	27.2		mg/L	0.3	1	4/6/98	jaw

### Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M3010 ICP						4/13/98	laa

### Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M310.1							
Bicarbonate as CaCO3		322		mg/L	2	10	4/8/98	bk
Carbonate as CaCO3			U	mg/L	2	10	4/8/98	bk
Hydroxide as CaCO3			U	mg/L	2	10	4/8/98	bk
Total Alkalinity		322		mg/L	2	10	4/8/98	bk
Cation-Anion Balance	Calculation							
Cation-Anion Balance		1.2		%			4/16/98	calc
Sum of Anions		8.1		meq/L	0.1	0.5	4/16/98	calc
Sum of Cations		8.3		meq/L	0.1	0.5	4/16/98	calc
Chloride	M325.2 - Colorimetric (RFA)	6		mg/L	1	5	4/9/98	mh
Fluoride	M340.2 - ISE	0.3	B	mg/L	0.1	0.5	4/6/98	bk
Hardness as CaCO3	Calculation based on dissolved Ca & Mg	357		mg/L	1	7	4/16/98	calc
Nitrate as N, dissolved	M353.2 - Automated Cadmium Reduction	0.10		mg/L	0.02	0.1	4/1/98	ss
Nitrate/Nitrite as N, dissolved	M353.2 - Automated Cadmium Reduction	0.10		mg/L	0.02	0.1	4/1/98	ss
Nitrite as N, dissolved	M353.2 - Automated Cadmium Reduction		U	mg/L	0.01	0.05	4/1/98	ss
Oil & Grease, Total Recoverable	M413.1 - Gravimetric		U	mg/L	2	10	4/10/98	cj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	290		mg/L	10	20	4/3/98	bk
Residue, Non-Filterable (TSS) @103-5C	M160.2 - Gravimetric	120		mg/L	5	20	4/7/98	cj
Sodium Absorption Ratio in Water	USGS - 11738-78	0.63			0.03	0.15	4/16/98	calc
Sulfate	M375.3 - Gravimetric	70		mg/L	10	20	4/3/98	sts
TDS (calculated)	Calculation	411		mg/L	10	50	4/16/98	calc
TDS (ratio - measured/calculated)	Calculation	0.71					4/16/98	calc

### Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL  
 B = Analyte concentration detected at a value between MDL and PQL  
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.  
30400 Downhill Drive  
Steamboat Springs, CO 80487  
(800) 334-5493

Soldier Creek Coal Company  
P.O. Box 1029  
Wellington, UT 84542  
Dave Spillman

Lab Sample ID: *L17938-03*  
Client Sample ID: *DC-5*  
Client Project ID:  
ACZ Report ID: *RG65705*

Date Sampled: *3/30/98 12:06*  
Date Received: *4/1/98*  
Date Reported: *4/16/98*

Sample Matrix: *Surface Water*

---

**Note: Sample required re-analysis for TSS after the applicable holdtime had expired.**

**Inorganic Qualifiers (based on EPA CLP 3/90)**

U = Analyte was analyzed for but not detected at the indicated MDL  
B = Analyte concentration detected at a value between MDL and PQL  
PQL = Practical Quantitation Limit