

**2002 ANNUAL REPORT
TO THE
UTAH DIVISION OF OIL, GAS AND MINING**

**SOLDIER CANYON MINE
C/007/018**

Canyon Fuel Company, LLC
P.O. Box 1029
Wellington, UT 84542

File in:

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- Expandable

Refer to Record No. 0002 Date 03272003
In C 0070018, 2003 Utah Mining
For additional information



Canyon Fuel Company, LLC
 Soldier Canyon Mine
 P.O. Box 1029
 Wellington, Utah 84542
 (435) 637-6360 Fax: (435) 637-0108

COPY

0002

March 27, 2003

Ms. Pamela Grubaugh-Littig
 Utah Coal Regulatory Program
 Utah Division of Oil, Gas and Mining
 1594 West North Temple, Suite 1210
 Salt Lake City, UT 84114-5801

*Orig. C/007/018 ✓
 Copy C/007/034
 Copy C/007/039*

RE: 2002 Annual Reports for Dugout Canyon Mine, C/007/039; Soldier Canyon Mine, C/007/018; and Banning Loadout, C/007/034

Dear Ms. Pamela Grubaugh-Littig,

Enclosed please find two copies of the Annual Reports for 2002 for the Dugout Canyon Mine, Soldier Canyon Mine, and Banning Loadout.

Should you have any questions concerning this submittal, either contact myself at (435) 636-2869 or Chris Hansen at (435) 448-2669.

Sincerely yours,

Vicky S. Miller

Vicky S. Miller

enclosures

cc: Chris Hansen (letter only)
 Dave Spillman (enclosures)
 Central Files (enclosures)

RECEIVED

MAR 27 2003

DIV. OF OIL, GAS & MINING

File in: *C00700182003 Incoming*

Refer to:

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Date *3/27/03* for additional information

To enter text, click in the box and type your response. If a box already contains an entry select the entry and type the replacement. You can use the **tab** key to move from one field to the next. To select a check box, click in the box or type an x.

GENERAL INFORMATION

| | |
|--|--|
| Permitte Name | Canyon Fuel Company, LLC |
| Mine Name | Soldier Canyon Mine |
| Operator Name (If other then permittee) | |
| Permit Expiration Date | February 3, 2007 |
| Permit Number | C/007/018 |
| Authorized Representative Title | Rick Olsen, General Manager |
| Phone Number | (435) 637-6360 |
| Fax Number | (435) 636-2897 |
| E-mail Address | |
| Mailing Address | P.O. Box 1029, Wellington, Utah 84542 |
| Resident Agent | C.T. Corporate Systems |
| Resident Agent Mailing Address | 50 West Broadway, Salt Lake City, Utah 84104 |
| Number of Binders Submitted | (1) Binder, Two Copies |

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

| Permit Type | ID Number | Description | Expiration Date |
|-----------------------|-------------|------------------------------|------------------|
| MSHA Mine ID(s) | 42-00077 | | N/A |
| MSHA Impoundment(s) | N/A | | |
| NPDES/UPDES Permit(s) | UTG 0023680 | UPDES Discharge Permit | March 31, 2006 |
| PSD Permit(s) (Air) | DAQE-334-94 | Air Quality Permit | N/A |
| Other | | | |
| Storm Water Permit | UTR000574 | Storm Water Discharge Permit | December 1, 2006 |
| | | | |
| | | | |

CERTIFIED REPORTS

List the certified inspection reports as required by the rules and under the approved plan that must be periodically submitted to the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

| Certified Reports: | Required | | Included or on file with DOGM | | Comments |
|--------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|----------|
| | Yes | No | Included | On File | |
| Excess Spoil Piles | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | N/A |
| Refuse Piles | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | N/A |
| Impoundments | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

REPORTING OF OTHER TECHNICAL DATA

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

| Technical Data: | Required | | Included or on file with DOGM | | Comments |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|
| | Yes | No | Included | On file | |
| Climatological | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Subsidence Monitoring | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Vegetation Monitoring | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Raptor Survey | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Soils Monitoring | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Water Monitoring | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| First quarter | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Second quarter | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Third quarter | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Fourth quarter | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Geological / Geophysical | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Engineering | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Non Coal Waste / Abandoned Underground Equipment* | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Not Required |
| Other Data | | | | | |
| Drought Study | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| SNOTEL Report | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | See Appendix B of Dugout Canyon Mine 2002 Annual Report |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

*Reminder: If equipment has been abandoned during 2002, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there was any hazardous or toxic materials and any revision to the PHC as necessary.

APPENDIX A

Certified Reports

Excess Spoil Piles
Refuse Piles
Impoundments

As required under R645-301-514

CONTENTS

CERTIFIED IMPOUNDMENT REPORT

| IMPOUNDMENT INSPECTION AND CERTIFIED REPORT | | Page 1 of 2 | |
|--|---|-------------------------------------|----------|
| Permit Number | ACT/007/018 | Report Date | 12/31/02 |
| Mine Name | Soldier Canyon Mine | | |
| Company Name | Canyon Fuel Company, LLC | | |
| Impoundment Identification | Impoundment Name | Surface Facility Sedimentation Pond | |
| | Impoundment Number | None | |
| | UPDES Permit Number | UT0023680 | |
| | MSHA ID Number | Impoundment -None (Mine - 42-00077) | |
| IMPOUNDMENT INSPECTION | | | |
| Inspection Date | 10/23/02 | | |
| Inspected By | David G. Spillman | | |
| Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction) | Routine Quarterly Inspection & Annual Certification | | |
| <p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p><i>There were no signs of instability, structural weakness or other hazardous conditions observed at the sedimentation pond.</i></p> | | | |
| Required for an impoundment which functions as a SEDIMENTATION POND. | <p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p><i>Sediment Storage Capacity (as designed) - 100% = 1.47 acre-feet @ an elevation of 6,649.5 feet</i> <i>- 60% = 0.88 acre-feet @ an elevation of 6,647.5 feet</i></p> <p><i>The existing sediment level was obscured by impounded water and could not be estimated at the time of the inspection. It is, however, believed to be well below the established clean-out elevation.</i></p> | | |
| | <p>3. Principle and emergency spillway elevations.</p> <p><i>Principal Spillway Elevation - 6,654.5 feet</i> <i>Emergency Spillway Elevation - 6,654.5 feet</i></p> | | |
| <p>4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.</p> <p><i>At the time of the inspection, the pond water level was observed to be approximately three feet below the bottom of the decant valve (installed at the principal spillway).</i></p> <p><i>There has been no discharge from the pond during 2002.</i></p> | | | |

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

At the time of inspection, the water elevation was approximately 7 feet below the top of the primary spillway. The impounded water was partially frozen over and sediment levels were difficult to observe. Observations made earlier in the month indicate that the sediment level in the pond is nearing cleanout elevation. It is, therefore, recommended that plans be made to remove the sediment accumulations during the spring of 2003.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: _____ Date: _____

CERTIFIED REPORT

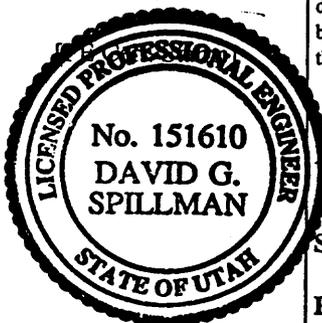
IMPOUNDMENT EVALUATION (If NO, explain under Comments)

| | YES | NO |
|--|-----|----|
| 1. Is impoundment designed and constructed in accordance with the approved plan? | X | |
| 2. Is impoundment free of instability, structural weakness, or any other hazardous condition? | X | |
| 3. Has the impoundment met all applicable performance standards and effluent limitations from the previous date of inspection? | X | |

COMMENTS AND OTHER INFORMATION

Certification Statement:

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability in accordance with the Utah R645 Coal Mining Rules.



by: David G. Spillman, Technical Services Manager
(Full Name and Title)

Signature: David G. Spillman Date: 12-31-02

P.E. Number & State: No. 151610, State of Utah

| | | |
|--|--|--------------------|
| IMPOUNDMENT INSPECTION AND CERTIFIED REPORT | | Page 1 of 2 |
|--|--|--------------------|

| | | | |
|----------------------------|--------------------------|-------------------------------------|----------|
| Permit Number | ACT/007/018 | Report Date | 12/31/02 |
| Mine Name | Soldier Canyon Mine | | |
| Company Name | Canyon Fuel Company, LLC | | |
| Impoundment Identification | Impoundment Name | Sewage Lagoon | |
| | Impoundment Number | None | |
| | UPDES Permit Number | None | |
| | MSHA ID Number | Impoundment -None (Mine - 42-00077) | |

IMPOUNDMENT INSPECTION

| | | | |
|---|---|--|--|
| Inspection Date | 12/02/02 | | |
| Inspected By | Dave Spillman | | |
| Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction) | Routine Quarterly Inspection & Annual Certification | | |

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There were no signs of instability, structural weakness or other hazardous conditions observed during this inspection.

| | |
|--|---|
| <p>Required for an impoundment which functions as a SEDIMENTATION POND.</p> | <p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p style="text-align: center;">N/A</p> |
| | <p>3. Principle and emergency spillway elevations.</p> <p style="text-align: center;">N/A</p> |

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

The sewage lagoon is designed for total containment and has never discharged.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

At the time of the inspection, the south cell was dry and the north cell contained a very small quantity of water.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: _____ Date: _____

CERTIFIED REPORT

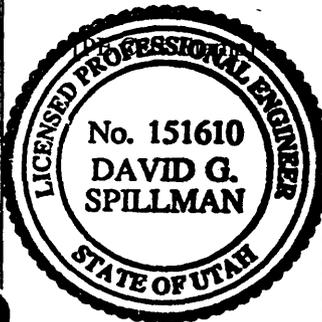
IMPOUNDMENT EVALUATION (If NO, explain under Comments)

| | YES | NO |
|--|-----|----|
| 1. Is impoundment designed and constructed in accordance with the approved plan? | X | |
| 2. Is impoundment free of instability, structural weakness, or any other hazardous condition? | X | |
| 3. Has the impoundment met all applicable performance standards and effluent limitations from the previous date of inspection? | X | |

COMMENTS AND OTHER INFORMATION

Certification Statement:

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability in accordance with the Utah R645 Coal Mining Rules.



By: David G. Spillman, Technical Services Manager

(Full Name and Title)

Signature: David G. Spillman Date: 12/31/02

P.E. Number & State: No. 151610, State of Utah

APPENDIX B

Reporting of Technical Data

Including monitoring data, reports, maps, and other information
As required under the approved plan or as required by the Division

In accordance with the requirement of R645-310-130 and R645-301-140

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DROUGHT STUDY

**Report of 2002 Hydrologic
Monitoring at the Soldier
Canyon and Dugout Canyon
Mines**

Canyon Fuel Company, LLC
Soldier Canyon and Dugout Mines
Wellington, Utah



PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

**Report of 2002 Hydrologic
Monitoring at the Soldier
Canyon and Dugout Canyon
Mines**

25 March 2003

Canyon Fuel Company, LLC
Soldier Canyon and Dugout Mines
Wellington, Utah



PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

**Report of 2002 Hydrologic
Monitoring at the Soldier
Canyon and Dugout Canyon
Mines**

25 March 2003

Canyon Fuel Company, LLC
Soldier Canyon and Dugout Mines
Wellington, Utah

Prepared by:



Erik C. Petersen, P.G.



PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

2695 N. 600 E.
LEHI, UTAH 84043
(801) 766-4006

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 Figure 3 Stiff diagrams for 2002 hydrologic monitoring sites
 Figure 4 Stiff diagrams for historic in-mine monitoring at the Soldier Canyon Mine
 Figure 5 Discharge hydrographs with tritium contents for 2002 monitoring sites
 Figure 6 Composite discharge hydrographs for streams in the permit area

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 Table 2 Precipitation data from the Dugout Canyon Mine for 2002
 Table 3 Discharge, solute, and tritium data from the 2002 hydrologic monitoring
 Table 4 Tritium and solute compositions from historic monitoring at the Soldier Canyon Mine

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Appendix 1 Tritium Laboratory reporting sheets
 Appendix 2 Solute Laboratory reporting sheets

**Report of 2002 Hydrologic Monitoring at the
Soldier Canyon and Dugout Canyon Mines**

1.0 Introduction

Canyon Fuel Company's Soldier Canyon and Dugout Canyon Mines are located in the Book Cliffs coal field, approximately 10 miles northeast of the town of Wellington, Utah (Figure 1). As part of a comprehensive groundwater and surface-water investigation performed by Mayo and Associates (1996) a rigorous hydrologic monitoring plan was recommended that would validate their findings that:

- 1) The Blackhawk Formation in which the mined coal seams exist does not contribute baseflow to streams in the permit area,
- 2) Groundwater systems in the Flagstaff Limestone and North Horn Formations operate independently of groundwater systems in the Blackhawk Formation
- 3) The temporal variability of spring discharge rates from the Flagstaff Limestone and North Horn Formations are due to climatic variability, and
- 4) Mining will not affect groundwater systems in the Flagstaff Limestone and North Horn Formation.

In order to validate these findings, the monitoring plan recommended by Mayo and Associates specifies that weekly monitoring of selected springs and streams and periodic sampling for tritium will occur between 1 April and 31 August during the first wet or dry year occurrence. Wet or dry years for the mine area are defined based on the Natural Resource Conservation Service snow pack measurements as of 1 March for the Price River-San Rafael River Basin. A wet year occurs when the snow pack water content is greater than 110% of normal. A dry year occurs when the snow pack water content is less than 70% of normal.

The recommended monitoring plan was approved by the Utah Division of Oil, Gas and Mining and implemented by Canyon Fuel Company. As of 1 March 2002, the snow pack for the Price-San Rafael Basin was less than 70% of normal, and the rigorous dry-year monitoring protocol was implemented. The purpose of this report is to:

- 1) Present the 2002 hydrologic monitoring data in tabular and graphical form, and
- 2) Analyze the monitoring data to provide verification that the findings of Mayo and Associates, listed above, are correct.

Including this introduction, this report contains the following sections:

1. Introduction
2. Methods of study
3. Climate
4. Presentation of data

5. Blackhawk Formation contributions to streams
6. Discharge characteristics and temporal variability of Flagstaff Limestone and North Horn Formation springs
7. Potential for mining-related impacts to Flagstaff Limestone and North Horn Formation springs
8. References cited

2.0 Methods of Study

Stream discharge measurements were performed by Canyon Fuel personnel using area-velocity techniques during high-flow periods and using a calibrated container and a stopwatch during low-flow periods. Spring discharge measurements were performed by Canyon Fuel personnel using a calibrated container and a stopwatch.

Samples for tritium analysis were collected in tightly sealed amber glass bottles by Canyon Fuel personnel. Tritium analyses were performed using direct counting techniques by the Tritium Laboratory, University of Miami, Florida. Tritium laboratory reporting sheets are included in Appendix A.

Samples of groundwater and surface water for solute analysis were collected in laboratory provided containers. Most solute analyses were performed by ACZ Laboratories, Inc. of

Steamboat Springs, Colorado. Other solute analyses were performed by Commercial Testing

and Engineering Co. of Huntington, Utah. Solute laboratory reporting sheets are included in Appendix B.

Field water quality measurements including discharge temperature, pH, specific conductivity, and dissolved oxygen were measured in the field by Canyon Fuel personnel.

Solute data were analyzed using Stiff (1951) diagrams. Discharge and tritium data were plotted on X-Y graphs for analysis.

Climatic conditions in the region were evaluated using the Palmer Hydrologic Drought Index and precipitation data collected at the Dugout Canyon Mine.

3.0 Climate

Daily precipitation data are collected at the Dugout Canyon Mine weather station.

Precipitation data for the period 1 April to 31 August 2002 (the period of hydrologic monitoring) are listed on Table 2. The total precipitation for this five-month period was 2.32 inches, which is reflective of the drought conditions that prevailed during the period of monitoring.

Plots of the Palmer Hydrologic Drought Index (PHDI; NCDC, 1997; Karl, 1986; Guttman, 1991) for Utah Divisions 6 and 7 are shown in Figure 2. The Soldier Canyon and Dugout

Canyon Mines lie near the intersection of these two regions and the PHDI for both regions has been utilized in this analysis. The PHDI indicates the long-term climatic trends for the region. It is a monthly value generated by the National Climatic Data Center that indicates the severity of a wet or dry spell. The PHDI is computed from climatic and hydrologic parameters such as temperature, precipitation, evapotranspiration, soil water recharge, soil water loss, and runoff. Because the PHDI takes into account parameters that affect the balance between moisture supply and moisture demand, the index is a useful tool for evaluating the long-term relationship between climate and groundwater recharge and discharge. The PHDI is useful for determining whether variations in spring or stream discharges are the result of climatic variability or whether they are the result of other factors.

The plots of the PHDI for Utah Regions 6 and 7 indicate that the period of hydrologic monitoring (1 April to 31 August 2002) was one of extreme drought.

4.0 Presentation of Data

Discharge, solute compositions, and tritium contents of groundwaters and surface waters monitored in 2002 are presented in Table 3. Solute compositions are plotted graphically as Stiff (1951) diagrams on Figure 3. The solute composition of groundwaters monitored historically in the Soldier Canyon Mine are listed in Table 4 and shown graphically as Stiff diagrams in Figure 4. Stiff diagrams are a useful tool to analyze and compare the major ion chemistry of groundwater and surface water. The shape of a stiff diagram is a function of the

chemical type of the water, while the size of the Stiff diagram is a function of the total dissolved solids concentration of the water.

Discharge hydrographs for each of the hydrologic monitoring sites for 2002 are presented in Figure 5. The daily precipitation data from the Dugout Canyon Mine are also plotted on bar graphs in Figure 5. Stream discharge hydrographs allowing comparison of discharge at different locations for each of the major stream drainages in the permit area are presented in Figure 6. Also included on Figures 5 and 6 are time series plots of tritium contents for each monitoring site. A brief overview of the practical application of tritium in hydrogeologic applications is given below.

Tritium (^3H) is the radioactive isotope of hydrogen. Tritium has been used in groundwater investigations to differentiate between groundwaters that recharged prior to or after the advent of atmospheric thermonuclear weapons testing. Tritium, with a half-life of 12.43 years, forms naturally in the upper stratosphere by the interaction of ^{14}N with cosmic ray neutrons. Tritium is rapidly incorporated into water molecules and is removed from the atmosphere by precipitation.

Prior to the advent of atmospheric thermonuclear weapons testing in 1952, tritium activity in precipitation ranged from about 4 to 25 tritium units (TU; Mayo and Associates, 1996). One TU equals one ^3H atom per 10^8 hydrogen atoms. In mountainous areas, larger natural concentrations have been observed (Fontes, 1983). During the peak of atmospheric weapons testing, tritium levels in precipitation rose to more than 2,200 TU in some northern

hemisphere locations (Fontes, 1983). As of 1987, the ^3H concentrations in rain water varied from 25 to 50 TU. Unpublished data of 1991, 1992, and 1997 snow and rain samples collected in the central Wasatch Range, Utah have tritium concentrations ranging from about 5 to 20 TU or more (Mayo and Associates, 1996). Thus, at present, the tritium concentration of precipitation waters in the Wasatch Plateau and Book Cliffs area are similar to pre-bomb levels. Generally, groundwater that has a component of recharge older than about 50 years will contain some tritium (generally greater than about 1 TU), while groundwater older than about 50 years will contain little or no tritium (Clark and Fritz, 1997).

The analytical errors associated with the tritium analyses used in this investigation are indicated on the tritium laboratory reporting sheets (Appendix A). Tritium analyses used in this investigation were performed using direct counting methods. Generally, the eTU (laboratory analytical error) for direct-count tritium analysis is on the order of 2.5 to 3 TU.

In evaluating the tritium contents of groundwaters and surface waters monitored in the permit area during 2002, it is important to consider that most springs and streams in the Book Cliffs and Wasatch Plateau that receive annual recharge have tritium contents ranging from about 5 to 25 TU, while deep, Blackhawk Formation groundwater encountered in underground mine workings in the permit area are generally many thousands of years old and contain no tritium (average tritium content = 0.09 TU; Table 4). Discharge from the deep groundwater systems intercepted by coal mine workings in the region are not influenced by climatic or seasonal variations (Mayo and Associates, 1996). Therefore, were deep Blackhawk Formation

groundwater systems contributing baseflow to streams, this contribution would be anticipated to be entirely independent of seasonal or climatic variability.

5.0 Blackhawk Formation Contributions to Streams

Discharge and tritium data were collected from the four principal surface-water drainages during 2002. These include the Soldier Creek drainage, Dugout Creek drainage, Pace Canyon Creek drainage, and the Rock Canyon Creek drainage. Discharge hydrographs and tritium contents for these streams are shown on Figures 6a-6d. These data were collected for the purpose of determining whether the Blackhawk Formation (or other geologic formations stratigraphically above the coal seams) contributes baseflow to these drainages.

Groundwater-surface-water interactions in each of the four principal drainages are discussed below.

Soldier Canyon Creek

Soldier Canyon Creek is monitored at site G-7, which is located in the North Horn Formation north of the permit area, and at G-6, which is located in the Blackhawk Formation above the mine discharge point. These sites are shown on Figure 1. It is apparent from the discharge hydrograph for Soldier Creek (Figure 6a) that, during the high-flow period, the discharge at the upper site is generally greater than at the lower site. During the low-flow period from early June to late August, the discharges at the upper and lower sites are essentially equal (within the error of the measurement technique). Thus, there is no significant contribution to

the discharge in Soldier Creek from bedrock lithologies in the monitored reach of the drainage. The fact that the discharge in Soldier Creek diminished to less than 1 gpm at the lower monitoring site (G-6) during August 2002 likewise indicates that there is not a significant contribution from deep, drought-resistant bedrock groundwater systems. It is likely that the stream losses observed between G-6 and G-7 are the result of evapotranspiration losses and possibly also as a result of the stream losing water to shallow groundwater systems in hydraulic communication with the creek.

The solute composition of surface water in Soldier Creek measured at G-6 and G-7 is somewhat distinct from the other stream systems in the permit and adjacent areas (Figure 3). Most notably, the sodium content of Soldier Creek water at both G-6 and G-7 is elevated relative to other streams in the permit area (Figure 3; Table 3). The solute composition of Soldier Creek is likely influenced by discharge from the North Horn Formation Spring 10 (Sulfur Spring) and diffuse seepage from similar groundwater systems in the nearby vicinity. Spring 10 discharges water that is elevated in sodium content (and other constituents) relative to most shallow groundwater in the region.

Based on the stream discharge data at G-6 and G-7 (consistently lower discharge downstream relative to the upstream monitoring location), it is evident that there is no appreciable groundwater contribution to Soldier Creek below G-7 during drought conditions. In this stream reach, Soldier Creek flows over portions of the Price River Formation, Castlegate Sandstone, and Blackhawk Formation.

Dugout Canyon Creek

Dugout Canyon Creek is monitored at sites DC-4 and DC-5 (upper left and upper right forks, respectively), at DC-2 (lower main fork), and at DC-3 (lower right fork tributary). These sites are shown on Figure 1. Sites DC-4 and DC-5 are located at the upper Blackhawk Formation contact with the overlying Castlegate Sandstone. Sites DC-2 and DC-3 are located in the Blackhawk Formation above the mined coal seams. Discharge hydrographs and tritium contents in Dugout Canyon Creek are shown in Figure 6b. The upstream discharge in Dugout Canyon Creek (above the Blackhawk Formation) is represented by the combined discharge in DC-4 and DC-5. The downstream discharge (lower Blackhawk Formation) is measured at DC-2. It is apparent from Figure 6b that during the 2002 high-flow season, the discharge in the upstream reach of Dugout Canyon Creek is similar to or greater than that measured at the lower reach. During the mid-season, discharge at the lower site was consistently lower than that above. During the 2002 low-flow season, all of the monitoring stations in Dugout Canyon Creek eventually became dry. Based on these observations, it is concluded that there is not a measurable contribution to the baseflow of Dugout Canyon Creek from the Blackhawk Formation during drought conditions. The lower right fork tributary to Dugout Canyon Creek (measured at DC-3) flows over the entire section of the Blackhawk Formation above the coal seams. The fact that DC-3 went dry in mid-May 2002 (Table 2) indicates that there is not a significant contribution to baseflow discharge in Dugout Canyon Creek from the Blackhawk Formation during drought conditions.

The tritium content measured at both upstream and downstream locations in Dugout Canyon Creek are similar, and the concentrations are consistent with modern recharge. There is no

decrease in the tritium content at downstream monitoring locations as would be anticipated were deep, tritium-free groundwater from the Blackhawk Formation entering the stream channel. Likewise, the solute compositions of stream water monitored at upstream and downstream locations are similar. The solute composition of deep Blackhawk Formation groundwater (as monitored in the Soldier Canyon Mine; Table 4; Figure 6) is fundamentally different from stream water in Dugout Canyon Creek.

Pace Canyon Creek

Pace Canyon Creek is monitored at PC-1A, which is situated on the North Horn Formation east of the permit area, and at PC-2, which is situated on the Blackhawk Formation (Figure 1). Discharge hydrographs and tritium plots for Pace Canyon Creek are shown on Figure 6c. During April and May, the discharge measured at PC-1A was greater than that measured at PC-2. During June, July, and August, the discharge at PC-1A stabilized at approximately 7 to 8 gpm, while the discharge at PC-2 ceased. This indicates that the Blackhawk Formation (which would be expected to be drought resistant) is not yielding water to the Pace Canyon Creek drainage. The 7 to 8 gpm loss between PC-1A and PC-2 is likely the result of evapotranspiration loss and possibly to recharge of shallow groundwater systems over this approximately 3.5 mile reach of the stream.

The increase in TDS and other chemical constituents in PC-2 relative to PC-1A is likely caused by dissolution of soluble minerals as the meager stream discharge flows over the 3.5 mile stream reach. The tritium content measured at both PC-1A and PC-2 are similar and are

consistent with modern recharge water. There is no indication of an influx of tritium-free Blackhawk Formation water into the stream.

Rock Canyon Creek

Rock Canyon Creek is monitored at RC-1, which is located on the Blackhawk Formation immediately above the mined coal seams (Figure 1). No discharge occurred at RC-1 during the 2002 hydrologic monitoring. This indicates that there is not any appreciable contribution to baseflow in Rock Canyon Creek derived from the Blackhawk Formation.

6.0 Discharge characteristics and Temporal Variability of Flagstaff Limestone and North Horn Formation Springs

Selected springs from the Flagstaff Limestone and North Horn Formation were monitored weekly for discharge and field parameters in 2002 to determine spring discharge characteristics in these geologic formations. Selected springs from the Colton Formation and Castlegate Sandstone were also monitored. The discharge characteristics of springs in each of these formations are described below.

Colton Formation

Two springs in the Colton Formation were monitored in 2002. These include SC-65 and spring 260. Discharge hydrographs and tritium contents for these springs are shown on Figures 5a and 5b. Discharge from SC-65 during 2002 was meager, ranging from 0.12 to 0.76 gpm. From mid-May through the end of August, 2002, discharge at SC-65 declined

continuously. Discharge at spring 260 showed a sporadic, gradual decline during the 2002 monitoring, with a discharge ranging from 6.4 to 19 gpm. Rather than a gradual, predictable discharge recession as would be anticipated were a large, buffered groundwater system being drained, discharge from spring 260 was sporadic. The sporadic discharge from spring 260 suggests local recharge influences to the spring.

The fact that both of the Colton Formation springs show marked seasonal variability in discharge rate and rapid responses to local recharge and/or climatic events (as evidenced by the sporadic nature of the hydrograph recessions) suggests that the groundwater systems from which these springs discharge are local in nature. The solute compositions of these springs are consistent with shallow groundwaters encountered elsewhere in the region and are dissimilar to deep groundwaters encountered in the Blackhawk Formation. The low-flow and high-flow tritium samples from both Colton Formation springs are consistent with modern recharge. There is no late-season decline in the tritium concentrations relative to the high-flow concentrations at the Colton Formation springs that could be indicative of a deeper, drought-resistant component of recharge to the springs. There is no indication that these springs are sustained from a deep, regional aquifer such as the deep Blackhawk Formation groundwater systems encountered in the mine.

Flagstaff Limestone

Two springs from the Flagstaff Limestone were monitored during 2002. These include SP-20 and SC-100. Discharge hydrographs and tritium plots for these springs are shown in

Figures 5c and 5d, respectively. Discharge from both Flagstaff springs is meager. Discharge

from SP-20 during 2002 ranged from 2.26 to 0.16 gpm. The recession characteristics of SP-20 are consistent with that of the fractured limestone groundwater system that supports the spring. Because the groundwater storage capacity of the fractured limestone is low, the discharge declines rapidly after the annual snowmelt event. The discharge from SC-100 shows a meager discharge and a rapid discharge recession. The initial discharge from SC-100 during 2002 was only 0.13 gpm and within two weeks the spring was dry.

The discharge characteristics of the Flagstaff Limestone springs monitored in 2002 clearly demonstrate that there is no contribution from deep aquifers to the Flagstaff Limestone. The tritium contents of both springs are consistent with modern recharge water. The low-flow tritium sample from SP-20 is similar to that of the high-flow sample. The solute compositions of the Flagstaff Limestone springs in the permit area are consistent with shallow groundwaters encountered elsewhere in the region and are dissimilar to deep groundwaters encountered in the Blackhawk Formation in the permit area. These factors indicate that there is not a component of deep groundwater sustaining the Flagstaff Limestone springs.

North Horn Formation

Most springs in the Soldier Canyon and Dugout Canyon Mine area discharge from the North Horn Formation. The North Horn springs monitored during 2002 include SC-116, SC-14, and springs 5, 10, 23, 24, 200, 203, and 259. Discharge hydrographs and tritium plots for these springs are shown on Figures 5e-5m. Four of these springs, springs 23, 24, 227, and 259 were dry throughout the 2002 monitoring, and spring 200 discharged only for a few days

at a meager 0.0013 gpm (Table 3). With the exception of spring 203, where discharge ranged from 2.5 to 6.7 gpm, all North Horn Formation springs had peak discharges less than 2 gpm. All of the North Horn Formation springs showed marked discharge declines as the year progressed in 2002. With the exception of Spring 10 (discussed below), there is no evidence of any significant baseflow component that could be derived from discharge from a deep aquifer system. Likewise, the chemical compositions of these springs are generally similar to other springs discharging from shallow groundwater systems in the region. Significant seasonable variability in solute composition at individual springs is also not apparent (Figure 3). This is significant because, were deep Blackhawk Formation groundwaters contributing to the discharge of North Horn Formation springs, it would be anticipated that the solute compositions of North Horn Formation springs would become similar to the Blackhawk Formation groundwater during the late season. This is not the case.

Similarly, the tritium contents of these springs are consistent with modern recharge and do not show significant late-season declines that could indicate a baseflow component derived from deeper aquifer systems.

Mayo and Associates (1996) determined that spring 10, unlike most other springs in the region, is supported by discharge from deeper groundwater systems. Spring 10 is believed to be associated with upwelling of groundwater along a fracture system that was encountered underground in the Soldier Canyon Mine. Radiocarbon dating of spring 10 groundwater indicates a mean groundwater residence time of approximately 10,000 years (Mayo and Associates, 1996). Tritium concentrations at spring 10 measured during 2002 were low,

ranging from 0 to 2 TU. The discharge from spring 10 shows a gradual decline during 2002 (Figure 5h), suggesting that there is some component of modern recharge to the spring. The solute composition of groundwater from spring 10 is similar to groundwaters encountered in some portions of the Soldier Canyon Mine, suggesting similar geochemical evolutionary pathways.

Castlegate Sandstone

A single spring from the Castlegate Sandstone (spring 227) was monitored during 2002. This spring was dry throughout the 2002 monitoring (Figure 5n). This indicates that there is not a deep source of groundwater that can sustain discharge from the spring during drought conditions.

7.0 Potential for mining-related impacts to Flagstaff Limestone and North Horn Formation springs

As was discussed in Section 6, discharge, solute, and tritium data clearly demonstrate that springs in the Colton Formation, Flagstaff Limestone, and North Horn Formation are supported by local, shallow groundwater systems. Spring discharge from these formations is not supported from deep Blackhawk Formation groundwater systems such as those encountered in the Soldier Canyon and Dugout Canyon Mines. As was described by Mayo and Associates (1996) the deep Blackhawk Formation groundwater systems are not in hydraulic communication with the perched, shallow groundwater systems that overlie the Blackhawk Formation. This is evidenced by the very old groundwater encountered in the

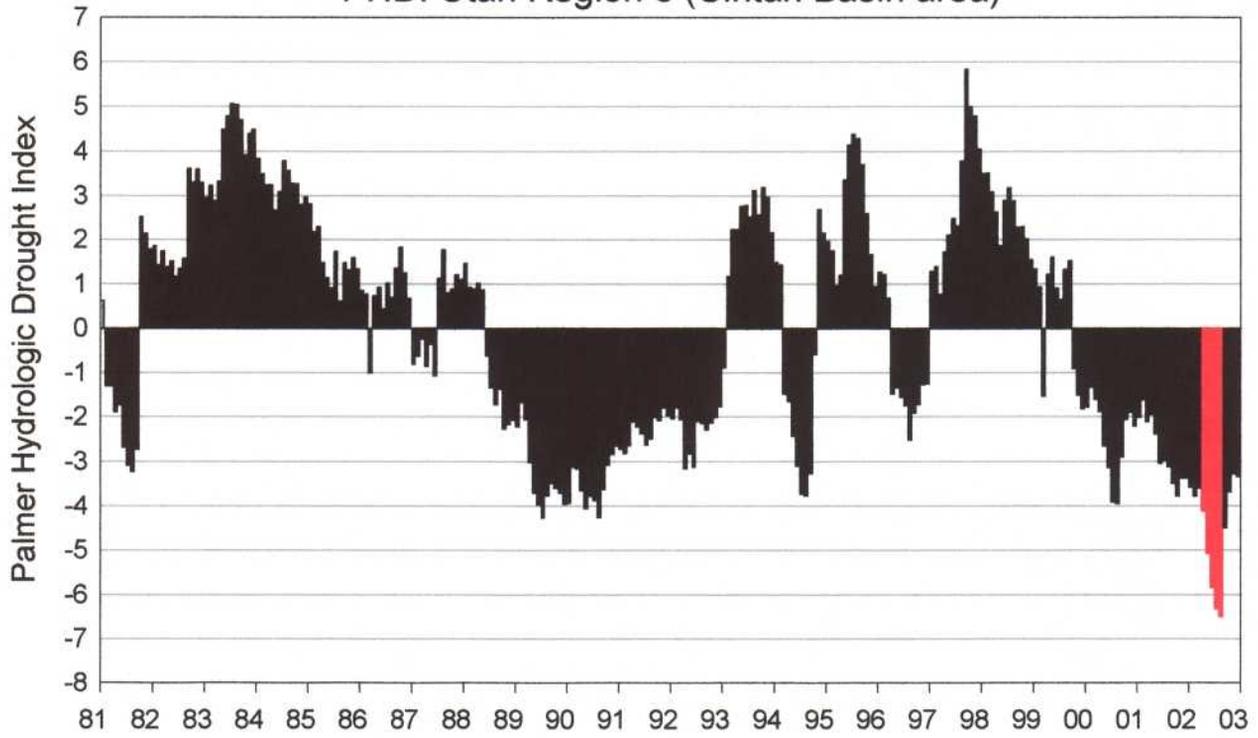
coal mines, and the lack of seasonal variability in groundwater discharge in the mine. Consequently, the interception and dewatering of deep Blackhawk Formation groundwater systems will likely have no impact on the discharge from springs in the Colton Formation, Flagstaff Limestone, North Horn Formation, or Castlegate Sandstone.

Mining has already been completed beneath spring 10 in the now sealed Soldier Canyon Mine. Impacts to discharge or water quality at spring 10 were not observed (Mayo and Associates, 1996).

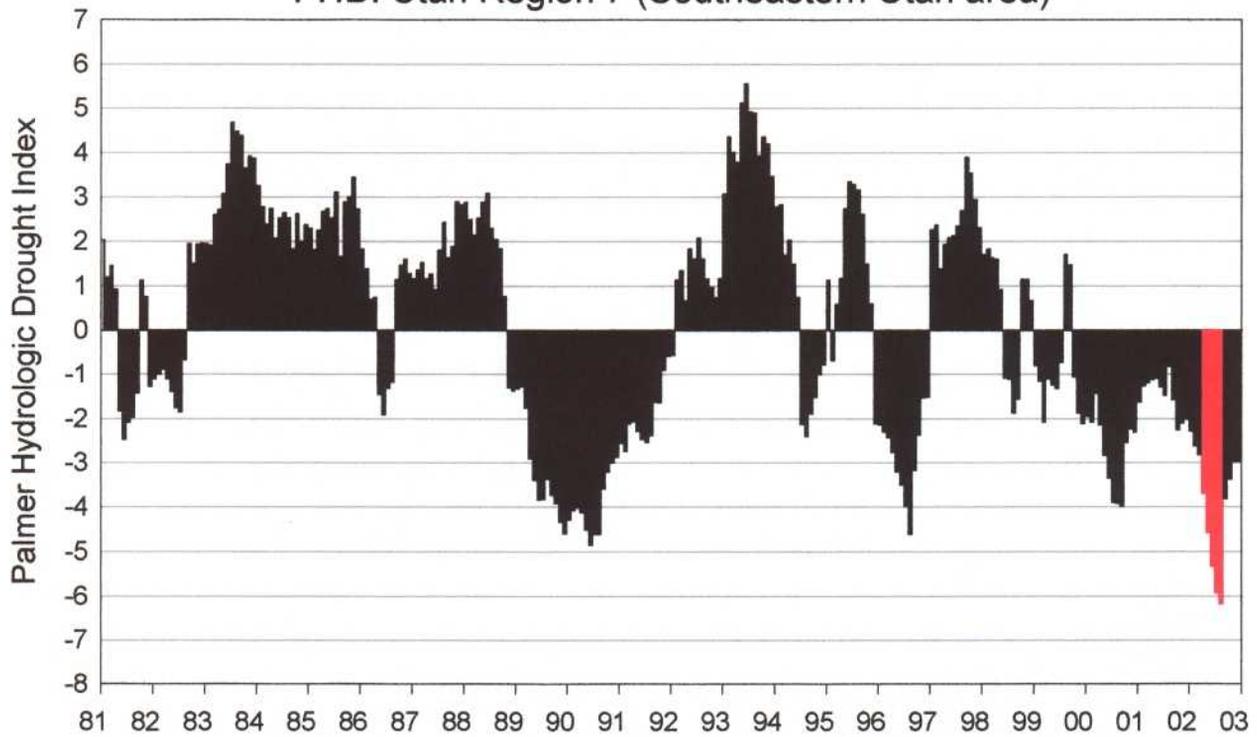
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PHDI Utah Region 6 (Uintah Basin area)



PHDI Utah Region 7 (Southeastern Utah area)



- | | |
|---------------------------|---------------------------|
| -1 to -2 Mild Drought | 1 to 2 Mild Wet Spell |
| -2 to -3 Moderate Drought | 2 to 3 Moderate Wet Spell |
| -3 to -4 Severe Drought | 3 to 4 Severe Wet Spell |
| -4 to -5 Extreme Drought | 4 to 5 Extreme Wet Spell |

Figure 2 Palmer Hydrologic Drought Index, Utah Region 6 and 7.
Time period of 2002 hydrologic monitoring shown in red.

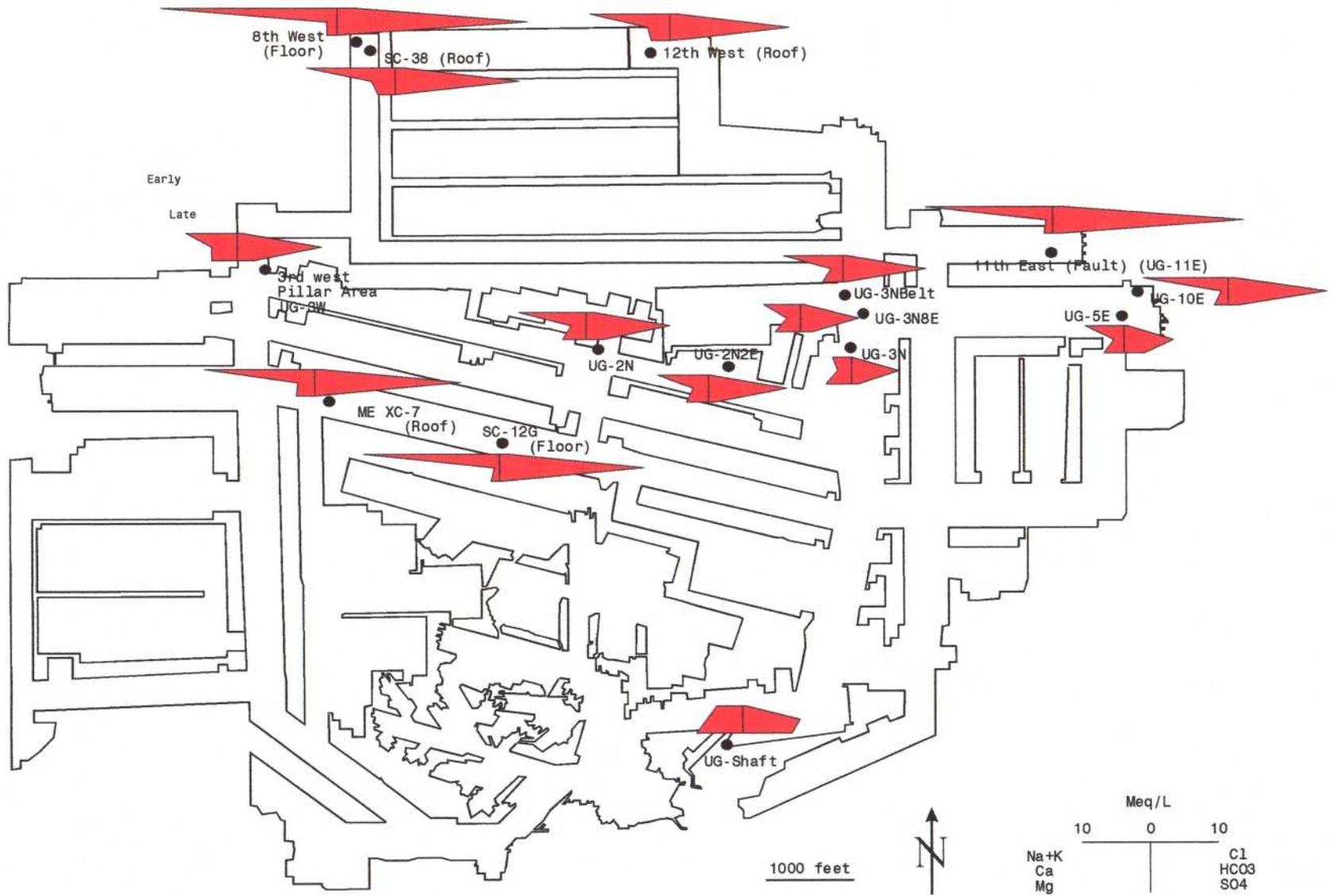


Figure 4 Stiff diagrams of the solute compositions of Soldier Canyon Mine groundwaters.
(Data from Soldier Canyon monitoring data and Mayo and Associates 1995 sampling)

SC-65

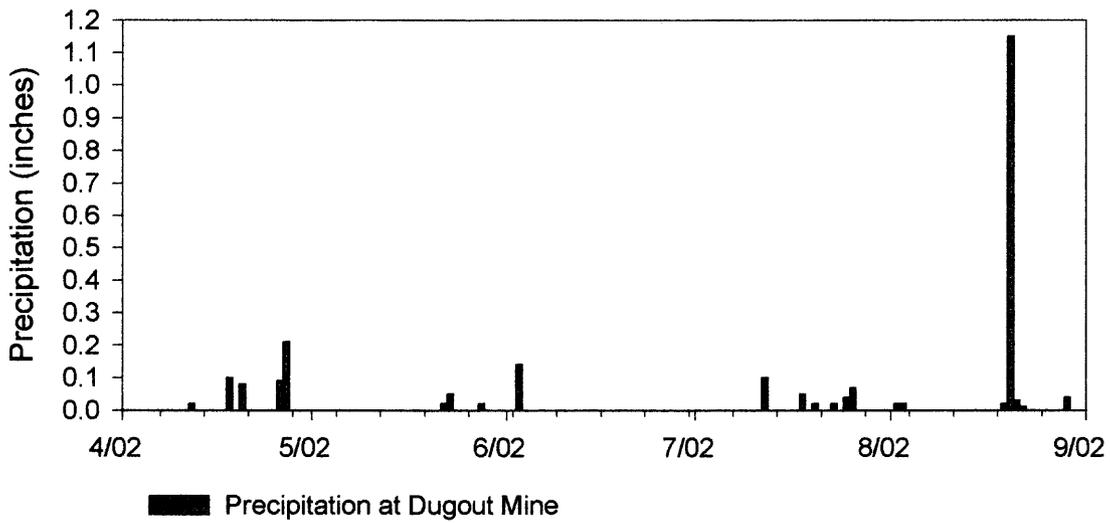
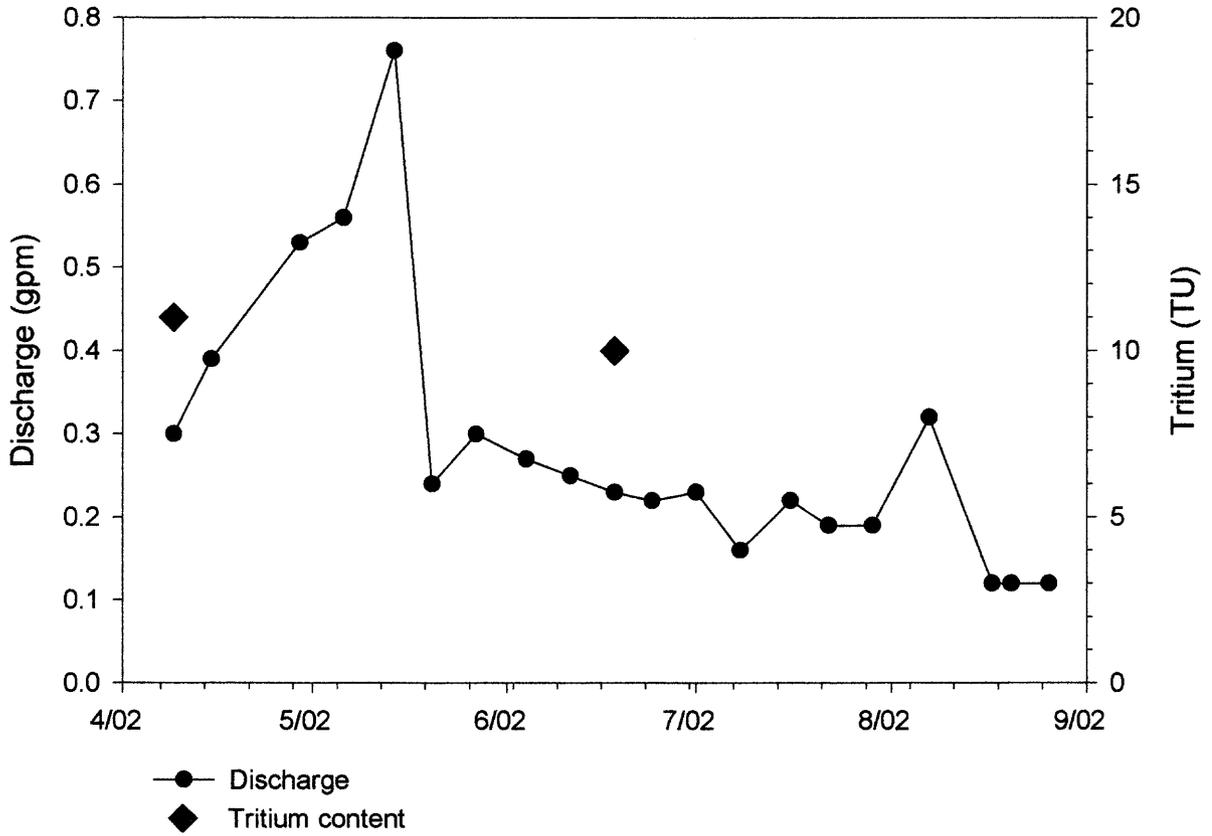


Figure 5a Plots of discharge and tritium content at SC-65, and precipitation at the Dugout Mine rain gauge.

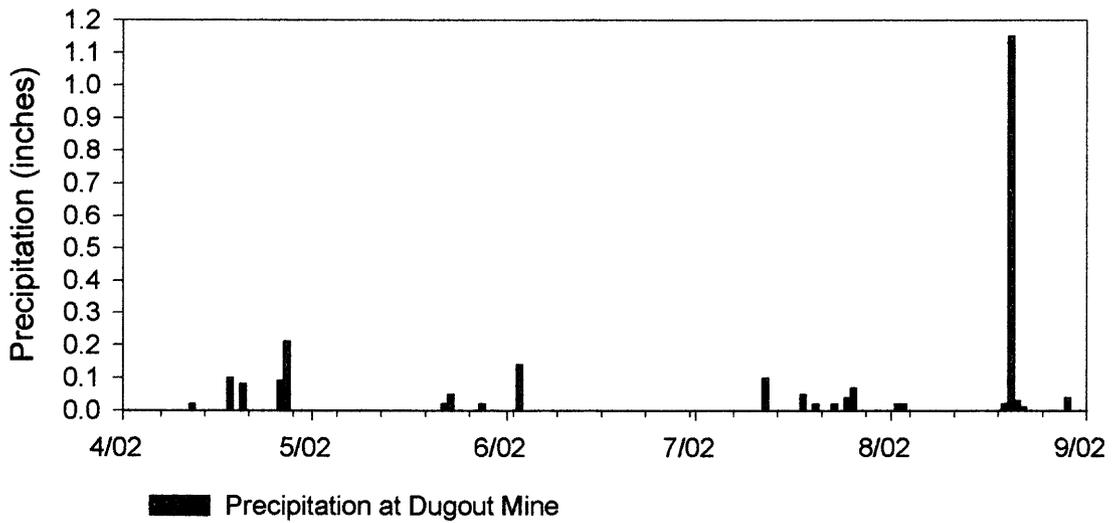
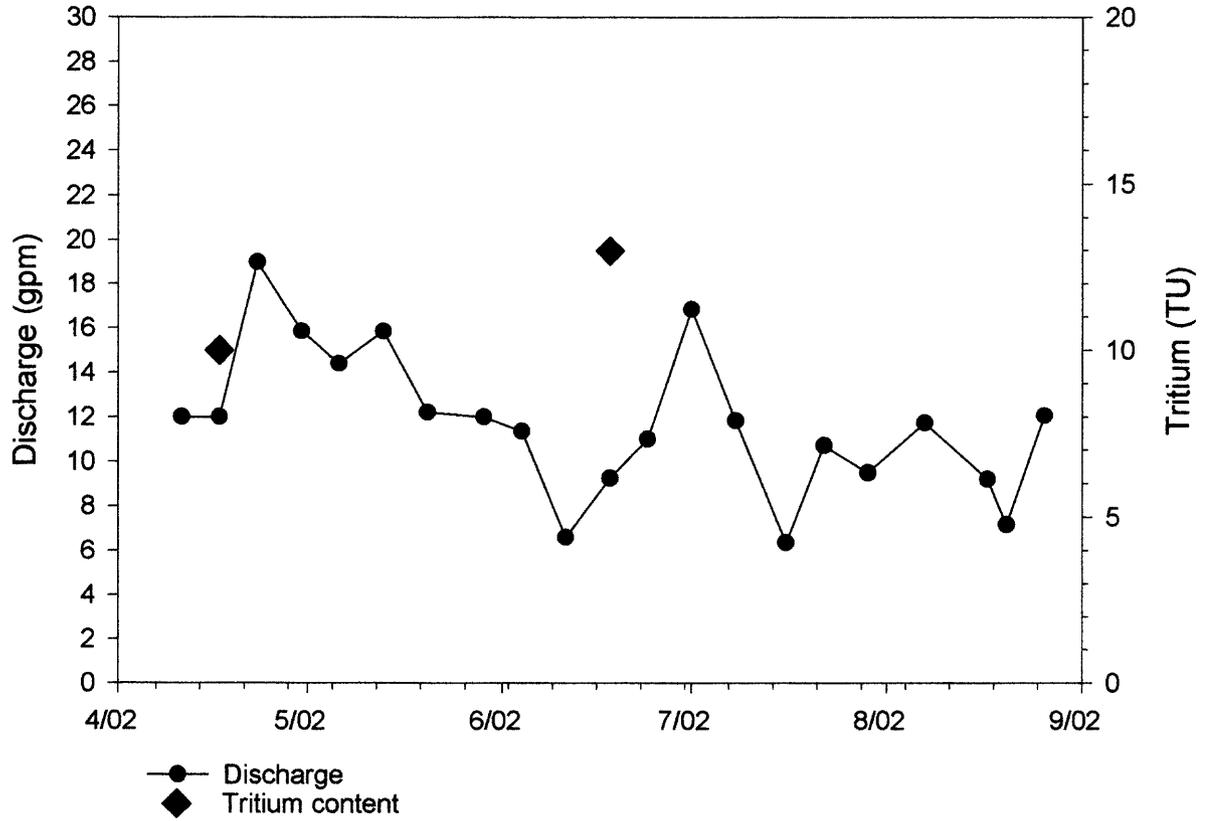


Figure 5b Plots of discharge and tritium content at site 260, and precipitation at the Dugout Mine rain gauge.

SP-20

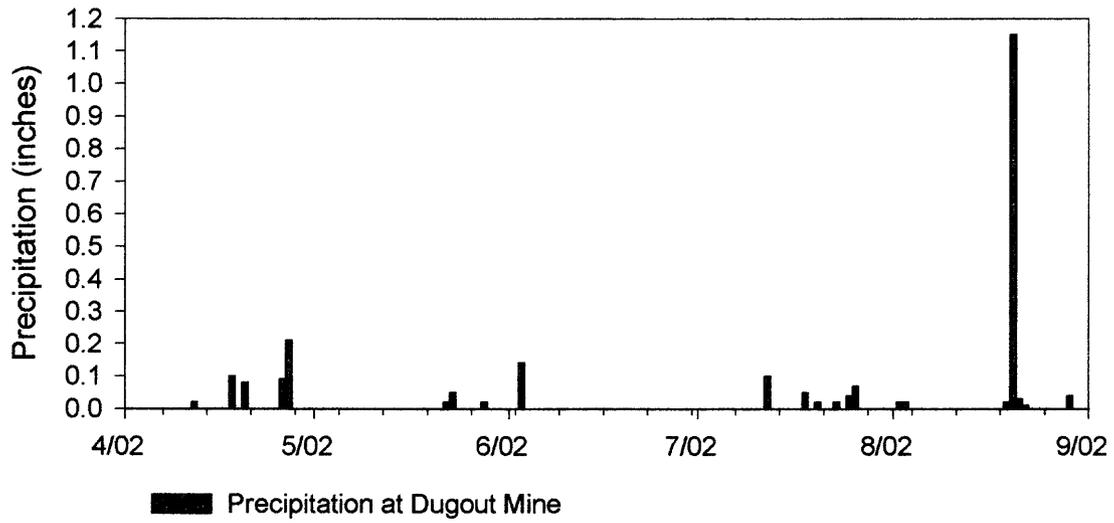
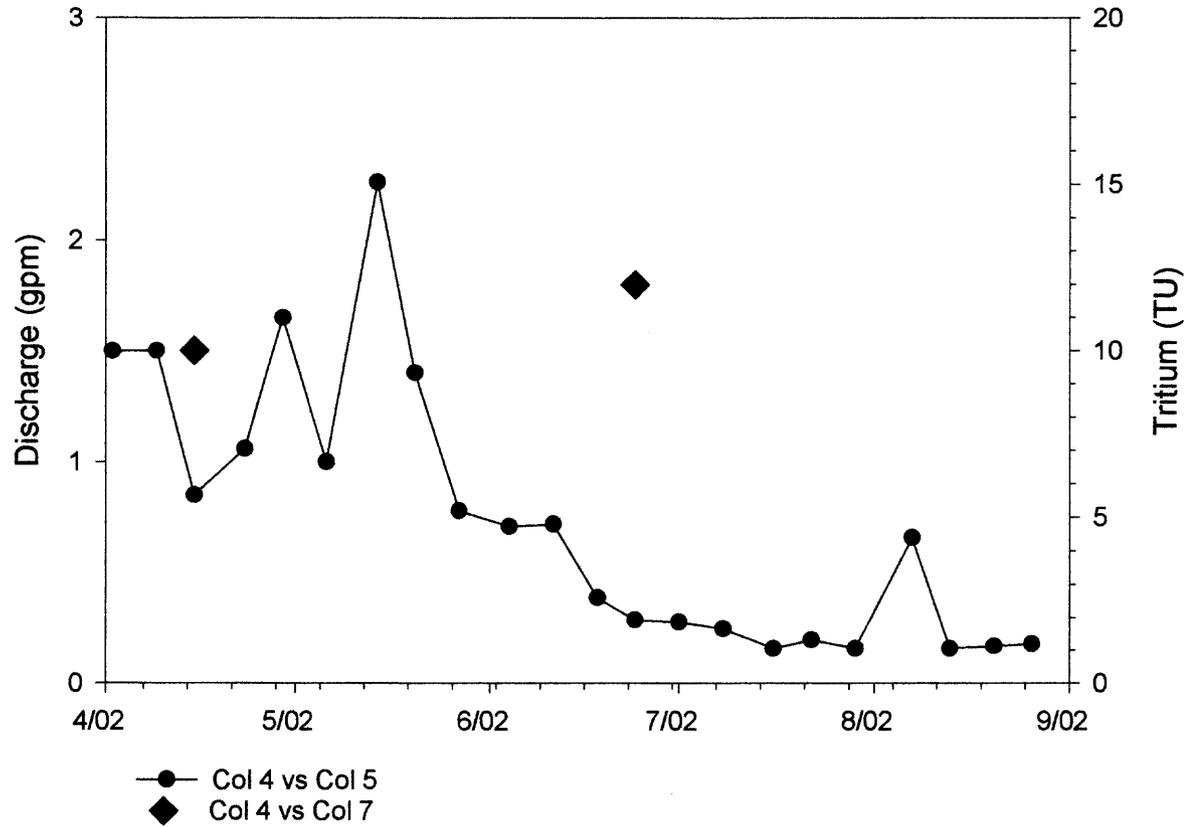


Figure 5c Plots of discharge and tritium content at SP-20, and precipitation at the Dugout Mine rain gauge.

SC-100

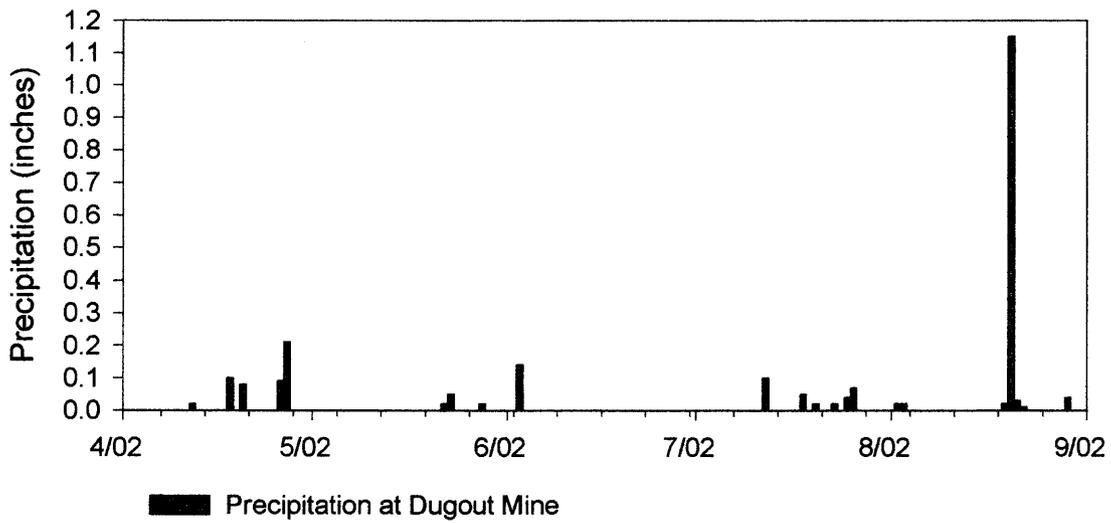
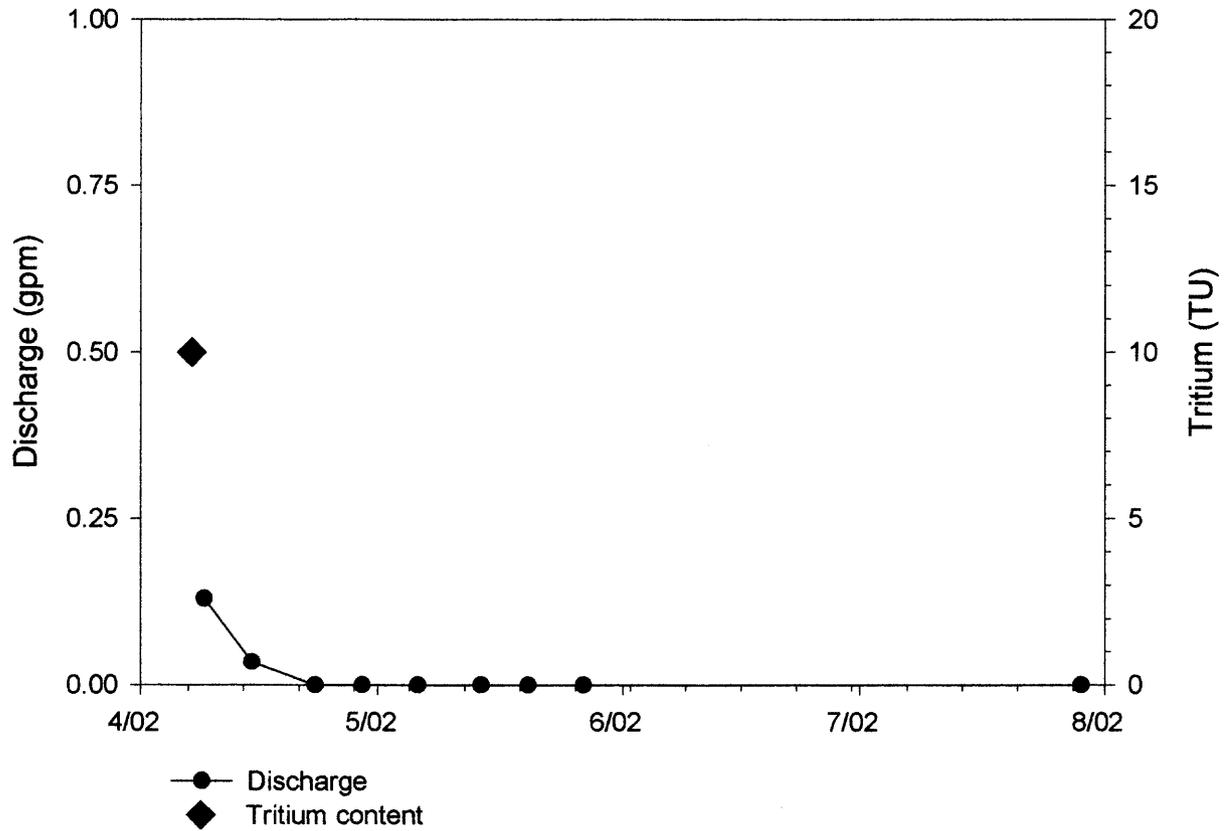


Figure 5d Plots of discharge and tritium content at SC-100, and precipitation at the Dugout Mine rain guage.

SC-116

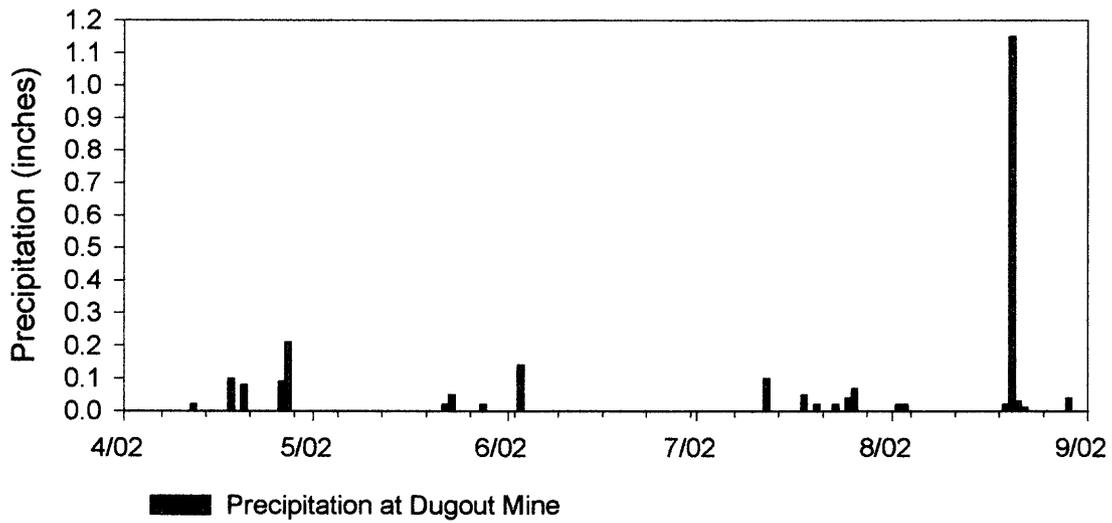
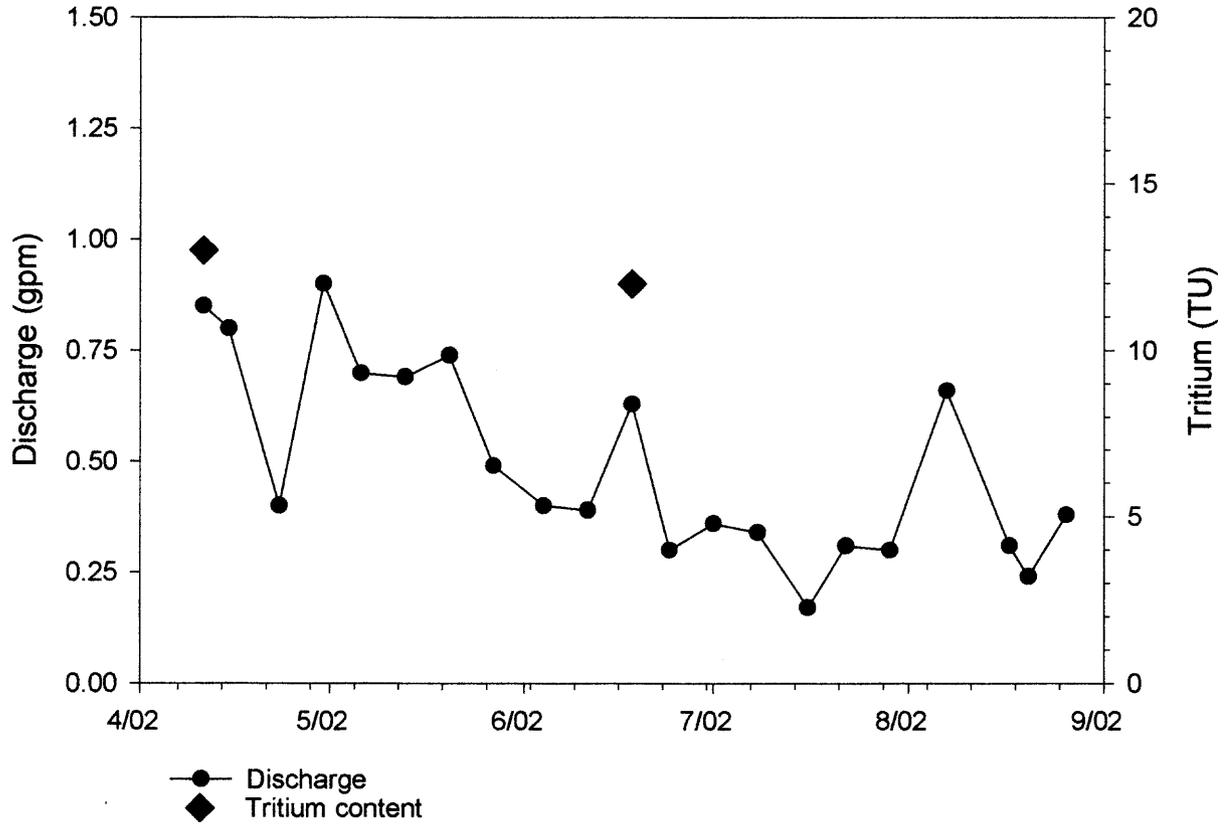


Figure 5e Plots of discharge and tritium content at SC-116, and precipitation at the Dugout Mine rain gauge.

SC-14

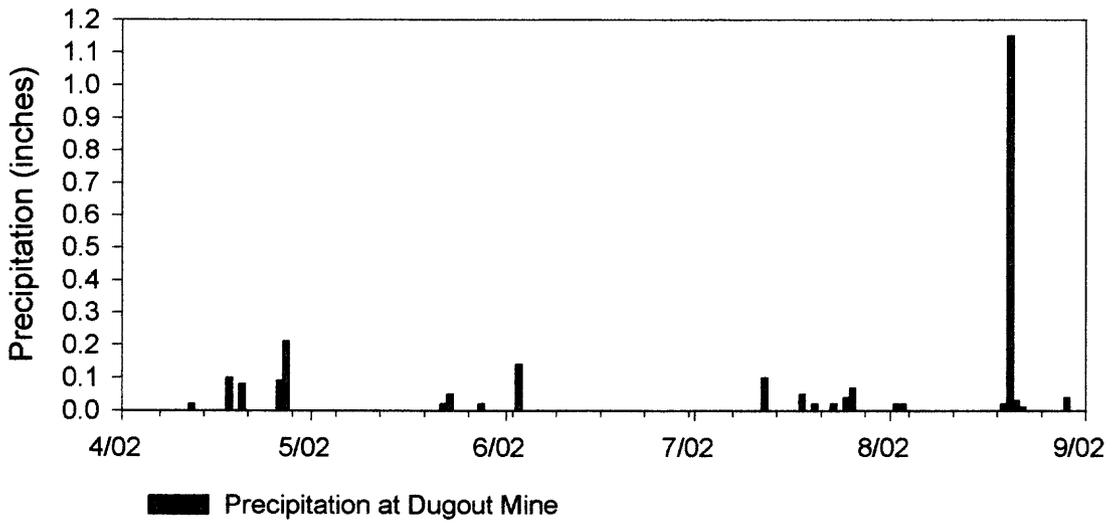
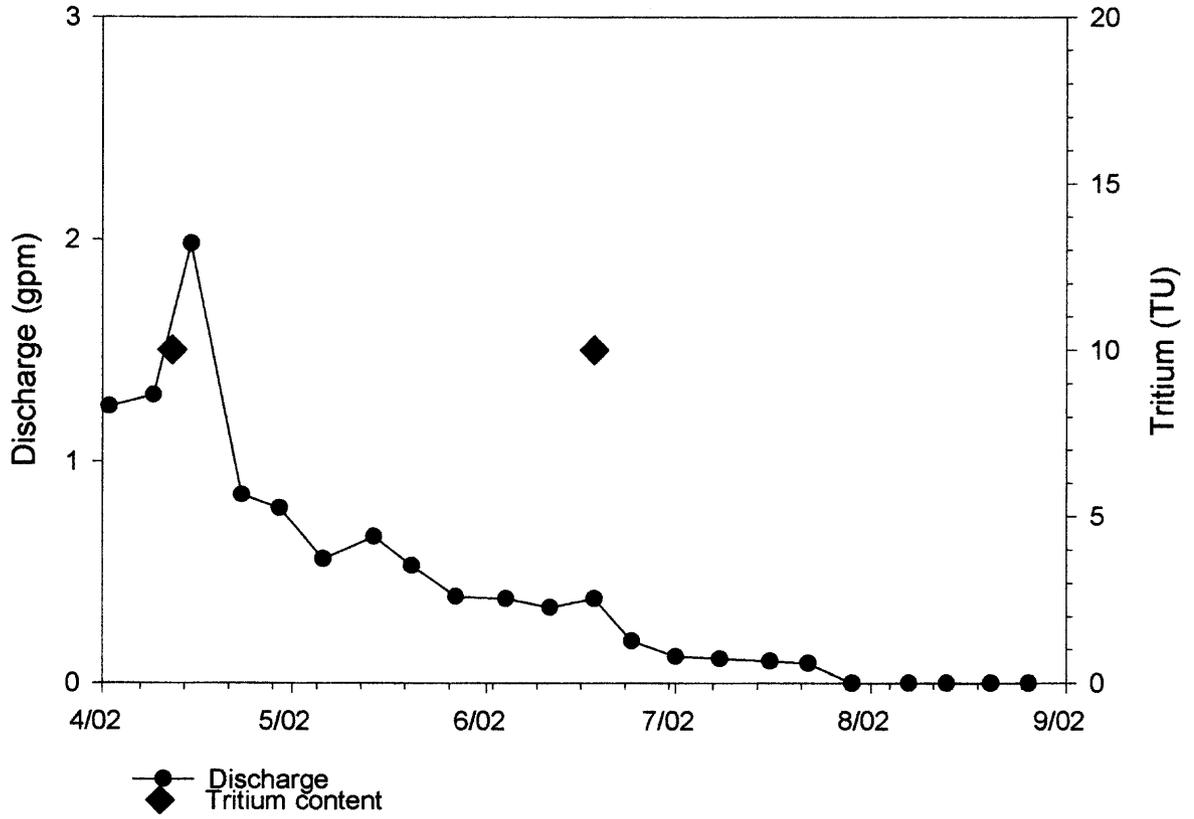


Figure 5f Plots of discharge and tritium content at SC-14, and precipitation at the Dugout Mine rain gauge.

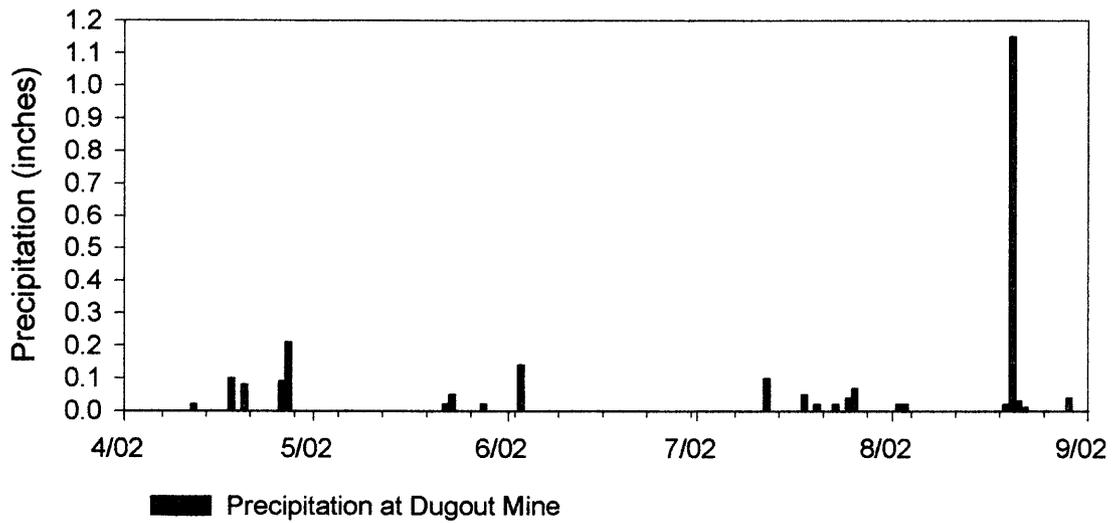
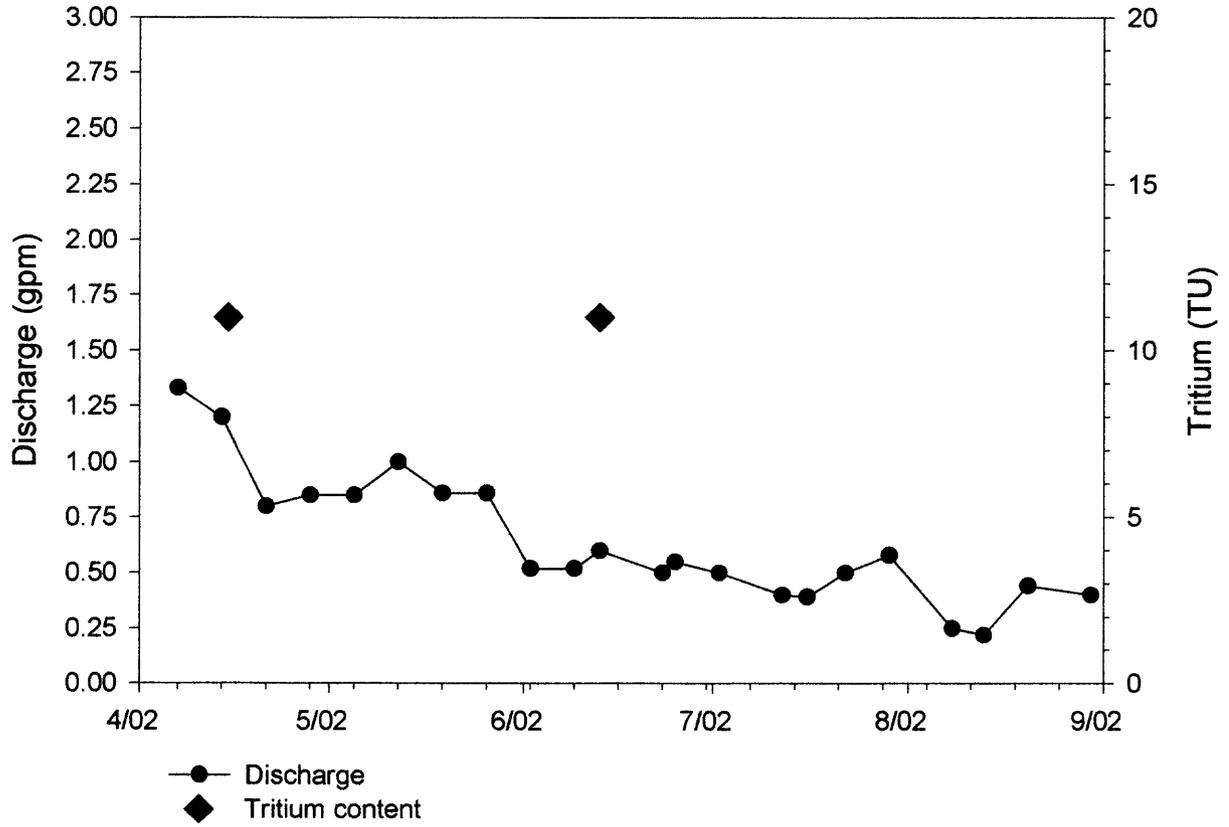


Figure 5g Plots of discharge and tritium content at site 5, and precipitation at the Dugout Mine rain gauge.

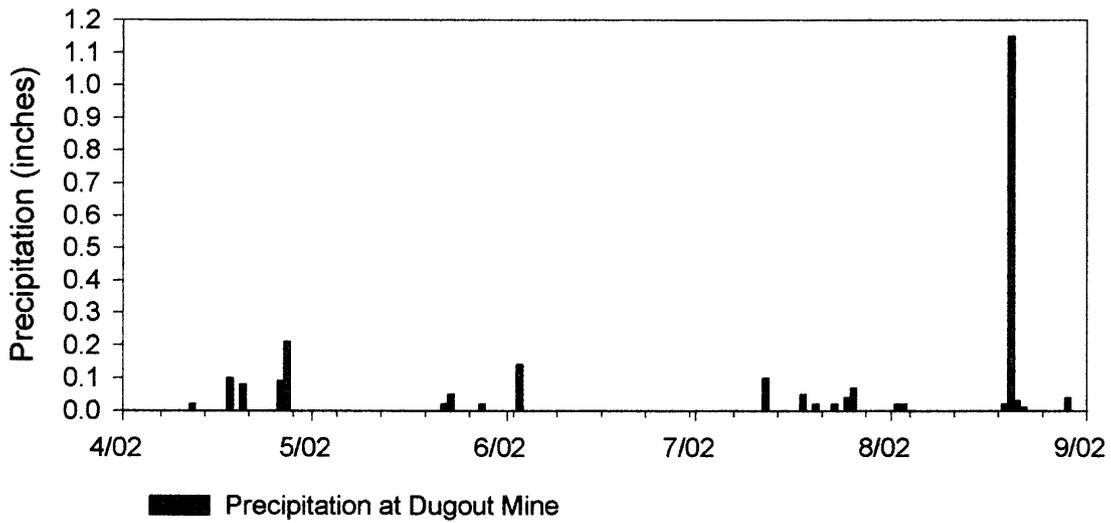
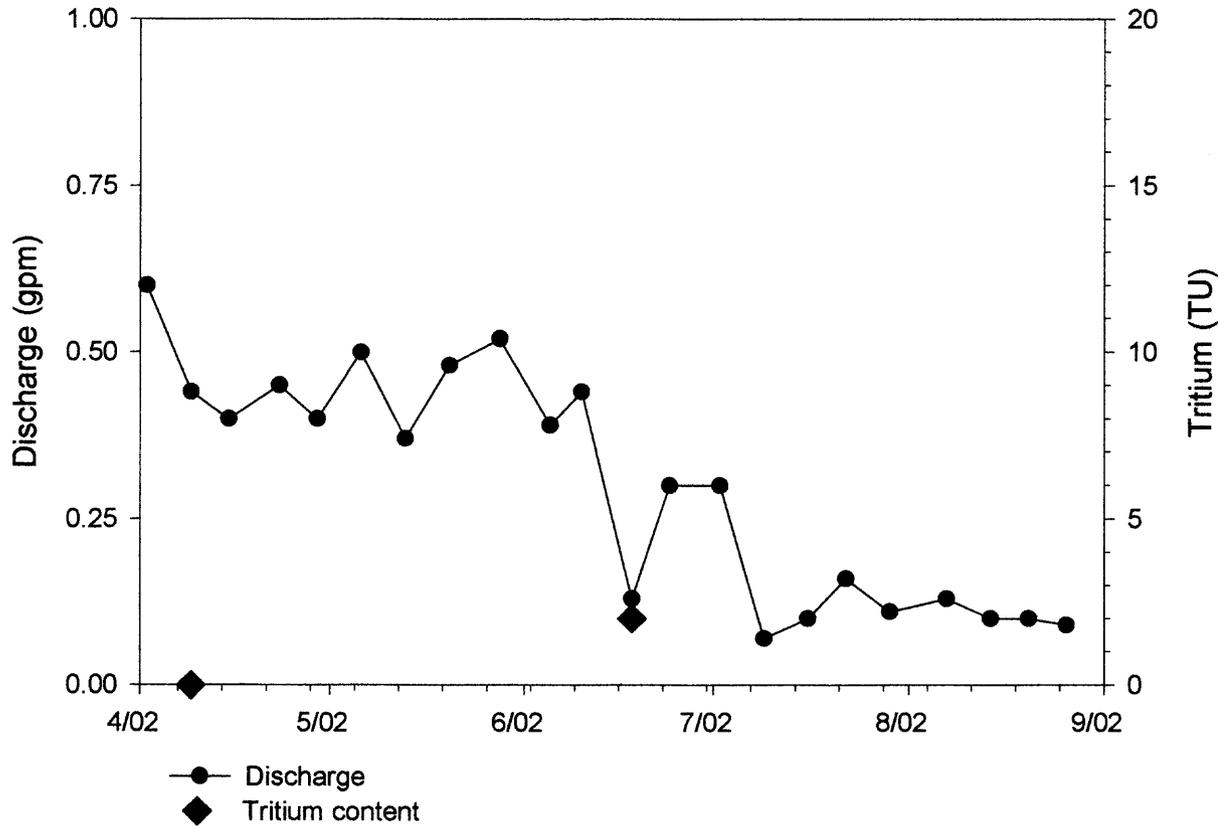


Figure 5h Plots of discharge and tritium content at site 10, and precipitation at the Dugout Mine rain gauge.

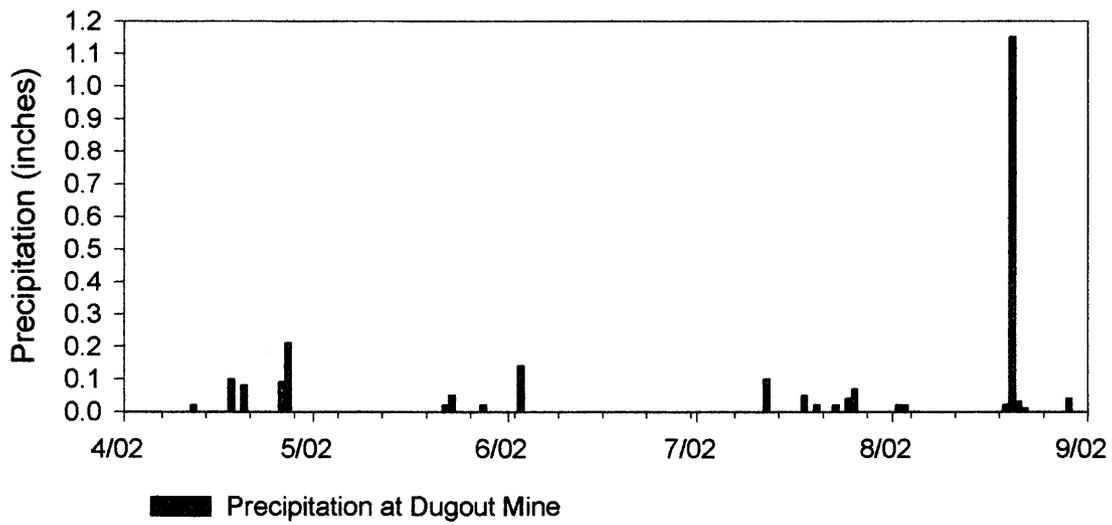
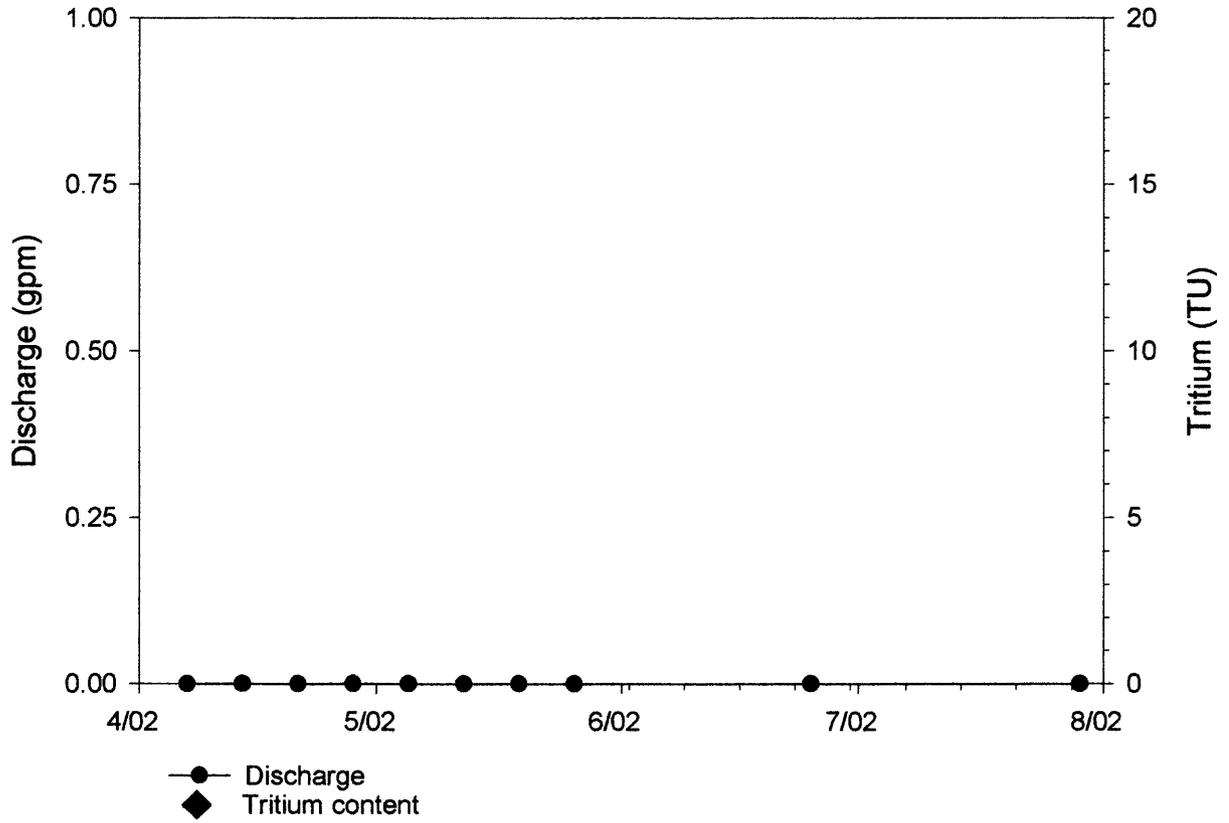


Figure 5i Plots of discharge and tritium content at site 23, and precipitation at the Dugout Mine rain guage.

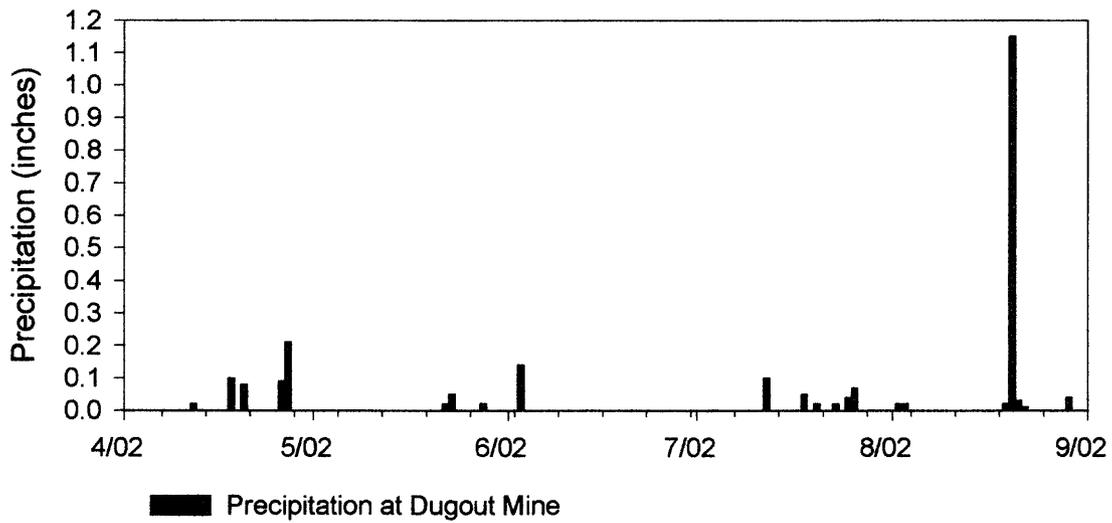
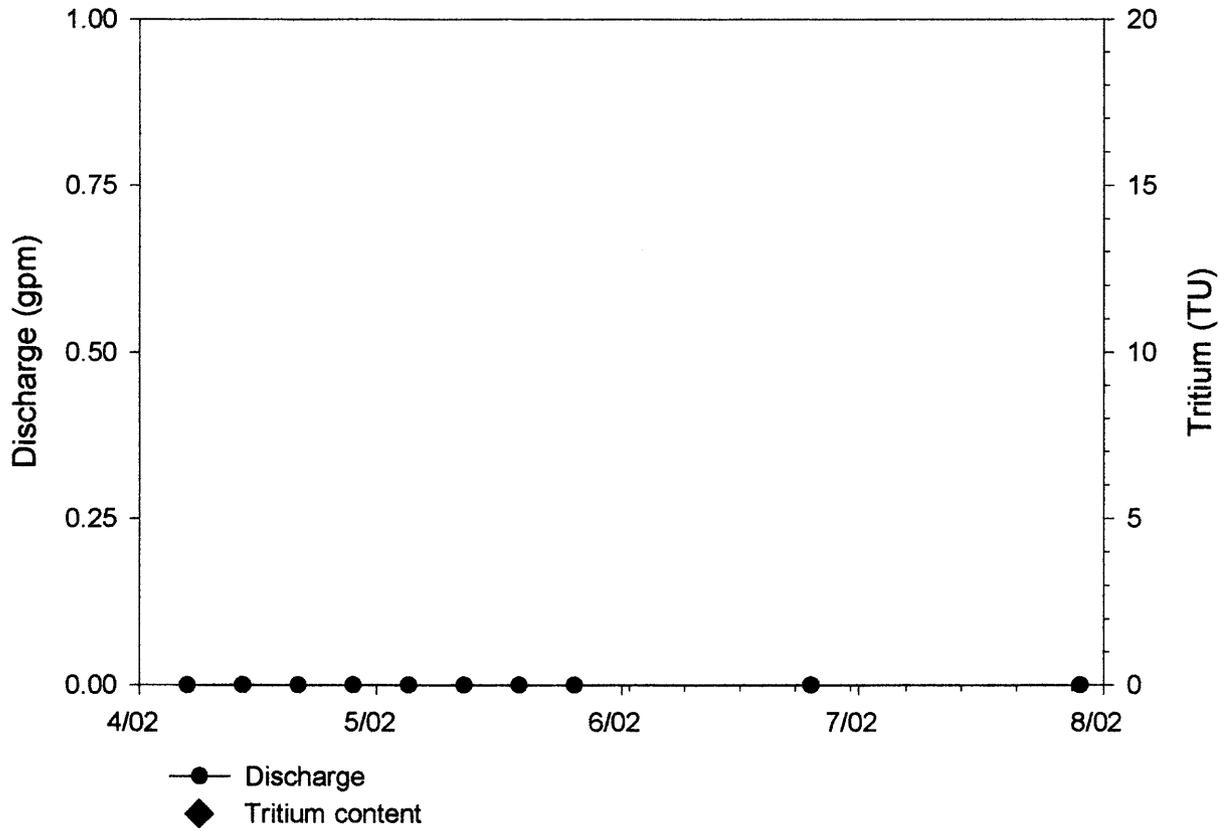


Figure 5j Plots of discharge and tritium content at site 24, and precipitation at the Dugout Mine rain gauge.

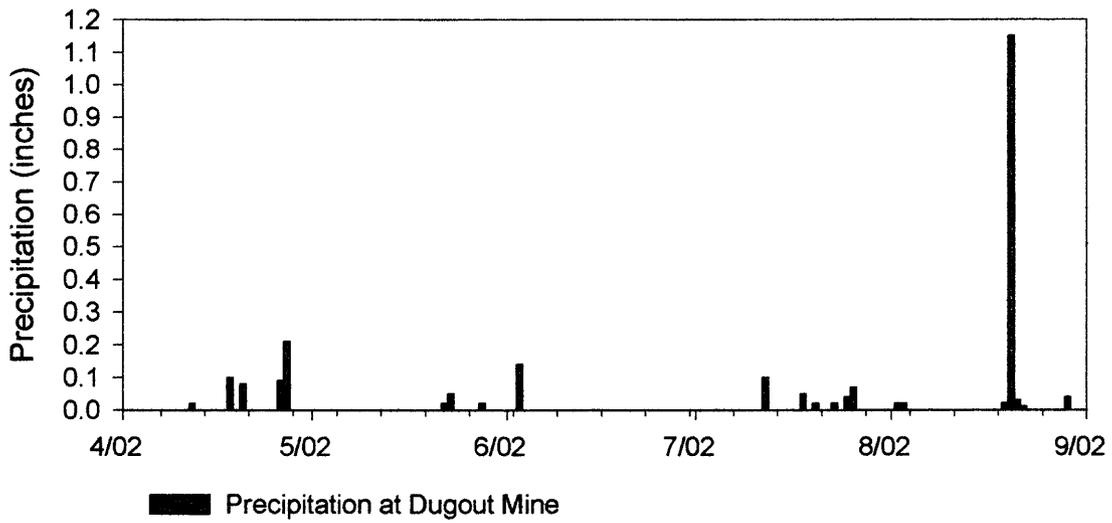
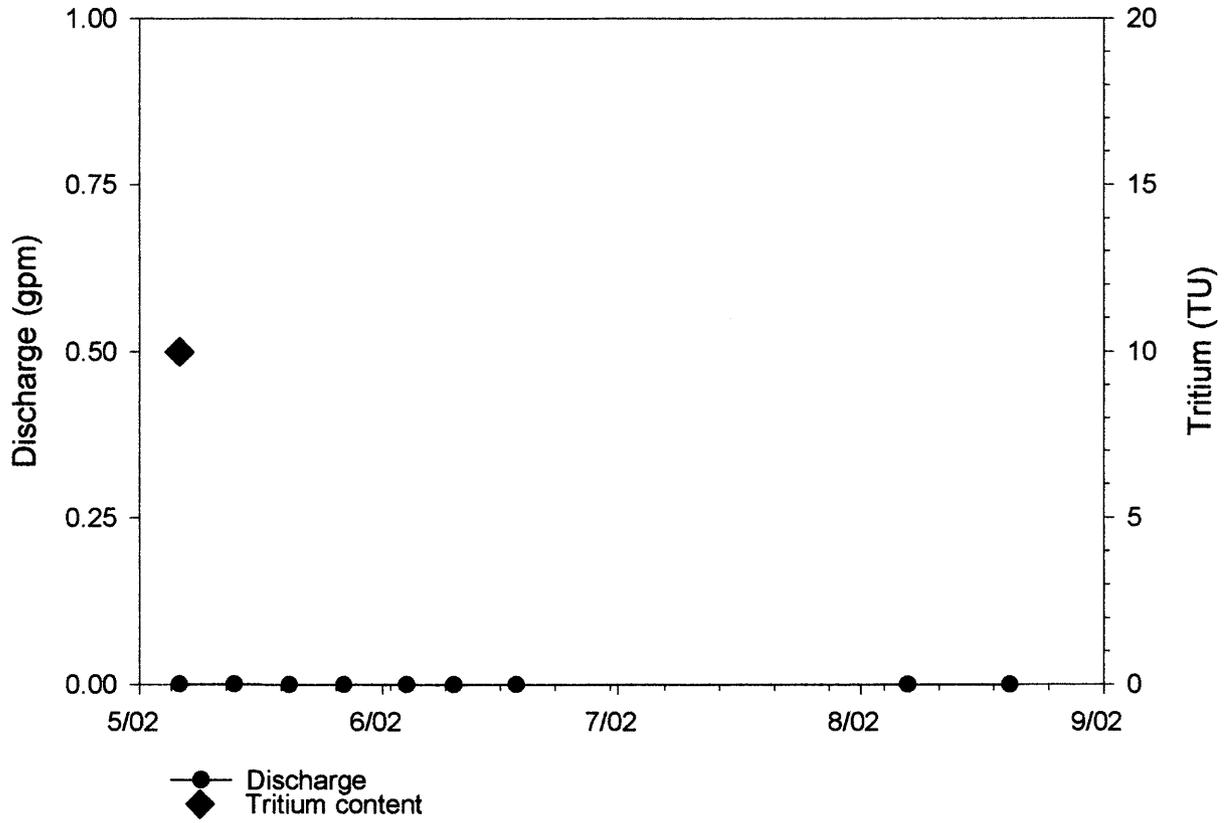


Figure 5k Plots of discharge and tritium content at site 200, and precipitation at the Dugout Mine rain gauge.

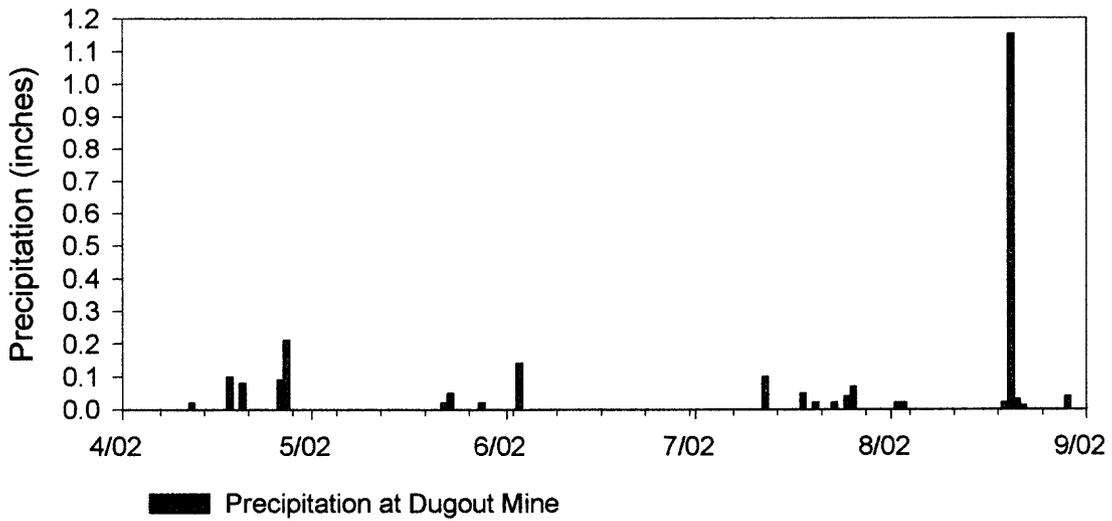
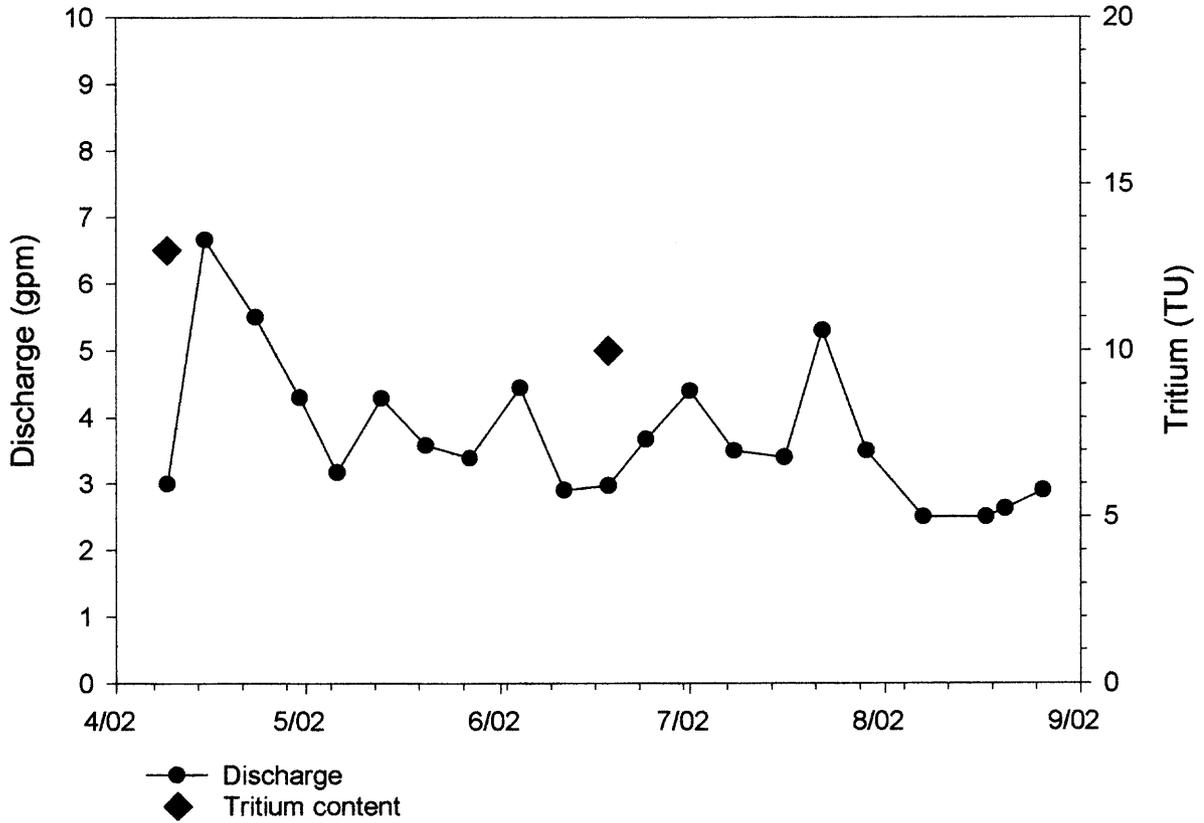


Figure 5I Plots of discharge and tritium content at site 203, and precipitation at the Dugout Mine rain gauge.

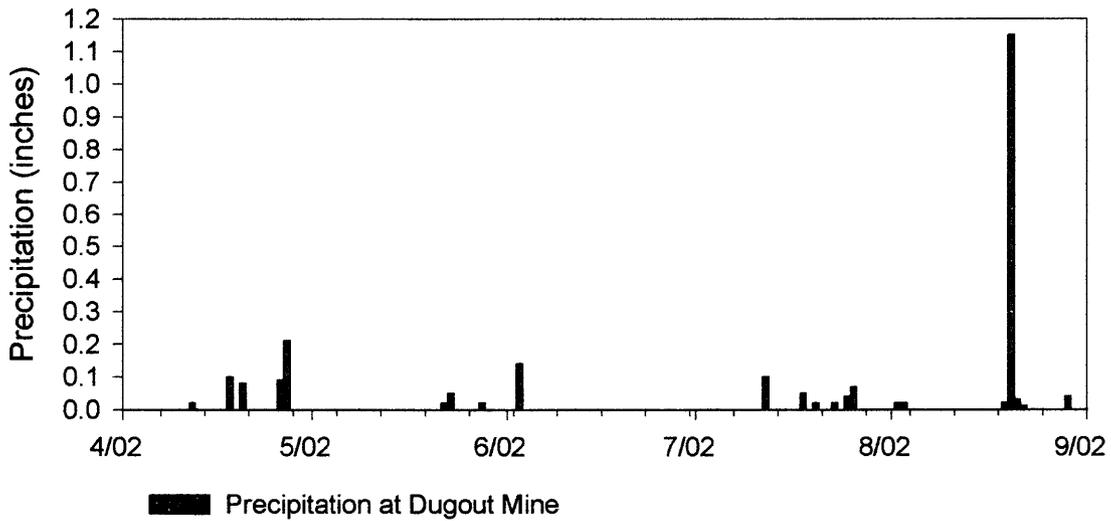
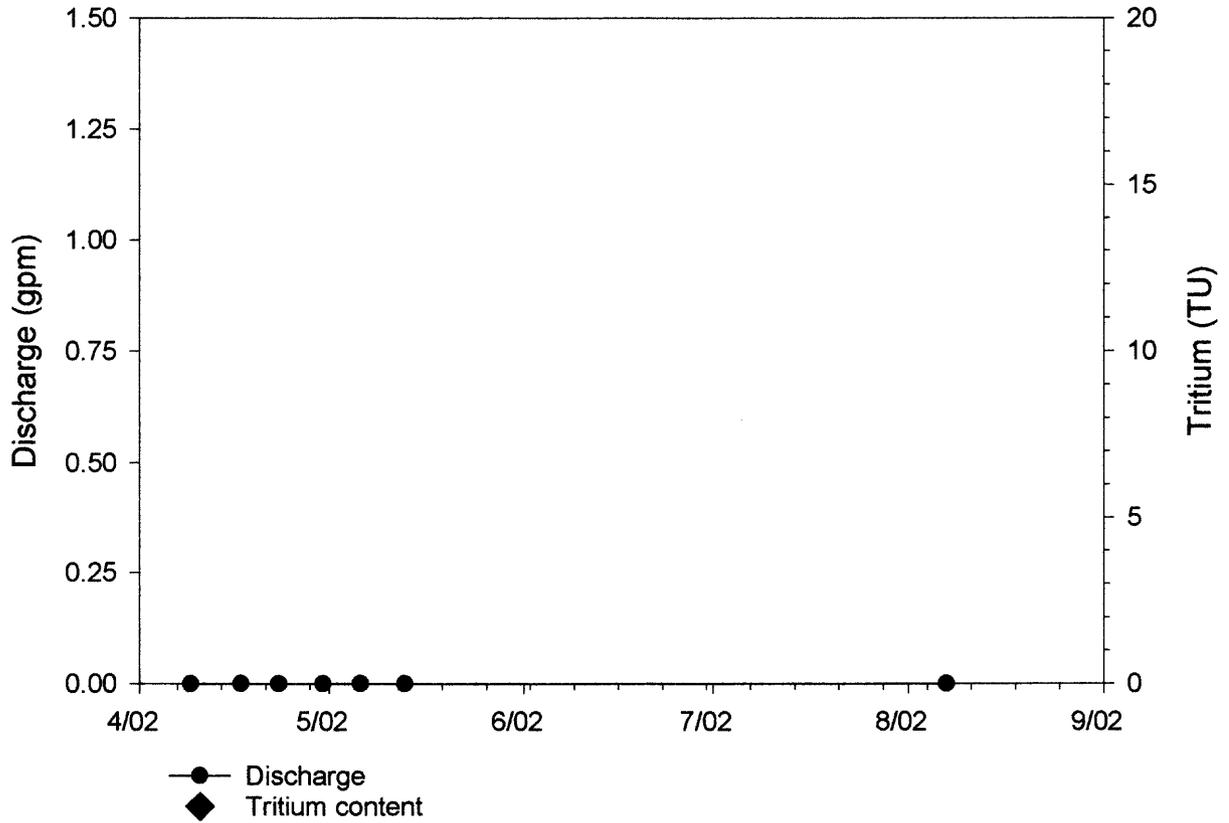


Figure 5m Plots of discharge and tritium content at site 259, and precipitation at the Dugout Mine rain gauge.

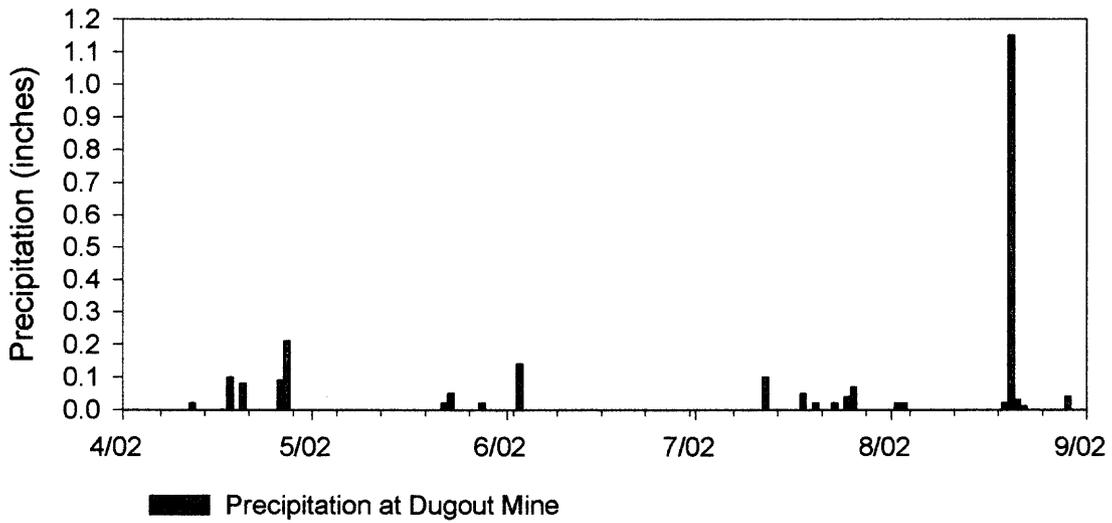
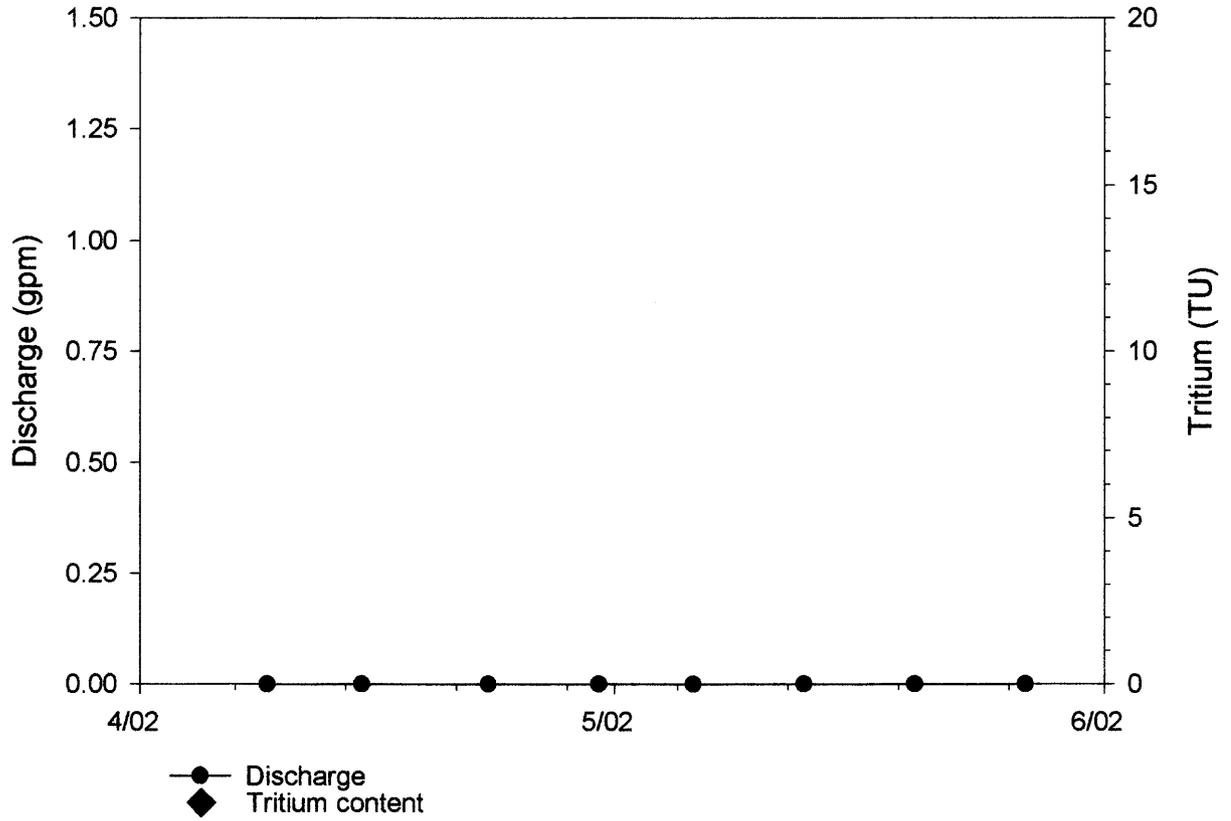


Figure 5n Plots of discharge and tritium content at site 227, and precipitation at the Dugout Mine rain gauge.

G-6

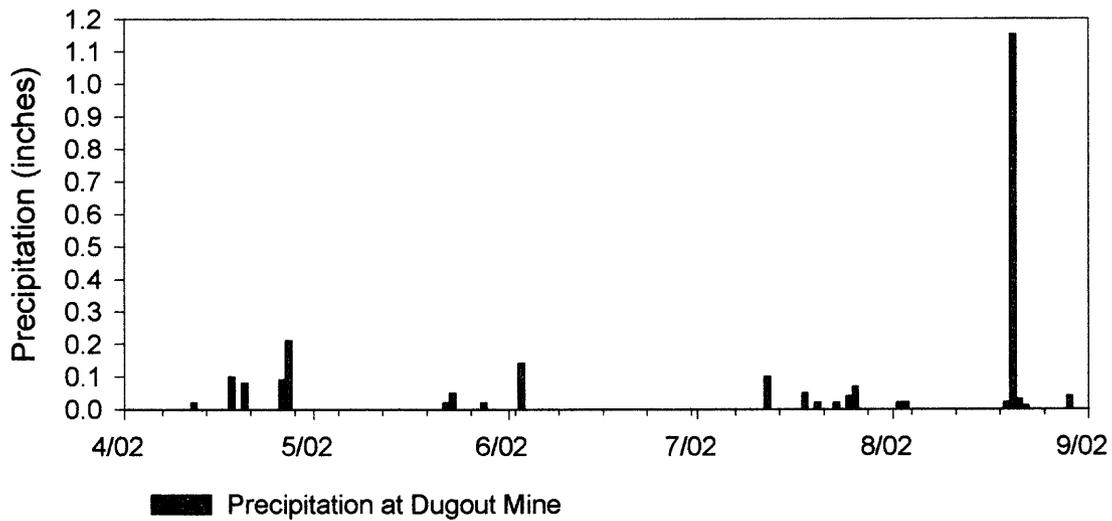
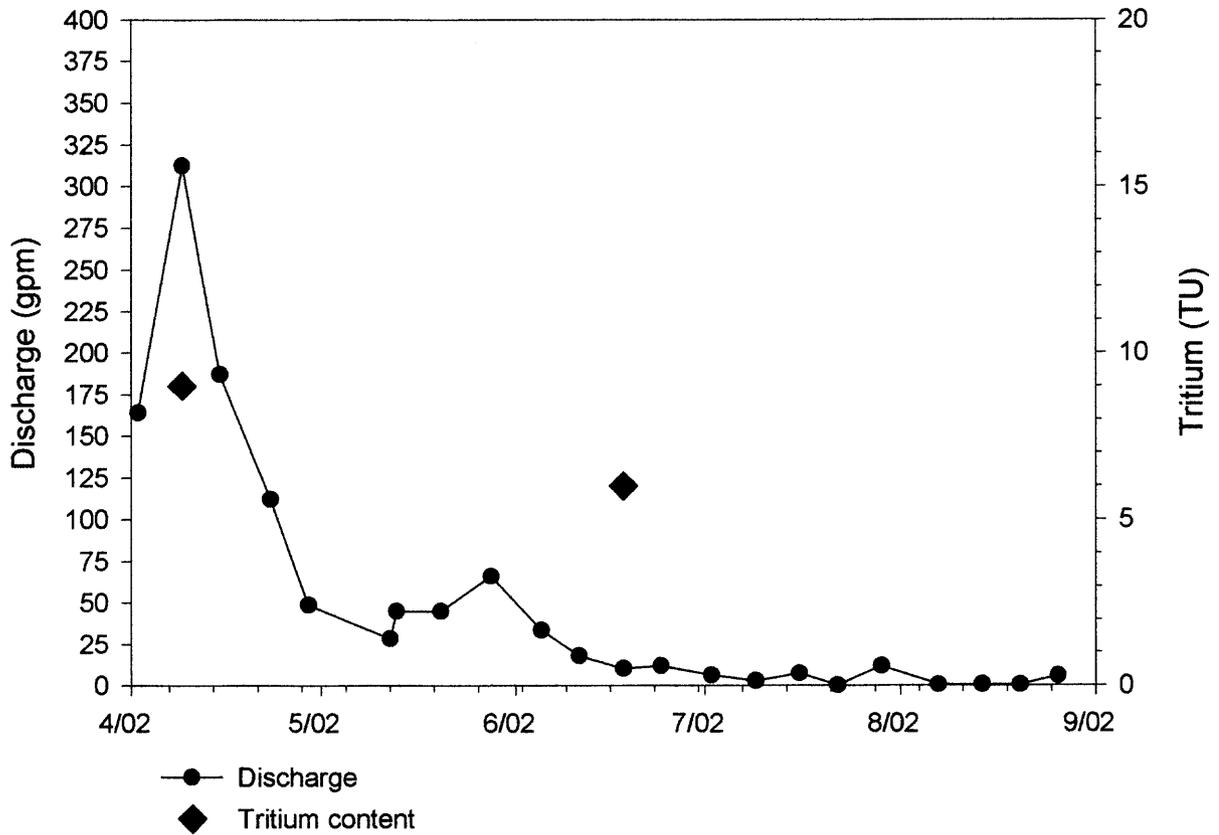


Figure 5o Plots of discharge and tritium content at G-6, and precipitation at the Dugout Mine rain gauge.

G-7

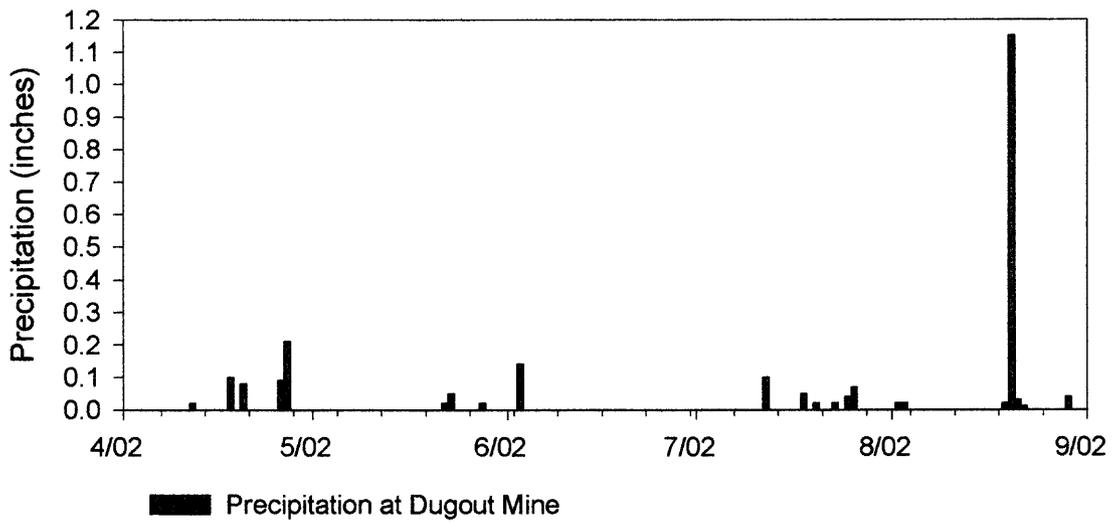
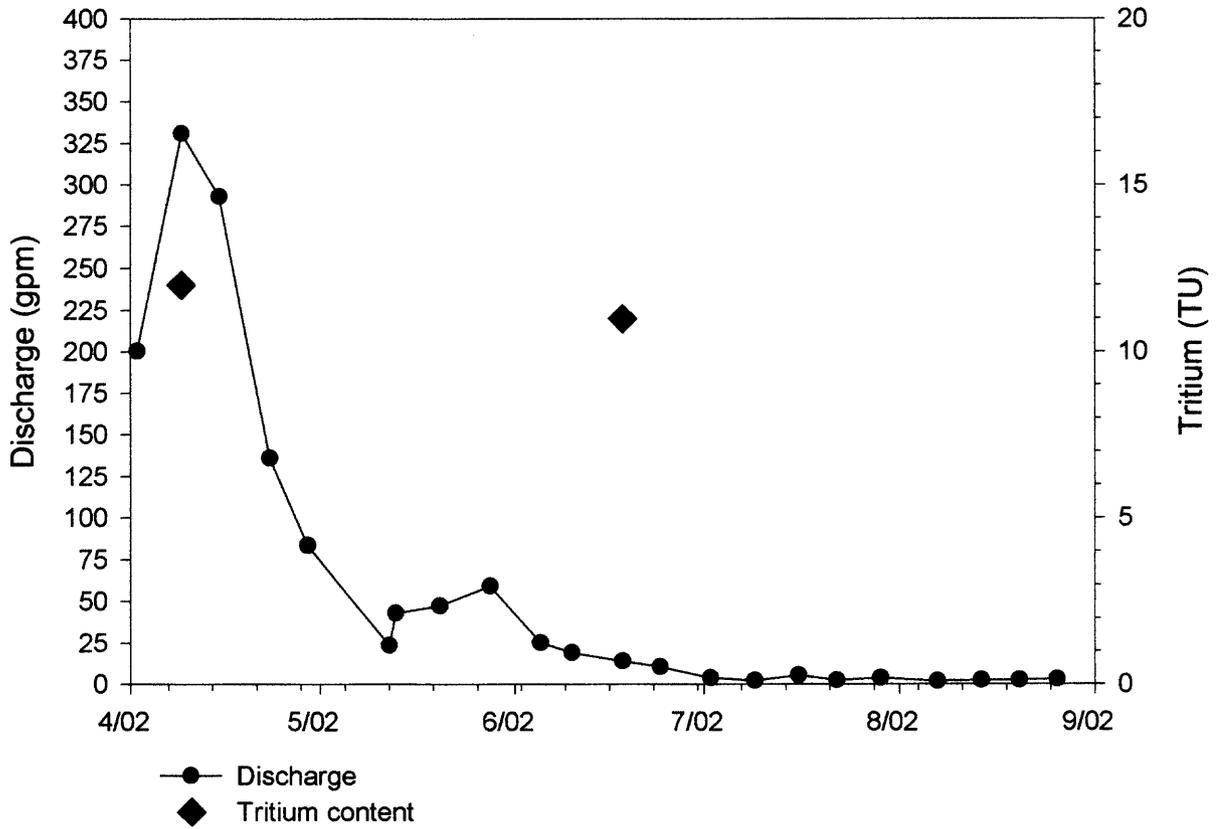


Figure 5p Plots of discharge and tritium content at G-7, and precipitation at the Dugout Mine rain guage.

DC-2

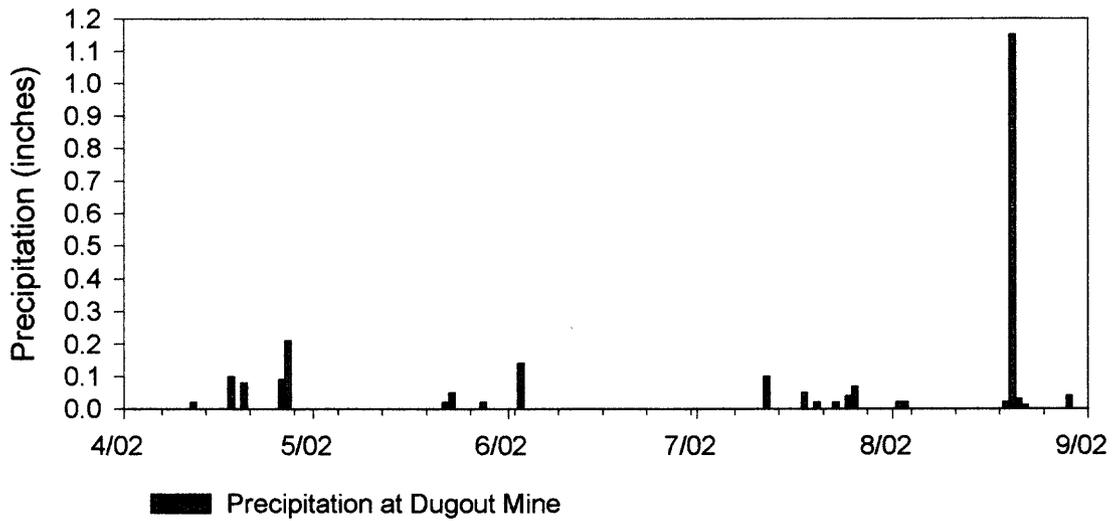
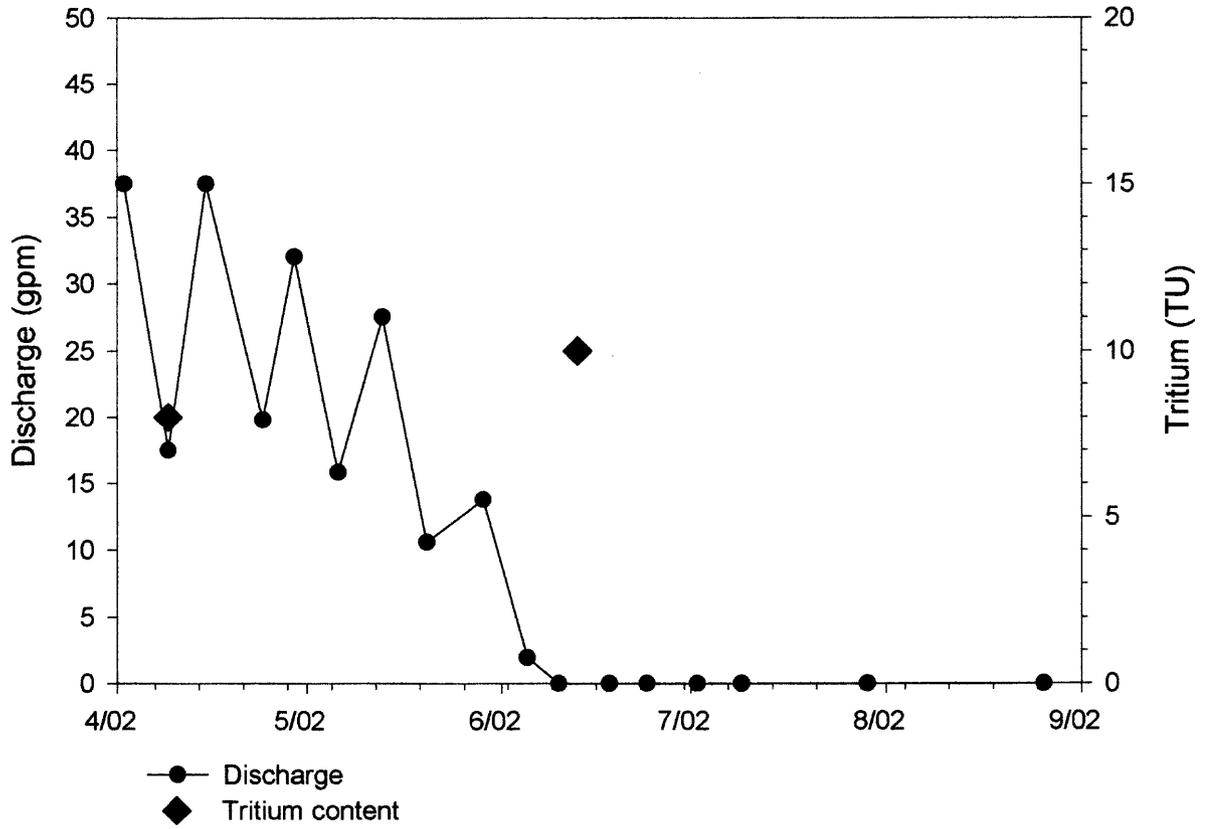


Figure 5q Plots of discharge and tritium content at DC-2, and precipitation at the Dugout Mine rain gauge.

DC-3

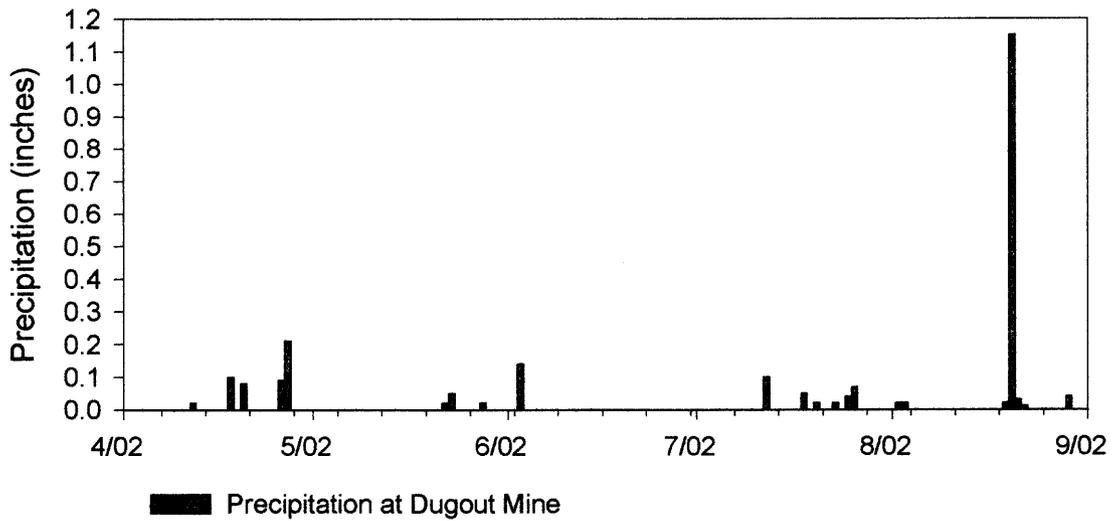
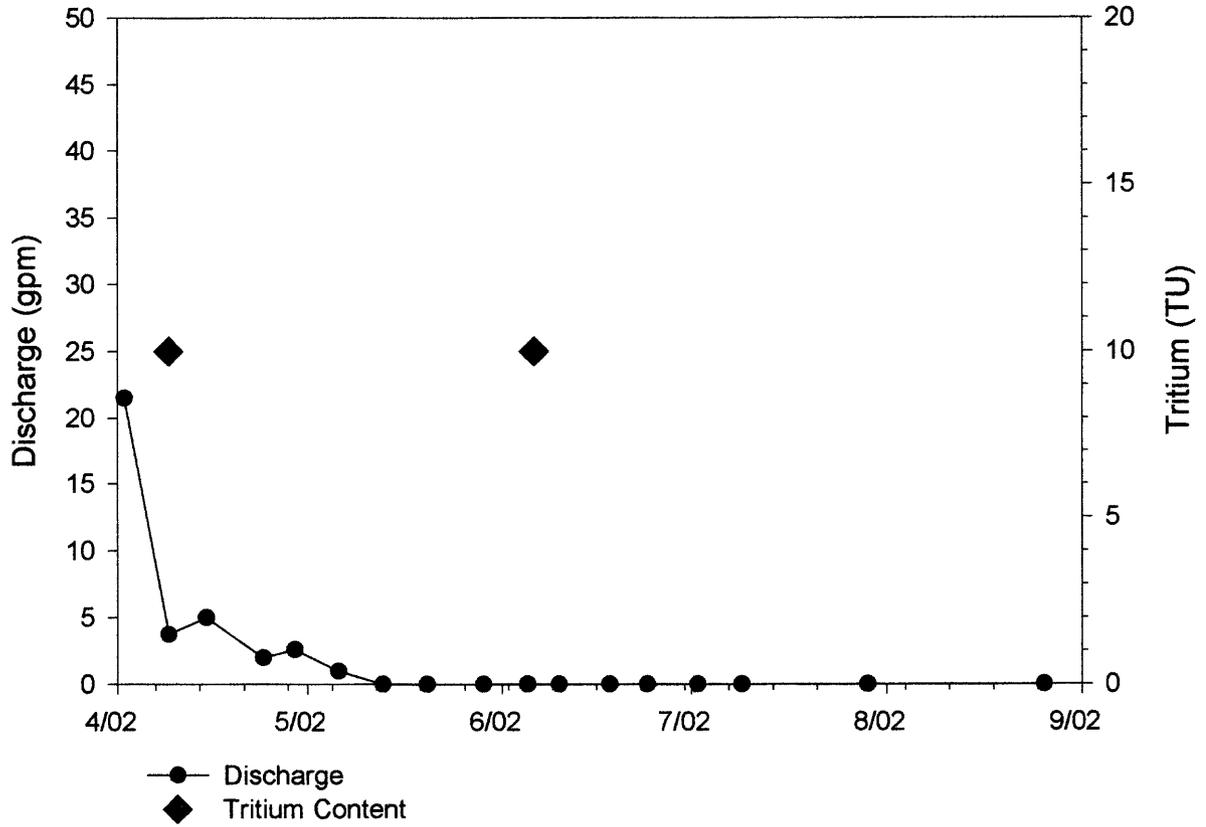


Figure 5r Plots of discharge and tritium content at DC-3, and precipitation at the Dugout Mine rain guage.

DC-4

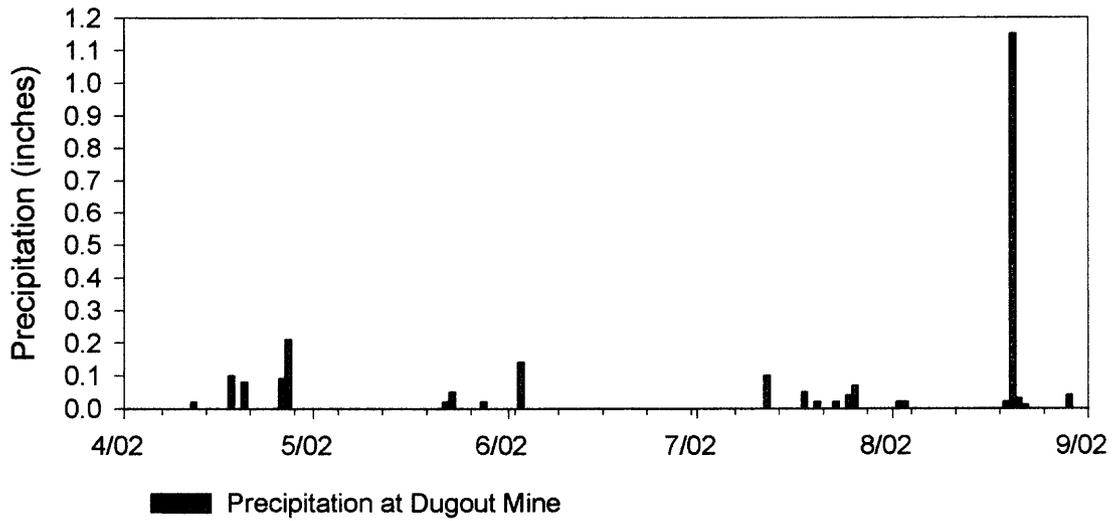
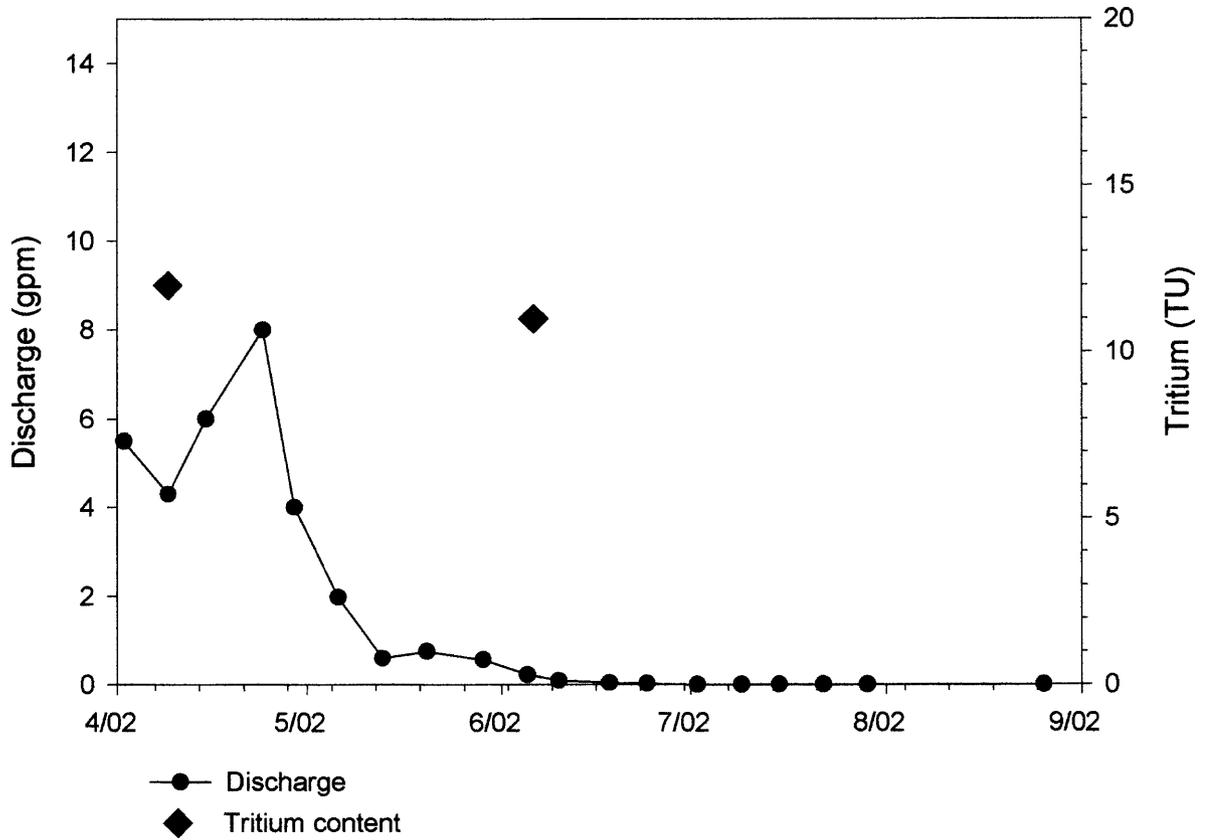


Figure 5s Plots of discharge and tritium content at DC-4, and precipitation at the Dugout Mine rain gauge.

DC-5

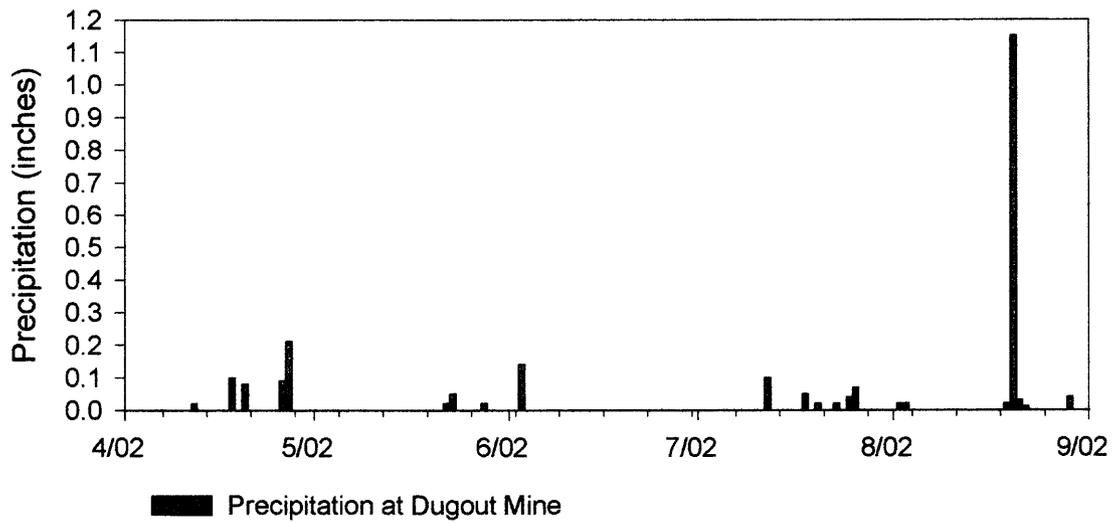
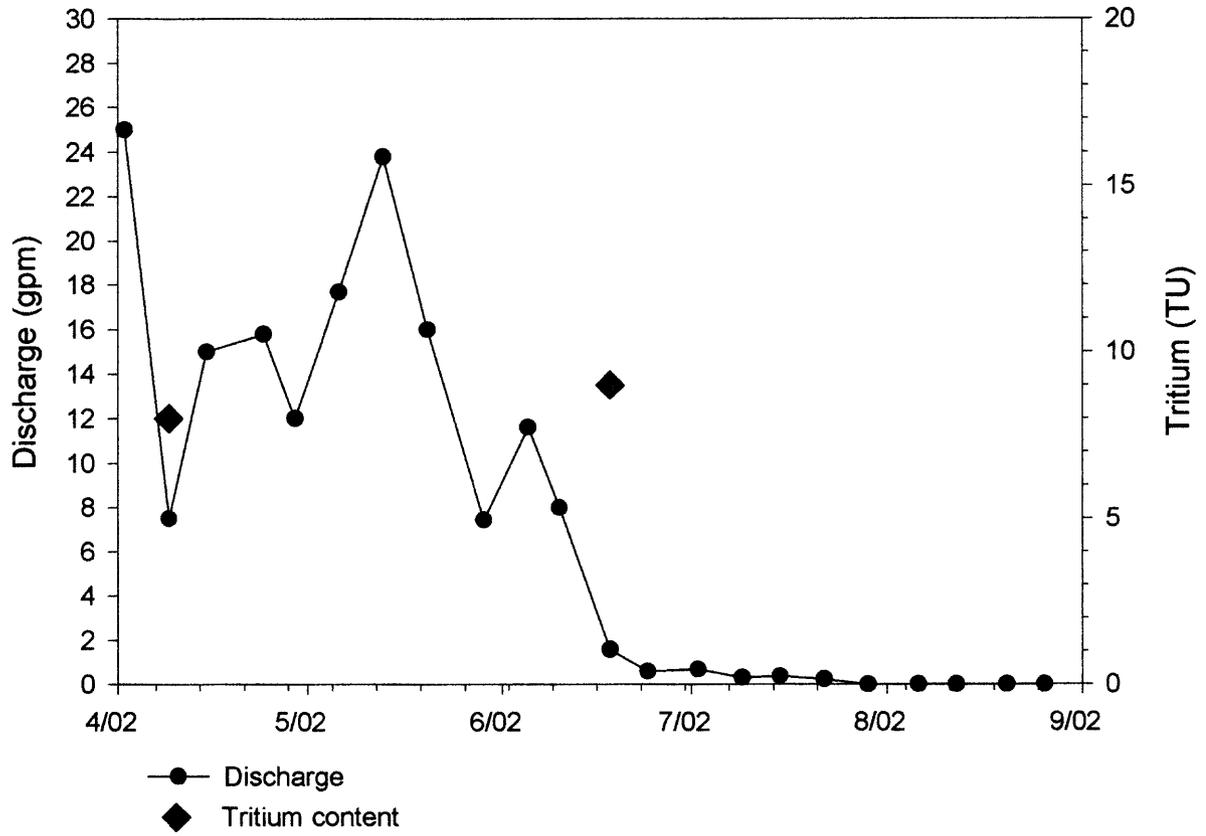


Figure 5t Plots of discharge and tritium content at DC-5, and precipitation at the Dugout Mine rain gauge.

PC-1A

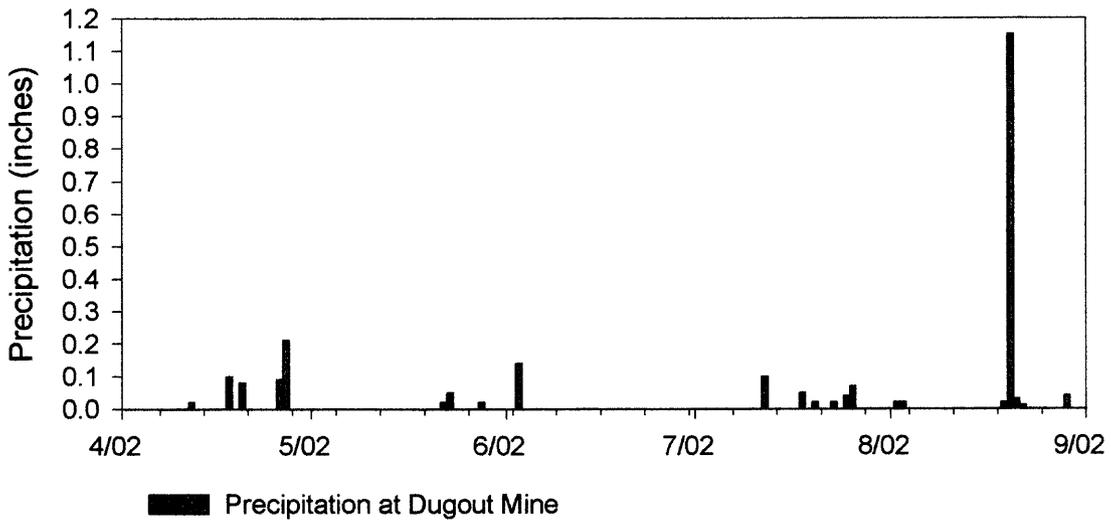
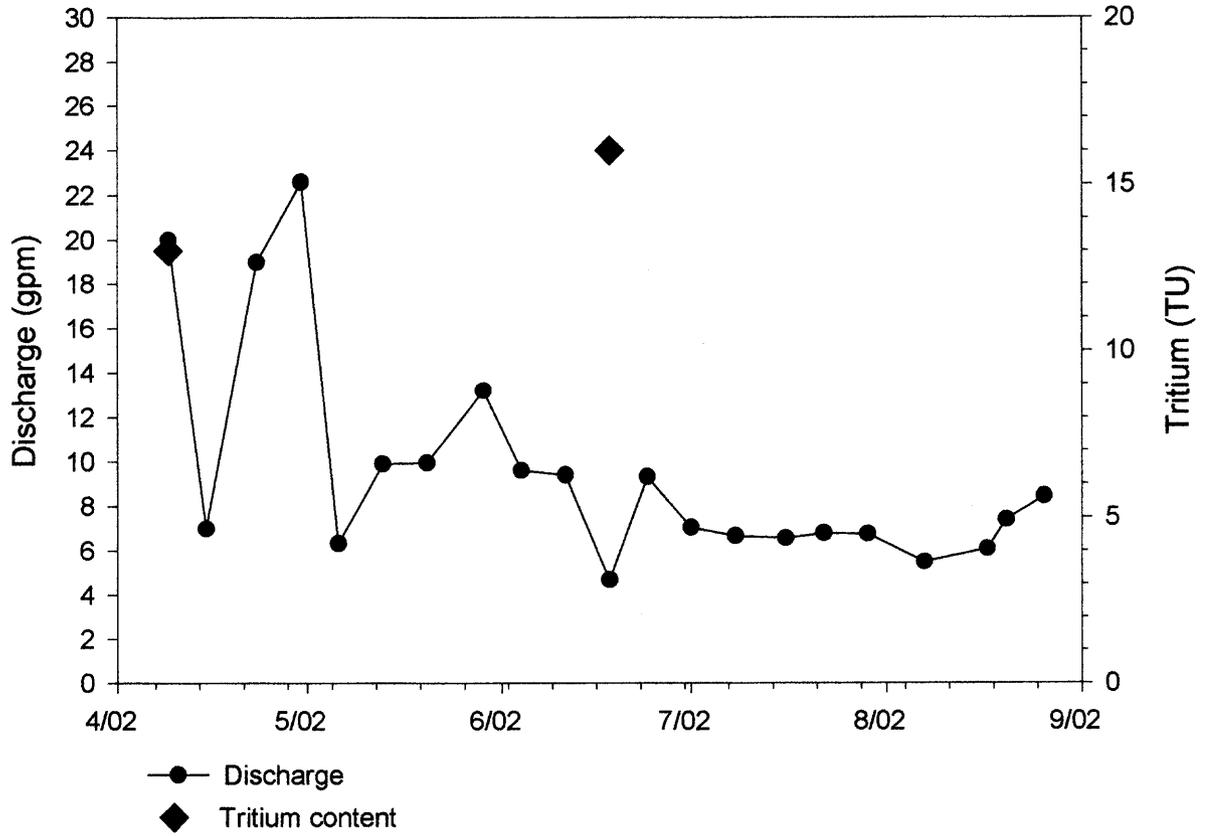


Figure 5u Plots of discharge and tritium content at PC-1A, and precipitation at the Dugout Mine rain gauge.

PC-2

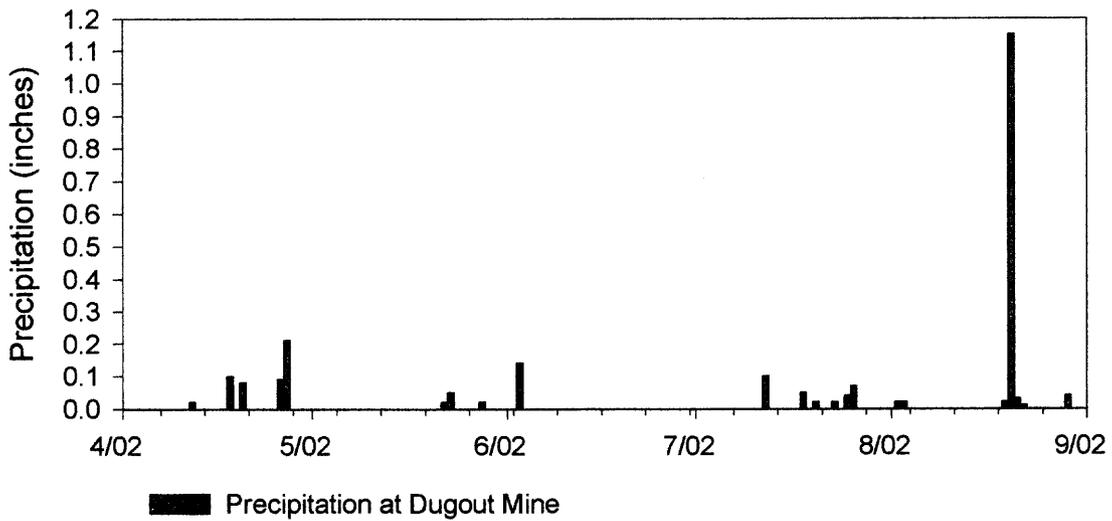
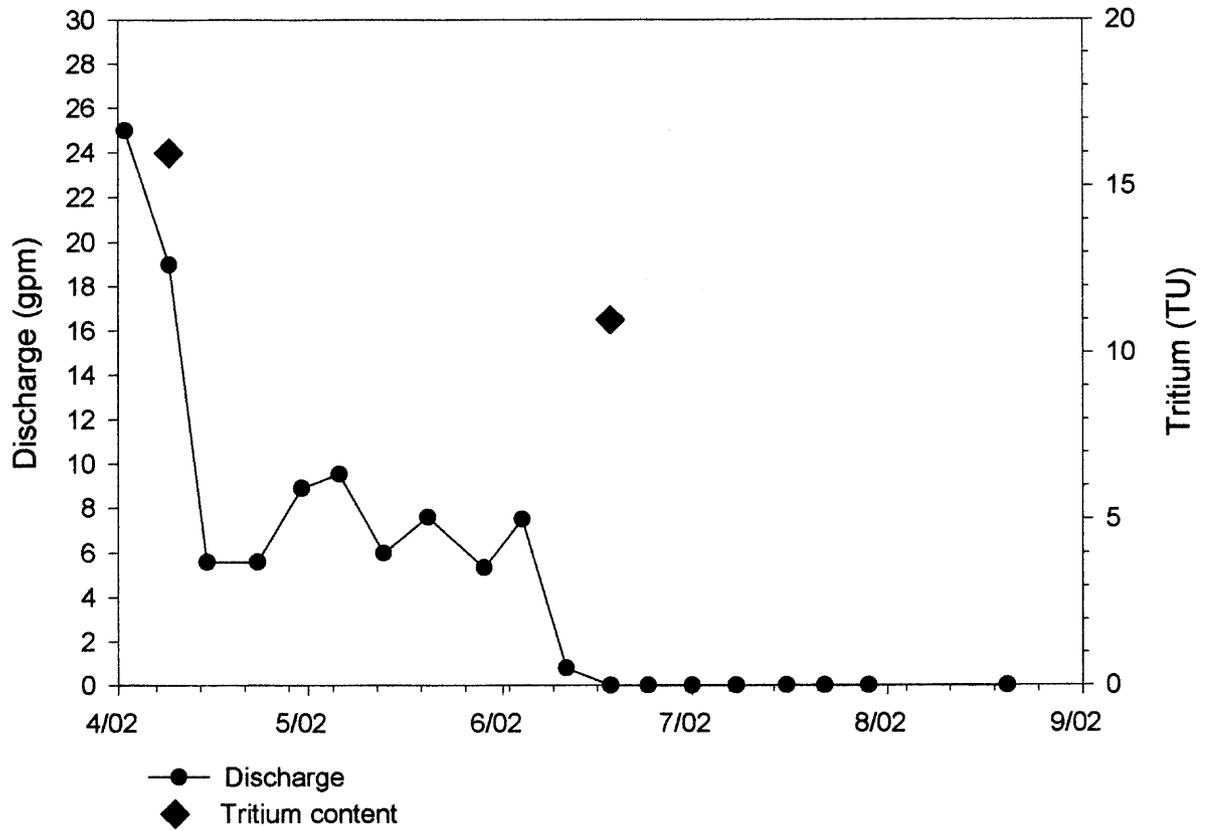


Figure 5v Plots of discharge and tritium content at PC-2, and precipitation at the Dugout Mine rain gauge.

RC-1

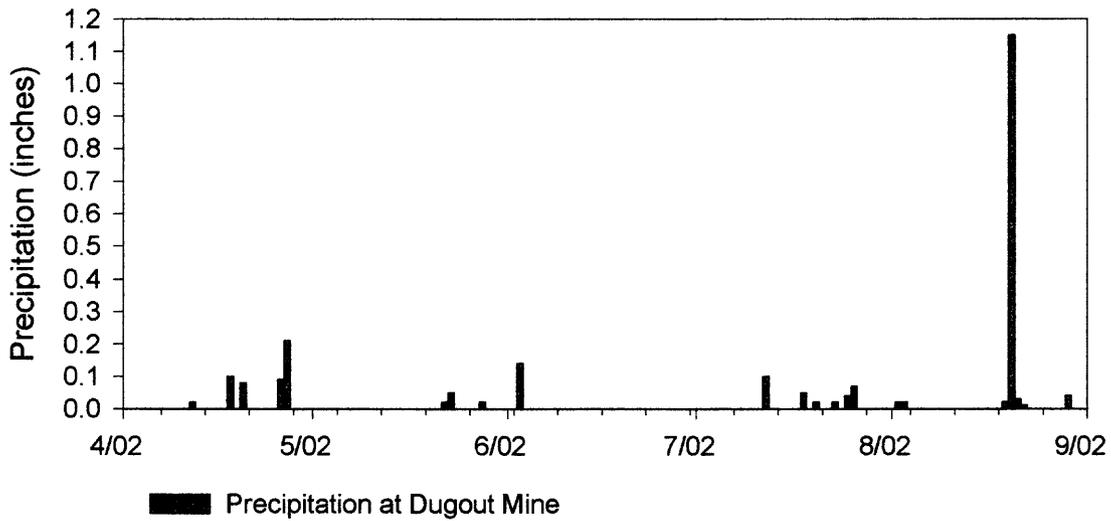
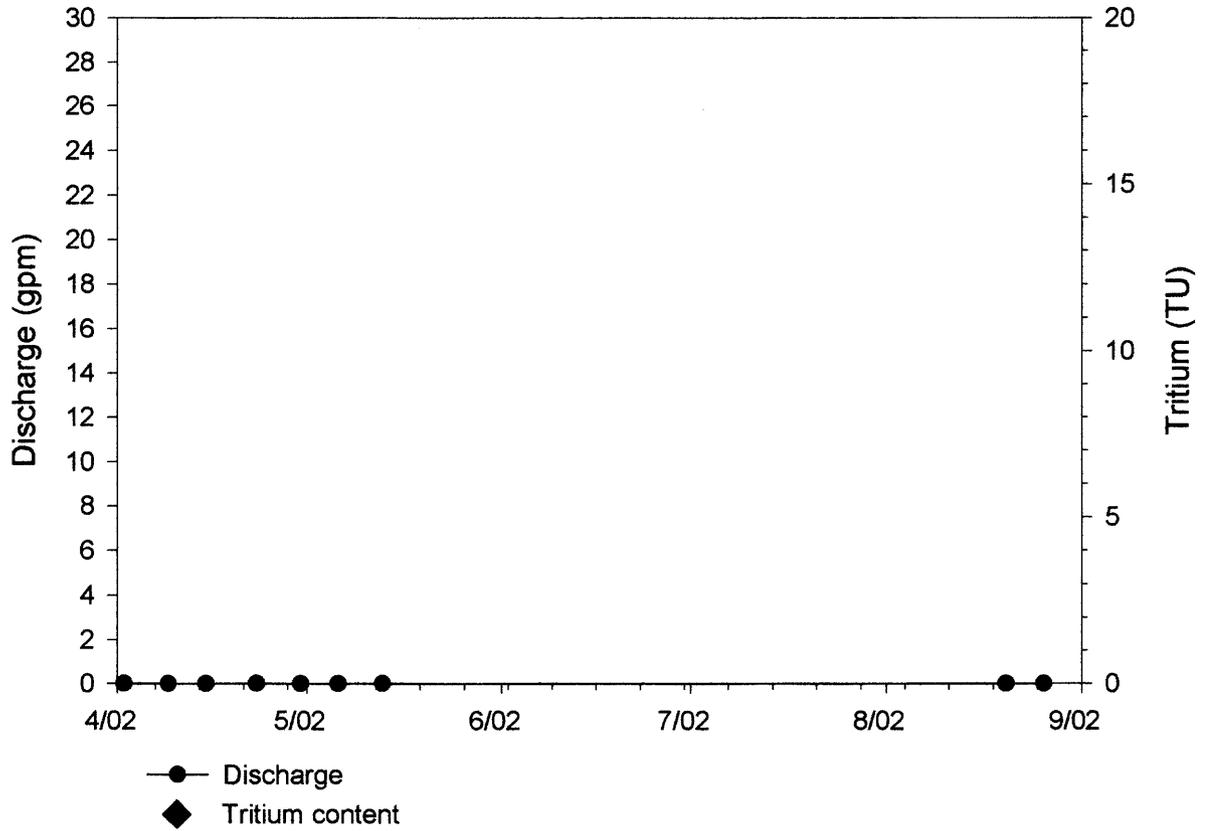


Figure 5w Plots of discharge and tritium content at RC-1, and precipitation at the Dugout Mine rain gauge.

Soldier Creek

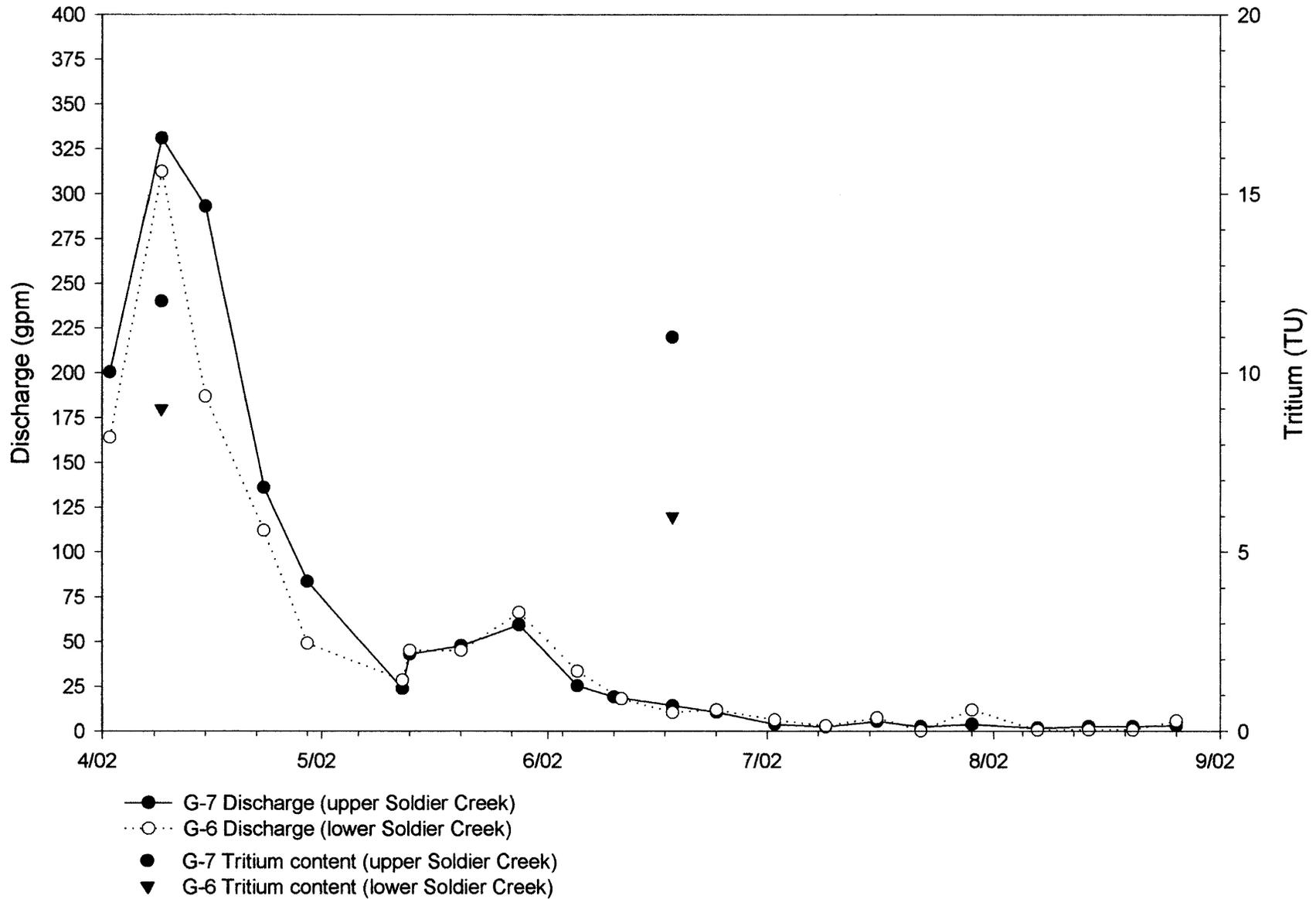


Figure 6a Plots of discharge and tritium content at G-7 (upper Soldier Creek), and G-6 (lower Soldier Creek).

Dugout Creek

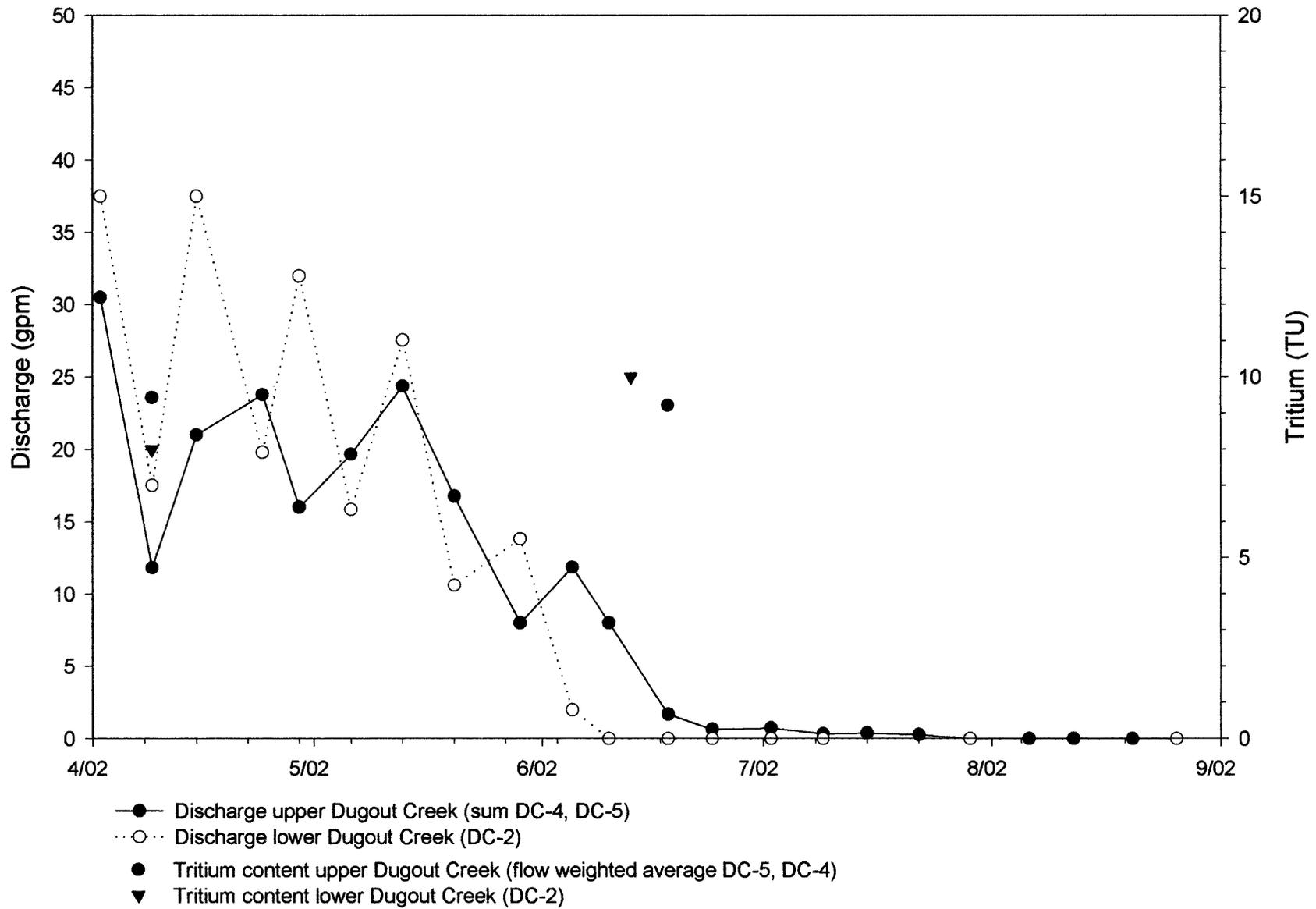


Figure 6b Plots of discharge and tritium content upper Dugout Creek (sum DC-4, DC-5), and G-6 (lower Dugout Creek (DC-2)).

Pace Canyon Creek

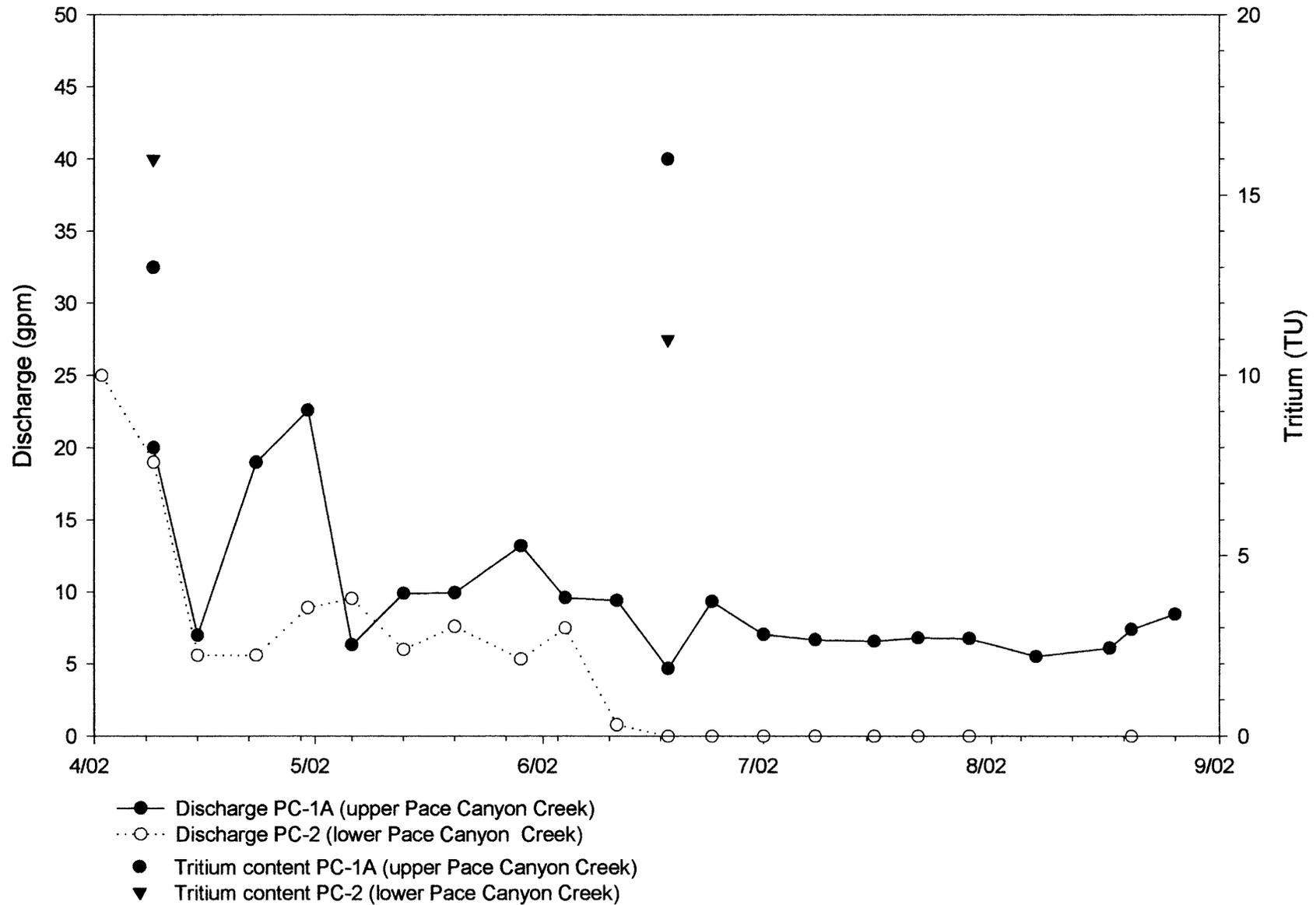


Figure 6c Plots of discharge and tritium content at PC-1A (upper Pace Canyon Creek) and PC-2 (lower Pace Canyon Creek).

Rock Canyon Creek

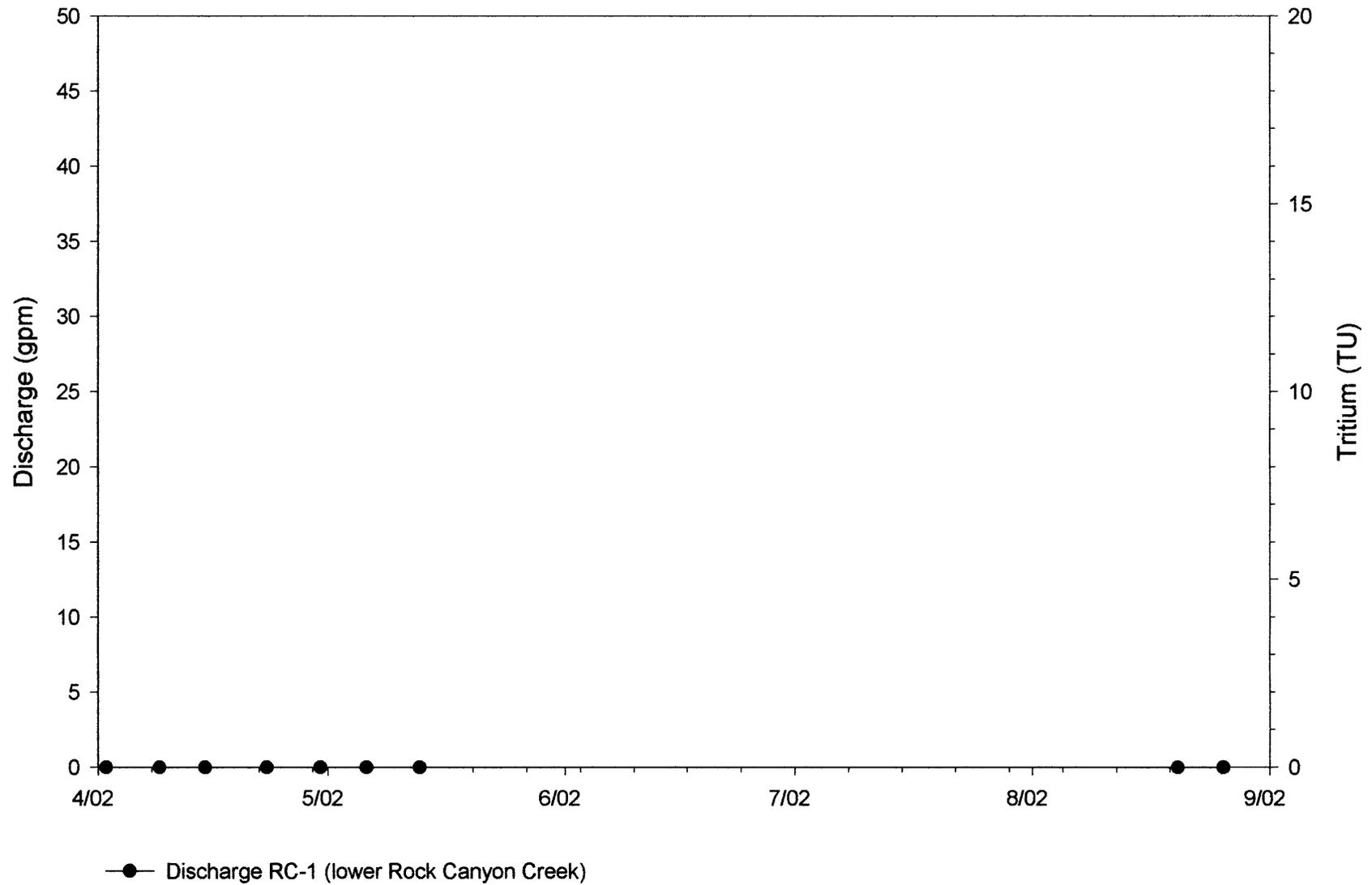


Figure 6d Plots of discharge and tritium content in Rock Canyon Creek.

Table 1 Soldier Creek/Dugout Mines sample locations and details

PETERSEN HYDROLOGIC, Table 1 Dugout-SC3.xls 16 Mar 03

| Site | Geology | Comments |
|----------------|---|---|
| Springs | | |
| Site SC-65 | Colton Formation | |
| Site 260 | Colton Formation | |
| Site SP-20 | Flagstaff Limestone | Also known as S-30 |
| Site SC-100 | Flagstaff Limestone | |
| Site SC-116 | North Horn Formation | |
| Site SC-14 | North Horn Formation | |
| Site 5 | North Horn Formation | Also known as S-5, CC-53 |
| Site 10 | North Horn Formation | Also known as Sulfur Spring 10, S-10, G89 |
| Site 23 | North Horn Formation | Also known as CC-36 |
| Site 24 | North Horn Formation | Also known as CC-40 |
| Site 200 | North Horn Formation | |
| Site 203 | North Horn Formation | |
| Site 259 | North Horn Formation | |
| Site 227 | Castlegate Sandstone | |
| Streams | | |
| Site DC-2 | Blackhawk Formation | Dugout Creek (lower main fork) |
| Site DC-3 | Blackhawk Formation | Dugout Creek (lower right fork) |
| Site DC-4 | Blackhawk Formation/Castlegate SS contact | Dugout Creek (upper left fork) |
| Site DC-5 | Blackhawk Formation/Castlegate SS contact | Dugout Creek (upper left fork) |
| Site PC-1A | North Horn Formation | Pace Creek (above permit area) |
| Site PC-2 | Blackhawk Formation | Pace Creek (below permit area) |
| Site RC-1 | Blackhawk Formation / Qa | Rock Creek (below permit area) |
| Site G-6 | Blackhawk Formation | Soldier Creek lower |
| Site G-7 | North Horn Formation | Soldier Creek upper |

Table 2 Precipitation measured at the Dugout Canyon Mine.

PETERSEN HYDROLOGIC, Table2.xls 20 Mar 03

| <u>Date</u> | <u>Precipitation (inches)</u> |
|-------------|-----------------------------------|
| 4/12/2002 | 0.02 |
| 4/18/2002 | 0.1 |
| 4/20/2002 | 0.08 |
| 4/26/2002 | 0.09 |
| 4/27/2002 | 0.21 |
| 5/22/2002 | 0.02 |
| 5/23/2002 | 0.05 |
| 5/28/2002 | 0.02 |
| 6/3/2002 | 0.14 |
| 7/12/2002 | 0.1 |
| 7/18/2002 | 0.05 |
| 7/20/2002 | 0.02 |
| 7/23/2002 | 0.02 |
| 7/25/2002 | 0.04 |
| 7/26/2002 | 0.07 |
| 8/2/2002 | 0.02 |
| 8/3/2002 | 0.02 |
| 8/19/2002 | 0.02 |
| 8/20/2002 | 1.15 |
| 8/21/2002 | 0.03 |
| 8/22/2002 | 0.01 |
| 8/29/2002 | 0.04 |

Note: precipitation data shown only for those days with precipitation.

Table 4 Tritium and solute compositions of Soldier Canyon Mine groundwaters.

| | Date | Tritium (TU) | T (°C) | pH | Cond. μS/cm | Ca ²⁺ (mg/L) | Mg ²⁺ (mg/L) | Na ⁺ (mg/L) | K ⁺ (mg/L) | Fe (d) (mg/L) | Fe (t) (mg/L) | HCO ₃ ⁻ (mg/L) | CO ₃ ²⁻ (mg/L) | SO ₄ ²⁻ (mg/L) | Cl ⁻ (mg/L) |
|----------------------|-----------|-----------------|-------------|-------------|----------------|----------------------------|----------------------------|---------------------------|--------------------------|------------------|------------------|---|---|---|---------------------------|
| Drill Hole SC-38 | 23-Feb-95 | 0.14 | 15 | 7.88 | 1250 | 67.74 | 31 | 287.1 | 20.3 | 0.113 | 0.118 | 1116 | 0 | 0.48 | 46.08 |
| Main East X-Cut 7 | 23-Feb-95 | 0 | 14.7 | 8.07 | 1500 | 50.24 | 33.7 | 366.2 | 16.5 | 0.009 | 0.051 | 1308 | 0 | 1.44 | 39.11 |
| 12th West | 23-Feb-95 | 0.15 | 16.5 | 8.05 | 1150 | 66.77 | 32.1 | 256.2 | 24.4 | 0 | 0.039 | 1062 | 0 | 1.25 | 38.37 |
| Drill Hole SC-12G | 23-Feb-95 | 0.06 | 17.2 | 7.75 | 1480 | 17.18 | 14.61 | 449.4 | 16.44 | 0.044 | 1.479 | 1304 | 0 | 6.1 | 41.1 |
| 8th West | 23-Feb-95 | 0.15 | 18.2 | 7.5 | 2050 | 32.26 | 18.7 | 580.5 | 30.5 | 0.008 | 0.079 | 1704 | 0 | 2.76 | 96.07 |
| 11th East (UG-11E) | 23-Feb-95 | 0.08 | 22.8 | 7.85 | 1710 | 16.3 | 11.97 | 449.5 | 17 | 0.009 | 0.165 | 1249 | 0 | 67.01 | 51.56 |
| Degas Hole, Sun Seam | 23-Feb-95 | 0.11 | 17 | 7.7 | 700 | 50.97 | 35.8 | 115 | 13.86 | 0.023 | 0.287 | 680 | 0 | 3.76 | 9.491 |
| 3rd West pillar area | 23-Feb-95 | 0.06 | 17.5 | 7.25 | 1060 | 75.28 | 46 | 165.1 | 10.6 | 0.008 | 0.294 | 770 | 0 | 114.8 | 25.33 |
| Average | | 0.09 | 17.4 | 7.76 | 1360 | 47.1 | 28.0 | 334 | 19 | 0.03 | 0.31 | 1149 | 0 | 24.7 | 43.4 |

Appendix A

Laboratory Reporting Sheets

Tritium Analyses

University of Miami Tritium Laboratory

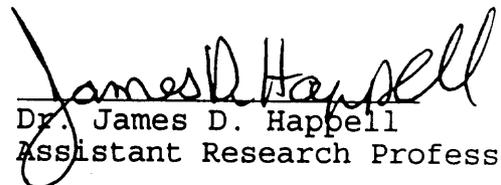


August 9, 2002

TRITIUM LABORATORY

Data Release #02-073
Job # 1635

PETERSEN HYDROLOGIC
TRITIUM SAMPLES


Dr. James D. Happell
Assistant Research Professor

Distribution:
Erik C. Petersen
Petersen Hydrologic
2695 N. 600 E.
Lehi, UT 84043

Rosenstiel School of Marine and Atmospheric Science
Tritium Laboratory
4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: (305) 361-4100
Fax: (305) 361-4112
email: tritium@rsmas.miami.edu

GENERAL COMMENTS ON TRITIUM RESULTSTritium Scale New Half-life

Tritium concentrations are expressed in TU, where 1 TU indicates a T/H abundance ratio of 10^{-18} . The values refer to the tritium scale recommended by U.S. National Institute of Science and Technology (NIST, formerly NBS), and International Atomic Energy Agency (IAEA). The TU-numbers are based on the NIST tritium water standard #4926E. Age corrections and conversions are made using the recommended half-life of **12.32 years**, i.e., a decay rate of $\lambda = 5.626\% \text{ year}^{-1}$. In this scale, 1 TU is equivalent to 7.151 dpm/kg H₂O, or 3.222 pCi/kg H₂O, or 0.1192 Bq/kg H₂O (Bq = disint/sec).

TU values are calculated for date of sample collection, REFDATE in the table, as provided by the submitter. If no such date is available, date of sample arrival at our laboratory is used.

The stated errors, eTU, are one standard deviation (1 sigma) including all conceivable contributions. In the table, QUANT is quantity of sample received, and ELYS is the amount of water taken for electrolytic enrichment. DIR means direct run (no enrichment).

Remark: From 1 Jan 1994 through 31 Dec 2001 we used the previously recommended value for the half-life, 12.43 years. The use of the new number, 12.32 years will in practice increase the reported TU-values by 0.9 %. This is insignificant since our reported values carry 1 sigma uncertainties of 3 % or more.

It is interesting to note that before 1994 we used the older, then recommended value of 12.26 years.

Very low tritium values

In some cases, negative TU values are listed. Such numbers can occur because the net tritium count rate is, in principle the difference between the count rate of the sample and that of a tritium-free sample (background count or blank sample). Given a set of "unknown" samples with no tritium, the distribution of net results should become symmetrical around 0 TU. The negative values are reported as such for the benefit of allowing the user unbiased statistical treatment of sets of the data. For other applications, 0 TU should be used.

Additional information

Refer to Services Rendered (Tritium), Section II.8, in the "Tritium Laboratory Price Schedule; Procedures and Standards; Advice on Sampling", and our Web-site www.rsmas.edu/groups/tritium.

Tritium efficiencies and background values are somewhat different in each of the nine counters and values are corrected for cosmic intensity, gas pressure and other parameters. For tritium, the efficiency is typically 1.00 cpm per 100 TU (direct counting). At 50x enrichment, the efficiency is equivalent to 1.00 cpm per 2.4 TU. The background is typically 0.3 cpm, known to about ± 0.02 cpm. Our reported results include not only the Poisson statistics, but also other experimental uncertainties such as enrichment error, etc.

End

Client: PETERSON HYDROLOGIC-DUGOUT MINE

Pur. Order: Inv. to V. Miller

Recvd : 02/07/22

Contact: E. Petersen, 801/766-4006

Job# : 1635

2695 N. 600 E.

Final : 02/08/08 Dugout/Soldier Cyn Mine Investigation 2002

Nehi, UT 84043

| Cust | LABEL | INFO | JOB.SX | REFDATE | QUANT | ELYS | TU | eTU | |
|--------------|--------|--------|---------|---------|-------|------|----|-----|---|
| PETERSEN-CFC | 200 | DIRECT | 1635.01 | 020506 | 30 | DIR | 10 | 2 | |
| PETERSEN-CFC | DC-3 | DIRECT | 1635.02 | 020409 | 30 | DIR | 10 | 2 | |
| PETERSEN-CFC | PC2 | DIRECT | 1635.03 | 020409 | 30 | DIR | 16 | 3 | |
| PETERSEN-CFC | SC-100 | DIRECT | 1635.04 | 020409 | 30 | DIR | 10 | 3 | |
| PETERSEN-CFC | SC-116 | DIRECT | 1635.05 | 020411 | 30 | DIR | 13 | 2 | |
| PETERSEN-CFC | SP-20 | DIRECT | 1635.06 | 020412 | 30 | DIR | 10 | 2 | |
| PETERSEN-CFC | 203 | DIRECT | 1635.07 | 020409 | 30 | DIR | 13 | * | 3 |
| PETERSEN-CFC | 10 | DIRECT | 1635.08 | 020409 | 30 | DIR | 0 | * | 2 |
| PETERSEN-CFC | DC-2 | DIRECT | 1635.09 | 020409 | 30 | DIR | 8 | * | 3 |
| PETERSEN-CFC | G7 | DIRECT | 1635.10 | 020409 | 30 | DIR | 12 | | 3 |
| PETERSEN-CFC | SC-65 | DIRECT | 1635.11 | 020409 | 30 | DIR | 11 | | 2 |
| PETERSEN-CFC | DC-5 | DIRECT | 1635.12 | 020409 | 30 | DIR | 8 | | 2 |
| PETERSEN-CFC | DC-4 | DIRECT | 1635.13 | 020409 | 30 | DIR | 12 | | 2 |
| PETERSEN-CFC | PC1A | DIRECT | 1635.14 | 020409 | 30 | DIR | 13 | | 3 |
| PETERSEN-CFC | 5 | DIRECT | 1635.15 | 020415 | 30 | DIR | 11 | * | 3 |
| PETERSEN-CFC | 260 | DIRECT | 1635.16 | 020417 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | SC-14 | DIRECT | 1635.17 | 020412 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | G6 | DIRECT | 1635.18 | 020409 | 30 | DIR | 9 | | 2 |
| PETERSEN-CFC | SP-20 | DIRECT | 1635.19 | 020618 | 30 | DIR | 12 | | 2 |
| PETERSEN-CFC | SC-14 | DIRECT | 1635.20 | 020618 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | SC-65 | DIRECT | 1635.21 | 020618 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | 260 | DIRECT | 1635.22 | 020618 | 30 | DIR | 13 | | 2 |
| PETERSEN-CFC | DC-3 | DIRECT | 1635.23 | 020606 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | PC-2 | DIRECT | 1635.24 | 020618 | 30 | DIR | 11 | | 2 |
| PETERSEN-CFC | DC-2 | DIRECT | 1635.25 | 020613 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | 10 | DIRECT | 1635.26 | 020618 | 30 | DIR | 2 | * | 3 |
| PETERSEN-CFC | G-7 | DIRECT | 1635.27 | 020618 | 30 | DIR | 11 | | 3 |
| PETERSEN-CFC | DC-5 | DIRECT | 1635.28 | 020618 | 30 | DIR | 9 | | 2 |
| PETERSEN-CFC | G-6 | DIRECT | 1635.29 | 020618 | 30 | DIR | 6 | | 2 |
| PETERSEN-CFC | DC-4 | DIRECT | 1635.30 | 020606 | 30 | DIR | 11 | | 2 |
| PETERSEN-CFC | PC-1A | DIRECT | 1635.31 | 020618 | 30 | DIR | 16 | | 2 |
| PETERSEN-CFC | 203 | DIRECT | 1635.32 | 020618 | 30 | DIR | 10 | | 2 |
| PETERSEN-CFC | 5 | DIRECT | 1635.33 | 020613 | 30 | DIR | 11 | | 2 |
| PETERSEN-CFC | SC-116 | DIRECT | 1635.34 | 020618 | 30 | DIR | 12 | | 2 |

* Average of duplicate runs

Appendix B

Laboratory Reporting Sheets

Solute Analyses

ACZ, Inc. and CT&E Co.

Report Header Explanations

| | |
|----------------|---|
| <i>Batch</i> | A distinct set of samples analyzed at a specific time |
| <i>Found</i> | Value of the QC Type of interest |
| <i>Limit</i> | Upper limit for RPD, in %. |
| <i>Lower</i> | Lower Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>MDL</i> | Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations. |
| <i>PCN/SCN</i> | A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis |
| <i>PQL</i> | Practical Quantitation Limit, typically 5 times the MDL. |
| <i>QC</i> | True Value of the Control Sample or the amount added to the Spike |
| <i>Rec</i> | Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg) |
| <i>RPD</i> | Relative Percent Difference, calculation used for Duplicate QC Types |
| <i>Upper</i> | Upper Recovery Limit, in % (except for LCSS, mg/Kg) |
| <i>Sample</i> | Value of the Sample of interest |

QC Sample Types

| | | | |
|-------------|---|---------------|---------------------------------------|
| <i>AS</i> | Analytical Spike (Post Digestion) | <i>LFM</i> | Laboratory Fortified Matrix |
| <i>ASD</i> | Analytical Spike (Post Digestion) Duplicate | <i>LFMD</i> | Laboratory Fortified Matrix Duplicate |
| <i>DUP</i> | Sample Duplicate | <i>LRB</i> | Laboratory Reagent Blank |
| <i>LCSS</i> | Laboratory Control Sample - Soil | <i>MS/MSD</i> | Matrix Spike/Matrix Spike Duplicate |
| <i>LCSW</i> | Laboratory Control Sample - Water | <i>PBS</i> | Prep Blank - Soil |
| <i>LFB</i> | Laboratory Fortified Blank | <i>PBW</i> | Prep Blank - Water |

QC Sample Type Explanations

| | |
|-------------------------|--|
| Blanks | Verifies that there is no or minimal contamination in the prep method procedure. |
| Control Samples | Verifies the accuracy of the method, including the prep procedure. |
| Duplicates | Verifies the precision of the instrument and/or method. |
| Spikes/Fortified Matrix | Determines sample matrix interferences, if any. |

ACZ Qualifiers (Qual)

| | |
|---|--|
| B | Analyte concentration detected at a value between MDL and PQL. |
| H | Analysis exceeded method hold time. pH is a field test with an immediate hold time. |
| R | Poor spike recovery accepted because the other spike in the set fell within the given limits. |
| T | High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL. |
| U | Analyte was analyzed for but not detected at the indicated MDL |
| V | High blank data accepted because sample concentration is 10 times higher than blank concentration |
| W | Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride. |
| X | Quality control sample is out of control. |
| Z | Poor spike recovery is accepted because sample concentration is four times greater than spike concentration. |

Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.



Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: SC100

ACZ ID: L36454-12

Date Sampled: 04/09/02 13:15
Date Received: 04/12/02
Sample Matrix: Ground 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 | 04/21/02 4:51 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/21/02 4:51 | bf |
| Iron, total | M200.7 ICP | 0.08 | | mg/L | 0.01 | 0.05 | 04/30/02 11:47 | ct |
| Magnesium, dissolved | M200.7 ICP | 43.7 | | mg/L | 0.2 | 1 | 04/21/02 4:51 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/21/02 4:51 | bf |
| Manganese, total | M200.7 ICP | 0.005 | B | mg/L | 0.005 | 0.03 | 04/25/02 2:04 | bf |
| Potassium, dissolved | M200.7 ICP | 1.2 | | mg/L | 0.3 | 1 | 04/21/02 4:51 | bf |
| Sodium, dissolved | M200.7 ICP | 22.4 | | mg/L | 0.3 | 1 | 04/21/02 4:51 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/29/02 19:55 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 256 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 256 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 10.0 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 6.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 7.7 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 5 | | mg/L | 1 | 5 | 04/23/02 14:39 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 380 | | mg/L | 10 | 20 | 04/16/02 17:47 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.53 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 50 | | mg/L | 10 | 20 | 04/23/02 11:52 | lc |
| TDS (calculated) | Calculation | 339 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.12 | | | | | 04/24/02 0:00 | calc |

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

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company

Project ID: DUGOUT MINE
Sample ID: SC116

ACZ ID: L36493-04

Date Sampled: 04/11/02 10:55
Date Received: 04/16/02
Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 74.6 | | mg/L | 0.2 | 1 | 04/25/02 16:43 | ct |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/25/02 16:43 | ct |
| Iron, total | M200.7 ICP | 2.56 | | mg/L | 0.01 | 0.05 | 04/27/02 21:14 | bf |
| Magnesium, dissolved | M200.7 ICP | 50.9 | | mg/L | 0.2 | 1 | 04/25/02 16:43 | ct |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/25/02 16:43 | ct |
| Manganese, total | M200.7 ICP | 0.065 | | mg/L | 0.005 | 0.03 | 04/27/02 21:14 | bf |
| Potassium, dissolved | M200.7 ICP | 1.3 | | mg/L | 0.3 | 1 | 04/25/02 16:43 | ct |
| Sodium, dissolved | M200.7 ICP | 11.7 | | mg/L | 0.3 | 1 | 04/25/02 16:43 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 18:13 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 249 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Total Alkalinity | | 249 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Cation-Anion Balance Calculation | | | | | | | | |
| Cation-Anion Balance | | 8.4 | | % | | | 04/26/02 0:00 | calc |
| Sum of Anions | | 7.1 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Sum of Cations | | 8.4 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 4 | B | mg/L | 1 | 5 | 04/23/02 15:55 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 440 | | mg/L | 10 | 20 | 04/08/02 12:50 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.25 | | | 0.03 | 0.15 | 04/26/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 100 | | mg/L | 10 | 20 | 04/23/02 11:41 | lc |
| TDS (calculated) | Calculation | 392 | | mg/L | 10 | 50 | 04/26/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.12 | | | | | 04/26/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: 2ND QTR
 Sample ID: 203

ACZ ID: L36454-15

Date Sampled: 04/09/02 14:25
 Date Received: 04/12/02
 Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|---------------|---------|
| Calcium, dissolved | M200.7 ICP | 86.0 | | mg/L | 0.2 | 1 | 04/21/02 4:59 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/21/02 4:59 | bf |
| Iron, total | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/24/02 5:21 | bf |
| Magnesium, dissolved | M200.7 ICP | 64.4 | | mg/L | 0.2 | 1 | 04/21/02 4:59 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/21/02 4:59 | bf |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/24/02 5:21 | bf |
| Potassium, dissolved | M200.7 ICP | 2.5 | | mg/L | 0.3 | 1 | 04/21/02 4:59 | bf |
| Sodium, dissolved | M200.7 ICP | 52.8 | | mg/L | 0.3 | 1 | 04/21/02 4:59 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 9:17 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 294 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 294 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 7.6 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 10.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 12.0 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 7 | | mg/L | 1 | 5 | 04/23/02 14:42 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 970 | | mg/L | 10 | 20 | 04/16/02 17:54 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 1.06 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 200 | | mg/L | 10 | 20 | 04/23/02 11:57 | lc |
| TDS (calculated) | Calculation | 589 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.65 | | | | | 04/24/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: DUGOUT MINE
 Sample ID: 260

ACZ ID: L36493-05

Date Sampled: 04/11/02 12:25
 Date Received: 04/16/02
 Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 60.9 | | mg/L | 0.2 | 1 | 04/25/02 16:46 | ct |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/25/02 16:46 | ct |
| Iron, total | M200.7 ICP | 0.10 | | mg/L | 0.01 | 0.05 | 04/30/02 21:43 | ct |
| Magnesium, dissolved | M200.7 ICP | 25.3 | | mg/L | 0.2 | 1 | 04/25/02 16:46 | ct |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/25/02 16:46 | ct |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/27/02 21:26 | bf |
| Potassium, dissolved | M200.7 ICP | 1.2 | | mg/L | 0.3 | 1 | 04/25/02 16:46 | ct |
| Sodium, dissolved | M200.7 ICP | 12.7 | | mg/L | 0.3 | 1 | 04/25/02 16:46 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 18:30 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 211 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Total Alkalinity | | 211 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 9.6 | | % | | | 04/26/02 0:00 | calc |
| Sum of Anions | | 4.7 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Sum of Cations | | 5.7 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 3 | B | mg/L | 1 | 5 | 04/23/02 15:56 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 290 | | mg/L | 10 | 20 | 04/08/02 12:51 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.34 | | | 0.03 | 0.15 | 04/26/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 20 | | mg/L | 10 | 20 | 04/23/02 11:44 | lc |
| TDS (calculated) | Calculation | 250 | | mg/L | 10 | 50 | 04/26/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.16 | | | | | 04/26/02 0:00 | calc |

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

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: DC2

ACZ ID: L36454-07

Date Sampled: 04/09/02 12:55
Date Received: 04/12/02
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 67.9 | | mg/L | 0.2 | 1 | 04/23/02 19:30 | ct |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/23/02 19:30 | ct |
| Iron, total | M200.7 ICP | 0.01 | B | mg/L | 0.01 | 0.05 | 04/24/02 5:01 | bf |
| Magnesium, dissolved | M200.7 ICP | 59.9 | | mg/L | 0.2 | 1 | 04/23/02 19:30 | ct |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/23/02 19:30 | ct |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/24/02 5:01 | bf |
| Potassium, dissolved | M200.7 ICP | 2.4 | | mg/L | 0.3 | 1 | 04/23/02 19:30 | ct |
| Sodium, dissolved | M200.7 ICP | 28.7 | | mg/L | 0.3 | 1 | 04/23/02 19:30 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 5:41 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO ₃ | SM2320B | | | | | | | |
| Bicarbonate as CaCO ₃ | | 260 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO ₃ | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO ₃ | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 260 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 7.3 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 8.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 9.6 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 9 | | mg/L | 1 | 5 | 04/23/02 14:34 | ksj |
| Oil & Grease, Total Recoverable | M1684 - Gravimetric | | U | mg/L | 2 | 10 | 04/24/02 3:19 | ecr |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 520 | | mg/L | 10 | 20 | 04/16/02 17:34 | teb |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | | U | mg/L | 5 | 20 | 04/15/02 13:12 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.62 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 140 | | mg/L | 10 | 20 | 04/23/02 11:10 | lc |
| TDS (calculated) | Calculation | 464 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.12 | | | | | 04/24/02 0:00 | calc |

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

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-6493

Inorganic Analytical Results

Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: DC3

ACZ ID: L36454-11

Date Sampled: 04/09/02 13:10
Date Received: 04/12/02
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 59.2 | | mg/L | 0.2 | 1 | 04/23/02 21:13 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/23/02 21:13 | bf |
| Iron, total | M200.7 ICP | 0.05 | B | mg/L | 0.01 | 0.05 | 04/24/02 5:17 | bf |
| Magnesium, dissolved | M200.7 ICP | 43.9 | | mg/L | 0.2 | 1 | 04/23/02 21:13 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/23/02 21:13 | bf |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/24/02 5:17 | bf |
| Potassium, dissolved | M200.7 ICP | 1.8 | | mg/L | 0.3 | 1 | 04/23/02 21:13 | bf |
| Sodium, dissolved | M200.7 ICP | 16.5 | | mg/L | 0.3 | 1 | 04/23/02 21:13 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 8:34 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO ₃ | SM2320B | | | | | | | |
| Bicarbonate as CaCO ₃ | | 200 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO ₃ | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO ₃ | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 200 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance Calculation | | | | | | | | |
| Cation-Anion Balance | | 6.6 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 6.4 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 7.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 6 | | mg/L | 1 | 5 | 04/23/02 14:38 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/25/02 10:40 | haw |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 390 | | mg/L | 10 | 20 | 04/16/02 17:44 | teb |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | | U | mg/L | 5 | 20 | 04/15/02 13:22 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.40 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 110 | | mg/L | 10 | 20 | 04/23/02 11:20 | lc |
| TDS (calculated) | Calculation | 357 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.09 | | | | | 04/24/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: DC4

ACZ ID: L36454-09

Date Sampled: 04/09/02 12:30
Date Received: 04/12/02
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 65.6 | | mg/L | 0.2 | 1 | 04/23/02 21:06 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/23/02 21:06 | bf |
| Iron, total | M200.7 ICP | 0.08 | | mg/L | 0.01 | 0.05 | 04/24/02 5:09 | bf |
| Magnesium, dissolved | M200.7 ICP | 49.5 | | mg/L | 0.2 | 1 | 04/23/02 21:06 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/23/02 21:06 | bf |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/24/02 5:09 | bf |
| Potassium, dissolved | M200.7 ICP | 2.1 | | mg/L | 0.3 | 1 | 04/23/02 21:06 | bf |
| Sodium, dissolved | M200.7 ICP | 19.8 | | mg/L | 0.3 | 1 | 04/23/02 21:06 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 7:07 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 271 | | mg/L | 2 | 10 | 04/19/02 0:00 | kc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | kc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | kc |
| Total Alkalinity | | 271 | | mg/L | 2 | 10 | 04/19/02 0:00 | kc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | -0.6 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 8.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 8.2 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 7 | | mg/L | 1 | 5 | 04/23/02 14:36 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/24/02 8:09 | ecr |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 440 | | mg/L | 10 | 20 | 04/16/02 17:39 | teb |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | | U | mg/L | 5 | 20 | 04/15/02 13:17 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.45 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 130 | | mg/L | 10 | 20 | 04/23/02 11:15 | kc |
| TDS (calculated) | Calculation | 437 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.01 | | | | | 04/24/02 0:00 | calc |

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: DC5

ACZ ID: L36454-10

Date Sampled: 04/09/02 12:40
Date Received: 04/12/02
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 72.4 | | mg/L | 0.2 | 1 | 04/23/02 21:09 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/23/02 21:09 | bf |
| Iron, total | M200.7 ICP | 0.03 | B | mg/L | 0.01 | 0.05 | 04/24/02 5:13 | bf |
| Magnesium, dissolved | M200.7 ICP | 64.7 | | mg/L | 0.2 | 1 | 04/23/02 21:09 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/23/02 21:09 | bf |
| Manganese, total | M200.7 ICP | 0.005 | B | mg/L | 0.005 | 0.03 | 04/24/02 5:13 | bf |
| Potassium, dissolved | M200.7 ICP | 2.5 | | mg/L | 0.3 | 1 | 04/23/02 21:09 | bf |
| Sodium, dissolved | M200.7 ICP | 31.3 | | mg/L | 0.3 | 1 | 04/23/02 21:09 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 7:51 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 273 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 273 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 8.3 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 8.8 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 10.4 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 9 | | mg/L | 1 | 5 | 04/23/02 14:37 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/25/02 9:20 | haw |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 540 | | mg/L | 10 | 20 | 04/16/02 17:41 | teb |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | | U | mg/L | 5 | 20 | 04/15/02 13:20 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.65 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 150 | | mg/L | 10 | 20 | 04/23/02 11:18 | lc |
| TDS (calculated) | Calculation | 494 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.09 | | | | | 04/24/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: PC1A

ACZ ID: L36454-06

Date Sampled: 04/09/02 14:45
Date Received: 04/12/02
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 64.8 | | mg/L | 0.2 | 1 | 04/23/02 19:27 | ct |
| Iron, dissolved | M200.7 ICP | 0.01 | B | mg/L | 0.01 | 0.05 | 04/23/02 19:27 | ct |
| Iron, total | M200.7 ICP | 6.72 | | mg/L | 0.01 | 0.05 | 04/24/02 4:38 | bf |
| Magnesium, dissolved | M200.7 ICP | 46.6 | | mg/L | 0.2 | 1 | 04/23/02 19:27 | ct |
| Manganese, dissolved | M200.7 ICP | 0.007 | B | mg/L | 0.005 | 0.03 | 04/23/02 19:27 | ct |
| Manganese, total | M200.7 ICP | 0.116 | | mg/L | 0.005 | 0.03 | 04/24/02 4:38 | bf |
| Potassium, dissolved | M200.7 ICP | 2.1 | | mg/L | 0.3 | 1 | 04/23/02 19:27 | ct |
| Sodium, dissolved | M200.7 ICP | 26.9 | | mg/L | 0.3 | 1 | 04/23/02 19:27 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 3:32 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 257 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 257 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 7.8 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 7.1 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 8.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 3 | B | mg/L | 1 | 5 | 04/23/02 14:34 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/24/02 0:53 | ecr |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 430 | | mg/L | 10 | 20 | 04/16/02 17:28 | teb |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | 80 | | mg/L | 5 | 20 | 04/15/02 13:10 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.63 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 90 | | mg/L | 10 | 20 | 04/23/02 11:07 | lc |
| TDS (calculated) | Calculation | 388 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.11 | | | | | 04/24/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: 2ND QTR
Sample ID: PC2

ACZ ID: L36454-08

Date Sampled: 04/09/02 14:40
Date Received: 04/12/02
Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 69.6 | | mg/L | 0.2 | 1 | 04/23/02 21:02 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/23/02 21:02 | bf |
| Iron, total | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/24/02 5:05 | bf |
| Magnesium, dissolved | M200.7 ICP | 70.0 | | mg/L | 0.2 | 1 | 04/23/02 21:02 | bf |
| Manganese, dissolved | M200.7 ICP | 0.006 | B | mg/L | 0.005 | 0.03 | 04/23/02 21:02 | bf |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/24/02 5:05 | bf |
| Potassium, dissolved | M200.7 ICP | 3.2 | | mg/L | 0.3 | 1 | 04/23/02 21:02 | bf |
| Sodium, dissolved | M200.7 ICP | 42.5 | | mg/L | 0.3 | 1 | 04/23/02 21:02 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 6:24 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 260 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 260 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 4.2 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 10.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 11.2 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 8 | | mg/L | 1 | 5 | 04/23/02 14:35 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/24/02 5:44 | ecr |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 640 | | mg/L | 10 | 20 | 04/16/02 17:36 | teb |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | | U | mg/L | 5 | 20 | 04/15/02 13:15 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.87 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 230 | | mg/L | 10 | 20 | 04/23/02 11:13 | lc |
| TDS (calculated) | Calculation | 579 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.11 | | | | | 04/24/02 0:00 | calc |

Soldier Creek Coal Company

Project ID: 2ND QTR
 Sample ID: 10

ACZ ID: L36454-13
 Date Sampled: 04/09/02 10:15
 Date Received: 04/12/02
 Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Calcium, dissolved | M200.7 ICP | 31.8 | | mg/L | 0.2 | 1 | 04/21/02 4:55 | bf |
| Magnesium, dissolved | M200.7 ICP | 30.5 | | mg/L | 0.2 | 1 | 04/21/02 4:55 | bf |
| Potassium, dissolved | M200.7 ICP | 3.2 | | mg/L | 0.3 | 1 | 04/21/02 4:55 | bf |
| Sodium, dissolved | M200.7 ICP | 190 | | mg/L | 2 | 10 | 04/21/02 4:55 | bf |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 405 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 405 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 10.6 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 10.1 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 12.5 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 10 | | mg/L | 1 | 5 | 04/23/02 14:41 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 650 | | mg/L | 10 | 20 | 04/16/02 17:49 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 5.85 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 80 | | mg/L | 10 | 20 | 04/23/02 11:54 | lc |
| TDS (calculated) | Calculation | 589 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.10 | | | | | 04/24/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID:
 Sample ID: 5

ACZ ID: **L36599-01**
 Date Sampled: **04/21/02 12:30**
 Date Received: **04/24/02**
 Sample Matrix: **Ground Water**

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 87.0 | | mg/L | 0.2 | 1 | 05/04/02 17:29 | bf |
| Magnesium, dissolved | M200.7 ICP | 30.2 | | mg/L | 0.2 | 1 | 05/04/02 17:29 | bf |
| Potassium, dissolved | M200.7 ICP | 0.9 | B | mg/L | 0.3 | 1 | 05/04/02 17:29 | bf |
| Sodium, dissolved | M200.7 ICP | 13.5 | | mg/L | 0.3 | 1 | 05/04/02 17:29 | bf |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 237 | | mg/L | 2 | 10 | 04/24/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/24/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/24/02 0:00 | lc |
| Total Alkalinity | | 237 | | mg/L | 2 | 10 | 04/24/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 8.8 | | % | | | 05/07/02 0:00 | calc |
| Sum of Anions | | 6.2 | | meq/L | 0.1 | 0.5 | 05/07/02 0:00 | calc |
| Sum of Cations | | 7.4 | | meq/L | 0.1 | 0.5 | 05/07/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 9 | | mg/L | 1 | 5 | 05/04/02 14:37 | sjs |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 360 | | mg/L | 10 | 20 | 04/26/02 15:22 | haw |
| Sodium Absorption Ratio In Water | USGS - 11738-78 | 0.32 | | | 0.03 | 0.15 | 05/07/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 60 | | mg/L | 10 | 20 | 04/30/02 13:16 | teb |
| TDS (calculated) | Calculation | 343 | | mg/L | 10 | 50 | 05/07/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.05 | | | | | 05/07/02 0:00 | calc |

Note: Suspected analytes were retested to verify the Cation-Anion Balance after the applicable holdtime had expired.

Soldier Creek Coal Company

Project ID: 2ND QTR
 Sample ID: G7

ACZ ID: **L36454-04**
 Date Sampled: 04/09/02 10:40
 Date Received: 04/12/02
 Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 47.1 | | mg/L | 0.2 | 1 | 04/23/02 19:04 | ct |
| Magnesium, dissolved | M200.7 ICP | 46.3 | | mg/L | 0.2 | 1 | 04/23/02 19:04 | ct |
| Potassium, dissolved | M200.7 ICP | 1.3 | | mg/L | 0.3 | 1 | 04/23/02 19:04 | ct |
| Sodium, dissolved | M200.7 ICP | 91.4 | | mg/L | 0.3 | 1 | 04/23/02 19:04 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 308 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 308 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 9.7 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 8.4 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 10.2 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 14 | | mg/L | 1 | 5 | 04/23/02 14:32 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/23/02 22:28 | ecr |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 530 | | mg/L | 10 | 20 | 04/16/02 17:23 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 2.29 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 90 | | mg/L | 10 | 20 | 04/23/02 11:05 | lc |
| TDS (calculated) | Calculation | 475 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.12 | | | | | 04/24/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: 2ND QTR
 Sample ID: G6

ACZ ID: L36454-03
 Date Sampled: 04/09/02 11:00
 Date Received: 04/12/02
 Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Calcium, dissolved | M200.7 ICP | 57.4 | | mg/L | 0.2 | 1 | 04/21/02 4:43 | bf |
| Magnesium, dissolved | M200.7 ICP | 51.5 | | mg/L | 0.2 | 1 | 04/21/02 4:43 | bf |
| Potassium, dissolved | M200.7 ICP | 2.2 | | mg/L | 0.3 | 1 | 04/21/02 4:43 | bf |
| Sodium, dissolved | M200.7 ICP | 84.5 | | mg/L | 0.3 | 1 | 04/21/02 4:43 | bf |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 290 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 290 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 11.8 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 8.6 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 10.9 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 13 | | mg/L | 1 | 5 | 04/23/02 14:32 | ksj |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 04/23/02 20:03 | ecr |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 560 | | mg/L | 10 | 20 | 04/16/02 17:20 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 1.97 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 120 | | mg/L | 10 | 20 | 04/23/02 11:47 | lc |
| TDS (calculated) | Calculation | 503 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.11 | | | | | 04/24/02 0:00 | calc |

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

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company

Project ID: DUGOUT MINE
Sample ID: ~~SE20~~
SP 20

ACZ ID: L36493-02
Date Sampled: 04/12/02 08:00
Date Received: 04/16/02
Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 77.6 | | mg/L | 0.2 | 1 | 04/25/02 16:39 | ct |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/25/02 16:39 | ct |
| Iron, total | M200.7 ICP | 2.25 | | mg/L | 0.01 | 0.05 | 04/27/02 21:10 | bf |
| Magnesium, dissolved | M200.7 ICP | 29.9 | | mg/L | 0.2 | 1 | 04/25/02 16:39 | ct |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/25/02 16:39 | ct |
| Manganese, total | M200.7 ICP | 0.368 | | mg/L | 0.005 | 0.03 | 04/27/02 21:10 | bf |
| Potassium, dissolved | M200.7 ICP | 0.9 | B | mg/L | 0.3 | 1 | 04/25/02 16:39 | ct |
| Sodium, dissolved | M200.7 ICP | 11.6 | | mg/L | 0.3 | 1 | 04/25/02 16:39 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 17:56 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|---------------------------|---------|
| Alkalinity as CaCO ₃ | SM2320B | | | | | | | |
| Bicarbonate as CaCO ₃ | | 248 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Carbonate as CaCO ₃ | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Hydroxide as CaCO ₃ | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Total Alkalinity | | 248 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Cation-Anion Balance Calculation | | | | | | | | |
| Cation-Anion Balance | | 8.8 | | % | | | 04/26/02 0:00 | calc |
| Sum of Anions | | 5.7 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Sum of Cations | | 6.8 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 4 | B | mg/L | 1 | 5 | 04/23/02 15:54 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 340 | | mg/L | 10 | 20 | 04/08/02 12:48 4/28/02 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.28 | | | 0.03 | 0.15 | 04/26/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 30 | | mg/L | 10 | 20 | 04/23/02 11:39 | lc |
| TDS (calculated) | Calculation | 303 | | mg/L | 10 | 50 | 04/26/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.12 | | | | | 04/26/02 0:00 | calc |

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

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DUGOUT MINE
Sample ID: SC14

ACZ ID: **L36493-01**
Date Sampled: 04/12/02 07:30
Date Received: 04/16/02
Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 94.6 | | mg/L | 0.2 | 1 | 04/25/02 16:35 | ct |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/25/02 16:35 | ct |
| Iron, total | M200.7 ICP | 0.39 | | mg/L | 0.01 | 0.05 | 04/30/02 17:18 | ct |
| Magnesium, dissolved | M200.7 ICP | 38.5 | | mg/L | 0.2 | 1 | 04/25/02 16:35 | ct |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/25/02 16:35 | ct |
| Manganese, total | M200.7 ICP | 0.023 | B | mg/L | 0.005 | 0.03 | 04/27/02 21:05 | bf |
| Potassium, dissolved | M200.7 ICP | 1.2 | | mg/L | 0.3 | 1 | 04/25/02 16:35 | ct |
| Sodium, dissolved | M200.7 ICP | 9.7 | | mg/L | 0.3 | 1 | 04/25/02 16:35 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 17:39 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 279 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Total Alkalinity | | 279 | | mg/L | 2 | 10 | 04/20/02 0:00 | lc |
| Cation-Anion Balance Calculation | | | | | | | | |
| Cation-Anion Balance | | 10.7 | | % | | | 04/26/02 0:00 | calc |
| Sum of Anions | | 6.7 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Sum of Cations | | 8.3 | | meq/L | 0.1 | 0.5 | 04/26/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 4 | B | mg/L | 1 | 5 | 04/23/02 15:53 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 420 | | mg/L | 10 | 20 | 04/08/02 12:47 | teb |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.21 | | | 0.03 | 0.15 | 04/26/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 50 | | mg/L | 10 | 20 | 04/23/02 11:36 | lc |
| TDS (calculated) | Calculation | 365 | | mg/L | 10 | 50 | 04/26/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.15 | | | | | 04/26/02 0:00 | calc |

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

Soldier Creek Coal Company

Project ID: 2ND QTR
 Sample ID: SC65

ACZ ID: L36454-05

Date Sampled: 04/09/02 14:25
 Date Received: 04/12/02
 Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|---------------|---------|
| Calcium, dissolved | M200.7 ICP | 63.3 | | mg/L | 0.2 | 1 | 04/21/02 4:47 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 04/21/02 4:47 | bf |
| Iron, total | M200.7 ICP | 0.27 | | mg/L | 0.01 | 0.05 | 04/24/02 4:34 | bf |
| Magnesium, dissolved | M200.7 ICP | 49.7 | | mg/L | 0.2 | 1 | 04/21/02 4:47 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 04/21/02 4:47 | bf |
| Manganese, total | M200.7 ICP | 0.014 | B | mg/L | 0.005 | 0.03 | 04/24/02 4:34 | bf |
| Potassium, dissolved | M200.7 ICP | 2.1 | | mg/L | 0.3 | 1 | 04/21/02 4:47 | bf |
| Sodium, dissolved | M200.7 ICP | 47.2 | | mg/L | 0.3 | 1 | 04/21/02 4:47 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 04/18/02 2:49 | ct |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B | | | | | | | |
| Bicarbonate as CaCO3 | | 293 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Total Alkalinity | | 293 | | mg/L | 2 | 10 | 04/19/02 0:00 | lc |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 10.7 | | % | | | 04/24/02 0:00 | calc |
| Sum of Anions | | 7.5 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Sum of Cations | | 9.3 | | meq/L | 0.1 | 0.5 | 04/24/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric (RFA) | 6 | | mg/L | 1 | 5 | 04/23/02 14:33 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 460 | | mg/L | 10 | 20 | 04/16/02 17:26 | teb |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 1.09 | | | 0.03 | 0.15 | 04/24/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 70 | | mg/L | 10 | 20 | 04/23/02 11:49 | lc |
| TDS (calculated) | Calculation | 414 | | mg/L | 10 | 50 | 04/24/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.11 | | | | | 04/24/02 0:00 | calc |

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

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID: DC-2
 Sample ID: D-2 DC-2

ACZ ID: L37279-01

Date Sampled: 06/14/02 10:30

Date Received: 06/18/02

Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/26/02 14:36 | ecr |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 342 | | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Total Alkalinity | | 342 | | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 0.5 | | % | | | 07/05/02 0:00 | calc |
| Sum of Anions | | 9.7 | | meq/L | 0.1 | 0.5 | 07/05/02 0:00 | calc |
| Sum of Cations | | 9.8 | | meq/L | 0.1 | 0.5 | 07/05/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric | 8 | | mg/L | 1 | 5 | 06/24/02 16:05 | ksj |
| Hardness as CaCO3 | SM2340B - Calculation | 413 | | mg/L | 1 | 7 | 07/05/02 0:00 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/18/02 15:24 | lsa |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 0.08 | B | mg/L | 0.05 | 0.3 | 06/22/02 12:31 | ctt |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 06/19/02 16:00 | hap |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 490 | | mg/L | 10 | 20 | 06/20/02 21:50 | wfg |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | 12 | B | mg/L | 5 | 20 | 06/18/02 20:58 | wfg |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.73 | | | 0.03 | 0.15 | 07/05/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 130 | | mg/L | 10 | 20 | 12/30/99 15:35 | wfg |
| TDS (calculated) | Calculation | 505 | | mg/L | 10 | 50 | 07/05/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.97 | | | | | 07/05/02 0:00 | calc |

Note: The Nitrogen Ammonia value is estimated due to matrix interferences.

Soldier Creek Coal Company

Project ID: DC-2
 Sample ID: D-2

ACZ ID: L37279-01
 Date Sampled: 06/14/02 10:30
 Date Received: 06/18/02
 Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/13/02 19:50 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | 0.0006 | B | mg/L | 0.0005 | 0.003 | 07/06/02 16:47 | jb |
| Boron, dissolved | M200.7 ICP | 0.05 | | mg/L | 0.01 | 0.05 | 07/09/02 19:03 | kdw |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/06/02 16:47 | jb |
| Calcium, dissolved | M200.7 ICP | 64.5 | | mg/L | 0.2 | 1 | 07/13/02 19:50 | bf |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/09/02 19:03 | kdw |
| Iron, dissolved | M200.7 ICP | 0.02 | B | mg/L | 0.01 | 0.05 | 07/09/02 19:03 | kdw |
| Iron, total | M200.7 ICP | 0.09 | | mg/L | 0.01 | 0.05 | 07/05/02 22:22 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0002 | 0.001 | 07/10/02 5:16 | lcj |
| Magnesium, dissolved | M200.7 ICP | 61.2 | | mg/L | 0.2 | 1 | 07/09/02 19:03 | kdw |
| Manganese, dissolved | M200.7 ICP | 0.007 | B | mg/L | 0.005 | 0.03 | 07/17/02 11:27 | bf |
| Manganese, total | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 06/27/02 23:30 | kdw |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/09/02 19:03 | kdw |
| Potassium, dissolved | M200.7 ICP | 2.6 | | mg/L | 0.3 | 1 | 07/09/02 19:03 | kdw |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/01/02 16:15 | dm/kw |
| Sodium, dissolved | M200.7 ICP | 33.7 | | mg/L | 0.3 | 1 | 07/09/02 19:03 | kdw |
| Zinc, dissolved | M200.7 ICP | 0.01 | B | mg/L | 0.01 | 0.05 | 07/17/02 21:41 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 07/03/02 11:45 | dln |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: 5

ACZ ID: L37279-02

Date Sampled: 06/14/02 12:00

Date Received: 06/18/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 88.9 | | mg/L | 0.2 | 1 | 07/03/02 13:59 | kdw |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/09/02 19:21 | kdw |
| Iron, total | M200.7 ICP | 0.17 | | mg/L | 0.01 | 0.05 | 07/05/02 22:35 | bf |
| Magnesium, dissolved | M200.7 ICP | 31.0 | | mg/L | 0.2 | 1 | 07/03/02 13:59 | kdw |
| Manganese, dissolved | M200.7 ICP | 0.014 | B | mg/L | 0.005 | 0.03 | 07/03/02 13:59 | kdw |
| Manganese, total | M200.7 ICP | 0.016 | B | mg/L | 0.005 | 0.03 | 06/27/02 23:35 | kdw |
| Potassium, dissolved | M200.7 ICP | 1.1 | | mg/L | 0.3 | 1 | 07/03/02 13:59 | kdw |
| Sodium, dissolved | M200.7 ICP | 13.8 | | mg/L | 0.3 | 1 | 07/03/02 13:59 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 07/03/02 12:07 | dln |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO ₃ | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO ₃ | | 303 | | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Carbonate as CaCO ₃ | | | U | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Hydroxide as CaCO ₃ | | | U | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Total Alkalinity | | 303 | | mg/L | 2 | 10 | 06/18/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.0 | | % | | | 07/05/02 0:00 | calc |
| Sum of Anions | | 7.3 | | meq/L | 0.1 | 0.5 | 07/05/02 0:00 | calc |
| Sum of Cations | | 7.6 | | meq/L | 0.1 | 0.5 | 07/05/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric | 8 | | mg/L | 1 | 5 | 06/24/02 16:05 | ksj |
| Hardness as CaCO ₃ | SM2340B - Calculation | 350 | | mg/L | 1 | 7 | 07/05/02 0:00 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/18/02 15:48 | isa |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 360 | | mg/L | 10 | 20 | 06/20/02 21:51 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.32 | | | 0.03 | 0.15 | 07/05/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 50 | | mg/L | 10 | 20 | 12/30/99 15:39 | wfg |
| TDS (calculated) | Calculation | 375 | | mg/L | 10 | 50 | 07/05/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.96 | | | | | 07/05/02 0:00 | calc |

Soldier Creek Coal Company

Project ID:

Sample ID: SP-20

ACZ ID: L37352-01

Date Sampled: 06/18/02 09:02

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 0.06 | B | mg/L | 0.03 | 0.2 | 07/18/02 0:28 | kdw |
| Arsenic, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0005 | 0.003 | 07/10/02 11:38 | lcj |
| Boron, dissolved | M200.7 ICP | 0.03 | B | mg/L | 0.01 | 0.05 | 07/14/02 21:40 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 11:38 | lcj |
| Calcium, dissolved | M200.7 ICP | 84.2 | | mg/L | 0.2 | 1 | 07/14/02 21:40 | bf |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 0:28 | kdw |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/14/02 21:40 | bf |
| Iron, total | M200.7 ICP | 0.63 | | mg/L | 0.01 | 0.05 | 07/19/02 14:34 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 11:38 | lcj |
| Magnesium, dissolved | M200.7 ICP | 30.6 | | mg/L | 0.2 | 1 | 07/14/02 21:40 | bf |
| Manganese, dissolved | M200.7 ICP | 0.006 | B | mg/L | 0.005 | 0.03 | 07/18/02 0:28 | kdw |
| Manganese, total | M200.7 ICP | 0.033 | | mg/L | 0.005 | 0.03 | 07/19/02 14:34 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/14/02 21:40 | bf |
| Potassium, dissolved | M200.7 ICP | 1.2 | | mg/L | 0.3 | 1 | 07/18/02 0:28 | kdw |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/09/02 14:11 | kdw |
| Sodium, dissolved | M200.7 ICP | 12.5 | | mg/L | 0.3 | 1 | 07/18/02 0:28 | kdw |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/14/02 21:40 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 2:36 | djm |

Soldier Creek Coal Company

Project ID:
 Sample ID: SP-20

ACZ ID: **L37352-01**
 Date Sampled: 06/18/02 09:02
 Date Received: 06/21/02
 Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 9:51 | hap |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 302 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 302 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 5.8 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 6.5 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 7.3 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 4 | B | mg/L | 1 | 5 | 06/29/02 11:17 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 336 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:14 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | | U | mg/L | 0.05 | 0.3 | 06/25/02 11:56 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 330 | | mg/L | 10 | 20 | 06/21/02 20:20 | wfg |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.30 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 20 | | mg/L | 10 | 20 | 06/21/02 14:15 | wfg |
| TDS (calculated) | Calculation | 334 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.99 | | | | | 07/26/02 13:52 | calc |

Note: The Aluminum, Potassium, Sodium and Zinc values are estimated due to matrix interferences.

Soldier Creek Coal Company
 Project ID:
 Sample ID: DC-3

ACZ ID: **L37194-01**
 Date Sampled: 06/06/02 00:00
 Date Received: 06/10/02
 Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 67.5 | | mg/L | 0.2 | 1 | 06/30/02 17:41 | kr |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 06/30/02 17:41 | kr |
| Iron, total | M200.7 ICP | 0.20 | | mg/L | 0.01 | 0.05 | 06/18/02 23:41 | ct |
| Magnesium, dissolved | M200.7 ICP | 48.6 | | mg/L | 0.2 | 1 | 06/30/02 4:17 | ct |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 06/30/02 17:41 | kr |
| Manganese, total | M200.7 ICP | 0.005 | B | mg/L | 0.005 | 0.03 | 06/18/02 23:41 | ct |
| Potassium, dissolved | M200.7 ICP | 2.2 | | mg/L | 0.3 | 1 | 06/30/02 17:41 | kr |
| Sodium, dissolved | M200.7 ICP | 19.8 | | mg/L | 0.3 | 1 | 07/08/02 23:30 | ct |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/17/02 10:04 | dim |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 269 | | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Total Alkalinity | | 269 | | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.5 | | % | | | 07/10/02 0:00 | calc |
| Sum of Anions | | 7.8 | | meq/L | 0.1 | 0.5 | 07/10/02 0:00 | calc |
| Sum of Cations | | 8.2 | | meq/L | 0.1 | 0.5 | 07/10/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric | 6 | | mg/L | 1 | 5 | 06/21/02 10:12 | ctt |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 06/13/02 14:30 | er/hp |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 430 | | mg/L | 10 | 20 | 06/13/02 16:03 | wfg |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | 22 | | mg/L | 5 | 20 | 06/12/02 12:29 | jmr |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.45 | | | 0.03 | 0.15 | 07/10/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 110 | | mg/L | 10 | 20 | 06/11/02 15:44 | jmr |
| TDS (calculated) | Calculation | 416 | | mg/L | 10 | 50 | 07/10/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.03 | | | | | 07/10/02 0:00 | calc |

Note: The TDS value is estimated due to a high LCSW recovery.

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: DC-4

ACZ ID: L37194-02

Date Sampled: 06/06/02 00:00

Date Received: 06/10/02

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 69.6 | | mg/L | 0.2 | 1 | 07/13/02 19:46 | bf |
| Iron, dissolved | M200.7 ICP | 0.02 | B | mg/L | 0.01 | 0.05 | 07/12/02 20:18 | bf |
| Iron, total | M200.7 ICP | 0.27 | | mg/L | 0.01 | 0.05 | 06/18/02 23:46 | ct |
| Magnesium, dissolved | M200.7 ICP | 54.7 | | mg/L | 0.2 | 1 | 07/12/02 20:18 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 07/09/02 22:33 | kdw |
| Manganese, total | M200.7 ICP | 0.009 | B | mg/L | 0.005 | 0.03 | 06/18/02 23:46 | ct |
| Potassium, dissolved | M200.7 ICP | 2.6 | | mg/L | 0.3 | 1 | 07/12/02 20:18 | bf |
| Sodium, dissolved | M200.7 ICP | 22.5 | | mg/L | 0.3 | 1 | 07/16/02 22:26 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/17/02 10:36 | djm |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|-----------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 287 | | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Total Alkalinity | | 287 | | mg/L | 2 | 10 | 06/14/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.3 | | % | | | 07/10/02 0:00 | calc |
| Sum of Anions | | 8.6 | | meq/L | 0.1 | 0.5 | 07/10/02 0:00 | calc |
| Sum of Cations | | 9.0 | | meq/L | 0.1 | 0.5 | 07/10/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric | 7 | | mg/L | 1 | 5 | 06/21/02 10:12 | ctf |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 06/13/02 15:05 | er/hp |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 480 | | mg/L | 10 | 20 | 06/13/02 16:05 | wfg |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | 14 | B | mg/L | 5 | 20 | 06/11/02 17:01 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.49 | | | 0.03 | 0.15 | 07/10/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 130 | | mg/L | 10 | 20 | 06/11/02 15:47 | jmr |
| TDS (calculated) | Calculation | 459 | | mg/L | 10 | 50 | 07/10/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.05 | | | | | 07/10/02 0:00 | calc |

Note: The TDS value is estimated due to a high LCSW recovery.

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: SC-14

ACZ ID: L37352-02

Date Sampled: 06/18/02 09:31

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 0.04 | B | mg/L | 0.03 | 0.2 | 07/18/02 23:32 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | 0.0006 | B | mg/L | 0.0005 | 0.003 | 07/11/02 20:51 | jb |
| Boron, dissolved | M200.7 ICP | 0.03 | B | mg/L | 0.01 | 0.05 | 07/18/02 23:32 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/11/02 20:51 | jb |
| Calcium, dissolved | M200.7 ICP | 105 | | mg/L | 0.2 | 1 | 07/18/02 0:32 | kdw |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:32 | bf |
| Iron, dissolved | M200.7 ICP | 0.05 | | mg/L | 0.01 | 0.05 | 07/19/02 20:04 | bf |
| Iron, total | M200.7 ICP | 2.90 | | mg/L | 0.01 | 0.05 | 07/19/02 14:37 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/11/02 20:51 | jb |
| Magnesium, dissolved | M200.7 ICP | 39.2 | | mg/L | 0.2 | 1 | 07/18/02 23:32 | bf |
| Manganese, dissolved | M200.7 ICP | 0.027 | B | mg/L | 0.005 | 0.03 | 07/18/02 23:32 | bf |
| Manganese, total | M200.7 ICP | 0.182 | | mg/L | 0.005 | 0.03 | 07/19/02 14:37 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:32 | bf |
| Potassium, dissolved | M200.7 ICP | 1.5 | | mg/L | 0.3 | 1 | 07/18/02 23:32 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | 0.001 | B | mg/L | 0.001 | 0.005 | 07/09/02 14:13 | kdw |
| Sodium, dissolved | M200.7 ICP | 11.9 | | mg/L | 0.3 | 1 | 07/18/02 23:32 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 0:32 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 3:12 | dim |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: SC-14

ACZ ID: L37352-02

Date Sampled: 06/18/02 09:31

Date Received: 06/21/02

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/26/02 15:42 | ecr |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 359 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 359 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.9 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 8.5 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 9.0 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 4 | B | mg/L | 1 | 5 | 06/29/02 11:18 | cit |
| Hardness as CaCO3 | SM2340B - Calculation | 424 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:19 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 0.07 | B | mg/L | 0.05 | 0.3 | 06/25/02 11:57 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 420 | | mg/L | 10 | 20 | 06/21/02 20:21 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.25 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 60 | | mg/L | 10 | 20 | 06/21/02 14:17 | wfg |
| TDS (calculated) | Calculation | 437 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.96 | | | | | 07/26/02 13:52 | calc |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: SC-65

ACZ ID: L37352-03

Date Sampled: 06/18/02 10:23

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | 0.04 | B | mg/L | 0.03 | 0.2 | 07/18/02 23:36 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | 0.0005 | B | mg/L | 0.0005 | 0.003 | 07/10/02 11:53 | lcj |
| Boron, dissolved | M200.7 ICP | 0.09 | | mg/L | 0.01 | 0.05 | 07/18/02 23:36 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 11:53 | lcj |
| Calcium, dissolved | M200.7 ICP | 83.5 | | mg/L | 0.2 | 1 | 07/18/02 0:37 | kdw |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:36 | bf |
| Iron, dissolved | M200.7 ICP | 0.05 | B | mg/L | 0.01 | 0.05 | 07/19/02 20:08 | bf |
| Iron, total | M200.7 ICP | 4.09 | | mg/L | 0.01 | 0.05 | 07/19/02 14:41 | bf |
| Lead, dissolved | M200.8 ICP-MS | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 07/10/02 11:53 | lcj |
| Magnesium, dissolved | M200.7 ICP | 49.9 | | mg/L | 0.2 | 1 | 07/18/02 23:36 | bf |
| Manganese, dissolved | M200.7 ICP | 0.028 | B | mg/L | 0.005 | 0.03 | 07/18/02 23:36 | bf |
| Manganese, total | M200.7 ICP | 0.296 | | mg/L | 0.005 | 0.03 | 07/19/02 14:41 | bf |
| Molybdenum, dissolved | M200.7 ICP | 0.01 | B | mg/L | 0.01 | 0.05 | 07/18/02 23:36 | bf |
| Potassium, dissolved | M200.7 ICP | 2.4 | | mg/L | 0.3 | 1 | 07/18/02 23:36 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | 0.001 | B | mg/L | 0.001 | 0.005 | 07/09/02 14:14 | kdw |
| Sodium, dissolved | M200.7 ICP | 44.9 | | mg/L | 0.3 | 1 | 07/18/02 23:36 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 0:37 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 3:48 | djm |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: SC-65

ACZ ID: L37352-03

Date Sampled: 06/18/02 10:23

Date Received: 06/21/02

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/26/02 16:48 | ecr |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 362 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 362 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 7.9 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 8.8 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 10.3 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 6 | | mg/L | 1 | 5 | 06/29/02 11:19 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 414 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:23 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | | U | mg/L | 0.05 | 0.3 | 06/25/02 11:57 | ksj |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 450 | | mg/L | 10 | 20 | 06/21/02 20:24 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.97 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 70 | | mg/L | 10 | 20 | 06/21/02 14:21 | wfg |
| TDS (calculated) | Calculation | 474 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.95 | | | | | 07/26/02 13:52 | calc |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: SC-116

ACZ ID: L37352-04

Date Sampled: 06/18/02 11:30

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/18/02 23:52 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0005 | 0.003 | 07/10/02 11:58 | lcj |
| Boron, dissolved | M200.7 ICP | 0.03 | B | mg/L | 0.01 | 0.05 | 07/18/02 23:52 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 07/10/02 11:58 | lcj |
| Calcium, dissolved | M200.7 ICP | 84.0 | | mg/L | 0.2 | 1 | 07/18/02 0:41 | kdw |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:52 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 20:12 | bf |
| Iron, total | M200.7 ICP | 0.52 | | mg/L | 0.01 | 0.05 | 07/19/02 14:44 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 11:58 | lcj |
| Magnesium, dissolved | M200.7 ICP | 50.8 | | mg/L | 0.2 | 1 | 07/18/02 23:52 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 07/18/02 23:52 | bf |
| Manganese, total | M200.7 ICP | 0.052 | | mg/L | 0.005 | 0.03 | 07/19/02 14:44 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:52 | bf |
| Potassium, dissolved | M200.7 ICP | 1.2 | | mg/L | 0.3 | 1 | 07/18/02 23:52 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/09/02 14:16 | kdw |
| Sodium, dissolved | M200.7 ICP | 11.8 | | mg/L | 0.3 | 1 | 07/18/02 23:52 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 0:41 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 4:24 | djm |

Soldier Creek Coal Company

Project ID:

Sample ID: SC-116

ACZ ID: L37352-04

Date Sampled: 06/18/02 11:30

Date Received: 06/21/02

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 10:02 | hap |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 300 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 300 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 4.1 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 8.2 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 8.9 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 4 | B | mg/L | 1 | 5 | 06/29/02 11:20 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 419 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:27 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | | U | mg/L | 0.05 | 0.3 | 07/02/02 10:02 | clt |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 440 | | mg/L | 10 | 20 | 06/21/02 20:25 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.25 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 100 | | mg/L | 10 | 20 | 06/21/02 14:23 | wfg |
| TDS (calculated) | Calculation | 432 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.02 | | | | | 07/26/02 13:52 | calc |

Soldier Creek Coal Company

Project ID:

Sample ID: 203

ACZ ID: L37352-05

Date Sampled: 06/18/02 12:10

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|--------------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/18/02 23:55 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0005 | 0.003 | 07/10/02 12:03 | lcj |
| Boron, dissolved | M200.7 ICP | 0.06 | | mg/L | 0.01 | 0.05 | 07/18/02 23:55 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:03 | lcj |
| Calcium, dissolved | M200.7 ICP | 92.2 | | mg/L | 0.2 | 1 | 07/18/02 0:54 | kdw |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:55 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 20:17 | bf |
| Iron, total | M200.7 ICP | 0.08 | | mg/L | 0.01 | 0.05 | 07/19/02 14:47 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:03 | lcj |
| Magnesium, dissolved | M200.7 ICP | 63.2 | | mg/L | 0.2 | 1 | 07/18/02 23:55 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 07/18/02 23:55 | bf |
| Manganese, total | M200.7 ICP | 0.023 | B | mg/L | 0.005 | 0.03 | 07/19/02 14:47 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 23:55 | bf |
| Potassium, dissolved | M200.7 ICP | 2.4 | | mg/L | 0.3 | 1 | 07/18/02 23:55 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/09/02 14:17 | kdw |
| Sodium, dissolved | M200.7 ICP | 46.5 | | mg/L | 0.3 | 1 | 07/18/02 23:55 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 0:54 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|------------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 5:00 | dln |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: 203

ACZ ID: L37352-05

Date Sampled: 06/18/02 12:10

Date Received: 06/21/02

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 10:14 | hap |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 363 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 363 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.1 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 11.4 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 11.9 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 7 | | mg/L | 1 | 5 | 06/29/02 11:21 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 490 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:31 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | | U | mg/L | 0.05 | 0.3 | 07/02/02 10:03 | clt |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 620 | | mg/L | 10 | 20 | 06/21/02 20:26 | wfg |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.92 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 190 | | mg/L | 10 | 20 | 06/21/02 14:25 | wfg |
| TDS (calculated) | Calculation | 619 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.00 | | | | | 07/26/02 13:52 | calc |

ACZ Laboratories, Inc.

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: 260

ACZ ID: L37352-06

Date Sampled: 06/18/02 13:00

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/19/02 0:07 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0005 | 0.003 | 07/10/02 12:08 | lcj |
| Boron, dissolved | M200.7 ICP | 0.01 | B | mg/L | 0.01 | 0.05 | 07/19/02 0:07 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | 0.0001 | B | mg/L | 0.0001 | 0.0005 | 07/10/02 12:08 | lcj |
| Calcium, dissolved | M200.7 ICP | 85.5 | | mg/L | 0.2 | 1 | 07/18/02 1:12 | kdw |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 0:07 | bf |
| Iron, dissolved | M200.7 ICP | 0.15 | | mg/L | 0.01 | 0.05 | 07/19/02 20:30 | bf |
| Iron, total | M200.7 ICP | 0.09 | | mg/L | 0.01 | 0.05 | 07/19/02 14:51 | bf |
| Lead, dissolved | M200.8 ICP-MS | 0.0002 | B | mg/L | 0.0001 | 0.0005 | 07/10/02 12:08 | lcj |
| Magnesium, dissolved | M200.7 ICP | 31.2 | | mg/L | 0.2 | 1 | 07/19/02 0:07 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 07/19/02 0:07 | bf |
| Manganese, total | M200.7 ICP | 0.017 | B | mg/L | 0.005 | 0.03 | 07/19/02 14:51 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 0:07 | bf |
| Potassium, dissolved | M200.7 ICP | 1.0 | | mg/L | 0.3 | 1 | 07/19/02 0:07 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | 0.001 | B | mg/L | 0.001 | 0.005 | 07/09/02 14:22 | kdw |
| Sodium, dissolved | M200.7 ICP | 14.5 | | mg/L | 0.3 | 1 | 07/19/02 0:07 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/18/02 1:12 | kdw |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 5:36 | djm |

ACZ Laboratories, Inc.

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: 260

ACZ ID: L37352-06

Date Sampled: 06/18/02 13:00

Date Received: 06/21/02

Sample Matrix: Ground Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 10:25 | hap |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 246 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 246 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 14.5 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 5.6 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 7.5 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 4 | B | mg/L | 1 | 5 | 06/29/02 11:22 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 342 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:35 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | | U | mg/L | 0.05 | 0.3 | 07/02/02 10:04 | clt |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 300 | | mg/L | 10 | 20 | 06/21/02 20:27 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.34 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 30 | | mg/L | 10 | 20 | 06/21/02 14:27 | wfg |
| TDS (calculated) | Calculation | 314 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.96 | | | | | 07/26/02 13:52 | calc |

Soldier Creek Coal Company

Project ID:

Sample ID: DC-5

ACZ ID: **L37352-07**

Date Sampled: 06/18/02 15:20

Date Received: 06/21/02

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/19/02 2:19 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | 0.0006 | B | mg/L | 0.0005 | 0.003 | 07/10/02 12:13 | lcj |
| Boron, dissolved | M200.7 ICP | 0.07 | | mg/L | 0.01 | 0.05 | 07/19/02 2:19 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:13 | lcj |
| Calcium, dissolved | M200.7 ICP | 63.8 | | mg/L | 0.2 | 1 | 07/19/02 2:19 | bf |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 2:19 | bf |
| Iron, dissolved | M200.7 ICP | 0.01 | B | mg/L | 0.01 | 0.05 | 07/19/02 20:34 | bf |
| Iron, total | M200.7 ICP | 0.10 | | mg/L | 0.01 | 0.05 | 07/19/02 14:54 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:13 | lcj |
| Magnesium, dissolved | M200.7 ICP | 60.7 | | mg/L | 0.2 | 1 | 07/19/02 2:19 | bf |
| Manganese, dissolved | M200.7 ICP | 0.010 | B | mg/L | 0.005 | 0.03 | 07/19/02 2:19 | bf |
| Manganese, total | M200.7 ICP | 0.013 | B | mg/L | 0.005 | 0.03 | 07/19/02 14:54 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/20/02 15:14 | bf |
| Potassium, dissolved | M200.7 ICP | 2.8 | | mg/L | 0.3 | 1 | 07/19/02 20:34 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/09/02 14:23 | kdw |
| Sodium, dissolved | M200.7 ICP | 35.5 | | mg/L | 0.3 | 1 | 07/19/02 20:34 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 2:19 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 6:12 | dIm |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: DC-5

ACZ ID: L37352-07

Date Sampled: 06/18/02 15:20

Date Received: 06/21/02

Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 10:36 | hap |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 320 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Total Alkalinity | | 320 | | mg/L | 2 | 10 | 06/24/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.6 | | % | | | 07/26/02 13:52 | calc |
| Sum of Anions | | 9.3 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Sum of Cations | | 9.8 | | meq/L | 0.1 | 0.5 | 07/26/02 13:52 | calc |
| Chloride | M325.2 - Colorimetric | 8 | | mg/L | 1 | 5 | 06/29/02 11:22 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 409 | | mg/L | 1 | 7 | 07/26/02 13:52 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:39 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 0.13 | B | mg/L | 0.05 | 0.3 | 07/02/02 10:04 | clt |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 07/03/02 15:25 | hap/e |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 490 | | mg/L | 10 | 20 | 06/21/02 20:28 | wfg |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | | U | mg/L | 5 | 20 | 06/21/02 18:53 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 0.77 | | | 0.03 | 0.15 | 07/26/02 13:52 | calc |
| Sulfate | M375.3 - Gravimetric | 130 | | mg/L | 10 | 20 | 06/21/02 14:29 | wfg |
| TDS (calculated) | Calculation | 493 | | mg/L | 10 | 50 | 07/26/02 13:52 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.99 | | | | | 07/26/02 13:52 | calc |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: PC1A

ACZ ID: L37352-08

Date Sampled: 06/18/02 12:17

Date Received: 06/21/02

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/19/02 2:23 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0005 | 0.003 | 07/10/02 12:18 | lcj |
| Boron, dissolved | M200.7 ICP | 0.04 | B | mg/L | 0.01 | 0.05 | 07/19/02 2:23 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:18 | lcj |
| Calcium, dissolved | M200.7 ICP | 72.6 | | mg/L | 0.2 | 1 | 07/19/02 2:23 | bf |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 2:23 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 20:38 | bf |
| Iron, total | M200.7 ICP | 1.06 | | mg/L | 0.01 | 0.05 | 06/29/02 19:41 | ct |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:18 | lcj |
| Magnesium, dissolved | M200.7 ICP | 49.3 | | mg/L | 0.2 | 1 | 07/19/02 2:23 | bf |
| Manganese, dissolved | M200.7 ICP | 0.019 | B | mg/L | 0.005 | 0.03 | 07/19/02 2:23 | bf |
| Manganese, total | M200.7 ICP | 0.023 | B | mg/L | 0.005 | 0.03 | 06/27/02 1:36 | bf |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/20/02 15:17 | bf |
| Potassium, dissolved | M200.7 ICP | 2.4 | | mg/L | 0.3 | 1 | 07/19/02 20:38 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/09/02 14:25 | kdw |
| Sodium, dissolved | M200.7 ICP | 29.7 | | mg/L | 0.3 | 1 | 07/19/02 20:38 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 2:23 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/26/02 0:48 | djm |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: PC1A

ACZ ID: L37352-08

Date Sampled: 06/18/02 12:17

Date Received: 06/21/02

Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO ₃ | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 10:48 | hap |
| Alkalinity as CaCO ₃ | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO ₃ | | 340 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Carbonate as CaCO ₃ | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Hydroxide as CaCO ₃ | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Total Alkalinity | | 340 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 2.9 | | % | | | 07/26/02 13:53 | calc |
| Sum of Anions | | 8.5 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Sum of Cations | | 9.0 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Chloride | M325.2 - Colorimetric | 3 | B | mg/L | 1 | 5 | 06/29/02 11:23 | clt |
| Hardness as CaCO ₃ | SM2340B - Calculation | 384 | | mg/L | 1 | 7 | 07/26/02 13:53 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:43 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | 0.15 | B | mg/L | 0.05 | 0.3 | 07/02/02 10:05 | clt |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 07/03/02 20:51 | hap/e |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 450 | | mg/L | 10 | 20 | 06/21/02 20:29 | wfg |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | 110 | | mg/L | 5 | 20 | 06/21/02 19:50 | wfg |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 0.66 | | | 0.03 | 0.15 | 07/26/02 13:53 | calc |
| Sulfate | M375.3 - Gravimetric | 80 | | mg/L | 10 | 20 | 06/21/02 14:31 | wfg |
| TDS (calculated) | Calculation | 441 | | mg/L | 10 | 50 | 07/26/02 13:53 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.02 | | | | | 07/26/02 13:53 | calc |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: PC2

ACZ ID: L37352-09

Date Sampled: 06/18/02 14:00

Date Received: 06/21/02

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------|-----------------------|--------|------|-------|--------|--------|----------------|---------|
| Aluminum, dissolved | M200.7 ICP | | U | mg/L | 0.03 | 0.2 | 07/19/02 2:27 | bf |
| Arsenic, dissolved | M200.8 ICP-MS | 0.0007 | B | mg/L | 0.0005 | 0.003 | 07/10/02 12:23 | lcj |
| Boron, dissolved | M200.7 ICP | 0.09 | | mg/L | 0.01 | 0.05 | 07/19/02 2:27 | bf |
| Cadmium, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:23 | lcj |
| Calcium, dissolved | M200.7 ICP | 81.7 | | mg/L | 0.2 | 1 | 07/19/02 2:27 | bf |
| Copper, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 2:27 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 20:42 | bf |
| Iron, total | M200.7 ICP | 0.15 | | mg/L | 0.01 | 0.05 | 07/25/02 19:12 | bf |
| Lead, dissolved | M200.8 ICP-MS | | U | mg/L | 0.0001 | 0.0005 | 07/10/02 12:23 | lcj |
| Magnesium, dissolved | M200.7 ICP | 83.4 | | mg/L | 0.2 | 1 | 07/19/02 2:27 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 07/19/02 2:27 | bf |
| Manganese, total | M200.7 ICP | 0.011 | B | mg/L | 0.005 | 0.03 | 07/22/02 20:28 | ct |
| Molybdenum, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/20/02 15:28 | bf |
| Potassium, dissolved | M200.7 ICP | 4.9 | | mg/L | 0.3 | 1 | 07/19/02 20:42 | bf |
| Selenium, dissolved | SM 3114 C, AA-Hydride | | U | mg/L | 0.001 | 0.005 | 07/09/02 14:26 | kdw |
| Sodium, dissolved | M200.7 ICP | 53.7 | | mg/L | 0.3 | 1 | 07/19/02 20:42 | bf |
| Zinc, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/20/02 15:28 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 07/24/02 19:07 | djm |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: PC2

ACZ ID: L37352-09

Date Sampled: 06/18/02 14:00

Date Received: 06/21/02

Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-------------------------------------|----------------------------|--------|------|-------|------|------|----------------|---------|
| Acidity as CaCO3 | SM2310B - Titration | | U | mg/L | 2 | 10 | 06/29/02 10:59 | hap |
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 347 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Carbonate as CaCO3 | | 17 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Total Alkalinity | | 364 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 0.8 | | % | | | 07/26/02 13:53 | calc |
| Sum of Anions | | 13.2 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Sum of Cations | | 13.4 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Chloride | M325.2 - Colorimetric | 10 | | mg/L | 1 | 5 | 06/29/02 11:24 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 547 | | mg/L | 1 | 7 | 07/26/02 13:53 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:47 | hap |
| Nitrogen, ammonia | M350.1 - Automated Phenate | | U | mg/L | 0.05 | 0.3 | 07/02/02 10:06 | clt |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 07/04/02 2:17 | hap/e |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 720 | | mg/L | 10 | 20 | 06/21/02 20:30 | wfg |
| Residue, Non-Filterable (TSS) @105C | M160.2 - Gravimetric | 6 | B | mg/L | 5 | 20 | 06/21/02 19:53 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 1.01 | | | 0.03 | 0.15 | 07/26/02 13:53 | calc |
| Sulfate | M375.3 - Gravimetric | 270 | | mg/L | 10 | 20 | 06/21/02 14:33 | wfg |
| TDS (calculated) | Calculation | 729 | | mg/L | 10 | 50 | 07/26/02 13:53 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.99 | | | | | 07/26/02 13:53 | calc |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: 10

ACZ ID: L37352-10

Date Sampled: 06/18/02 08:00

Date Received: 06/21/02

Sample Matrix: Ground Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 34.9 | | mg/L | 0.2 | 1 | 07/18/02 1:16 | kdw |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 20:59 | bf |
| Iron, total | M200.7 ICP | 0.03 | B | mg/L | 0.01 | 0.05 | 07/19/02 14:58 | bf |
| Magnesium, dissolved | M200.7 ICP | 29.2 | | mg/L | 0.2 | 1 | 07/18/02 21:32 | bf |
| Manganese, dissolved | M200.7 ICP | 0.009 | B | mg/L | 0.005 | 0.03 | 07/18/02 21:32 | bf |
| Manganese, total | M200.7 ICP | 0.011 | B | mg/L | 0.005 | 0.03 | 07/19/02 14:58 | bf |
| Potassium, dissolved | M200.7 ICP | 2.9 | | mg/L | 0.3 | 1 | 07/18/02 21:32 | bf |
| Sodium, dissolved | M200.7 ICP | 177 | | mg/L | 0.3 | 1 | 07/18/02 21:32 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|---------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 06/25/02 6:48 | djm |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 537 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Carbonate as CaCO3 | | 26 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Total Alkalinity | | 564 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | -1.6 | | % | | | 07/26/02 13:53 | calc |
| Sum of Anions | | 12.4 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Sum of Cations | | 12.0 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Chloride | M325.2 - Colorimetric | 41 | | mg/L | 1 | 5 | 06/29/02 11:26 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 207 | | mg/L | 1 | 7 | 07/26/02 13:53 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:51 | hap |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 650 | | mg/L | 10 | 20 | 06/21/02 20:31 | wfg |
| Sodium Absorption Ratio in Water | USGS - I1738-78 | 5.41 | | | 0.03 | 0.15 | 07/26/02 13:53 | calc |
| Sulfate | M375.3 - Gravimetric | | U | mg/L | 10 | 20 | 06/21/02 14:35 | wfg |
| TDS (calculated) | Calculation | 633 | | mg/L | 10 | 50 | 07/26/02 13:53 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.03 | | | | | 07/26/02 13:53 | calc |

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Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: G-7

ACZ ID: L37352-11

Date Sampled: 06/18/02 08:15

Date Received: 06/21/02

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 44.1 | | mg/L | 0.2 | 1 | 07/19/02 2:31 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 21:04 | bf |
| Iron, total | M200.7 ICP | 0.14 | | mg/L | 0.01 | 0.05 | 07/25/02 19:31 | bf |
| Magnesium, dissolved | M200.7 ICP | 40.5 | | mg/L | 0.2 | 1 | 07/19/02 2:31 | bf |
| Manganese, dissolved | M200.7 ICP | 0.026 | B | mg/L | 0.005 | 0.03 | 07/19/02 2:31 | bf |
| Manganese, total | M200.7 ICP | 0.030 | | mg/L | 0.005 | 0.03 | 07/22/02 20:32 | ct |
| Potassium, dissolved | M200.7 ICP | 2.1 | | mg/L | 0.3 | 1 | 07/19/02 21:04 | bf |
| Sodium, dissolved | M200.7 ICP | 113 | | mg/L | 0.3 | 1 | 07/19/02 21:04 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 07/24/02 20:48 | djm |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------|----------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 393 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Total Alkalinity | | 393 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Cation-Anion Balance Calculation | | | | | | | | |
| Cation-Anion Balance | | 5.0 | | % | | | 07/26/02 0:00 | calc |
| Sum of Anions | | 9.6 | | meq/L | 0.1 | 0.5 | 07/26/02 0:00 | calc |
| Sum of Cations | | 10.6 | | meq/L | 0.1 | 0.5 | 07/26/02 0:00 | calc |
| Chloride | M325.2 - Colorimetric | 12 | | mg/L | 1 | 5 | 06/29/02 11:28 | cit |
| Hardness as CaCO3 | SM2340B - Calculation | 277 | | mg/L | 1 | 7 | 07/26/02 0:00 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:55 | hap |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | See note | | | | | | N/A |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 520 | | mg/L | 10 | 20 | 06/21/02 20:32 | wfg |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 2.99 | | | 0.03 | 0.15 | 07/26/02 0:00 | calc |
| Sulfate | M375.3 - Gravimetric | 70 | | mg/L | 10 | 20 | 06/21/02 14:37 | wfg |
| TDS (calculated) | Calculation | 518 | | mg/L | 10 | 50 | 07/26/02 0:00 | calc |
| TDS (ratio - measured/calculated) | Calculation | 1.00 | | | | | 07/26/02 0:00 | calc |

Note: The Oil & Grease analysis was not performed due to insufficient sample volume.

Soldier Creek Coal Company

Project ID:
Sample ID: G-7

ACZ ID: **L37416-01**
Date Sampled: 06/24/02 00:00
Date Received: 06/27/02
Sample Matrix: Surface Water

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------------|---------------------|--------|------|-------|-----|-----|---------------|---------|
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 07/11/02 0:05 | ecr |

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company

Project ID:

Sample ID: G-6

ACZ ID: L37352-12

Date Sampled: 06/18/02 07:45

Date Received: 06/21/02

Sample Matrix: Surface Water

Metals Analysis

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|----------------------|------------|--------|------|-------|-------|------|----------------|---------|
| Calcium, dissolved | M200.7 ICP | 71.2 | | mg/L | 0.2 | 1 | 07/19/02 2:35 | bf |
| Iron, dissolved | M200.7 ICP | | U | mg/L | 0.01 | 0.05 | 07/19/02 21:08 | bf |
| Iron, total | M200.7 ICP | 0.19 | | mg/L | 0.01 | 0.05 | 07/25/02 19:44 | bf |
| Magnesium, dissolved | M200.7 ICP | 60.5 | | mg/L | 0.2 | 1 | 07/19/02 2:35 | bf |
| Manganese, dissolved | M200.7 ICP | | U | mg/L | 0.005 | 0.03 | 07/19/02 2:35 | bf |
| Manganese, total | M200.7 ICP | 0.013 | B | mg/L | 0.005 | 0.03 | 07/22/02 20:36 | ct |
| Potassium, dissolved | M200.7 ICP | 3.6 | | mg/L | 0.3 | 1 | 07/19/02 21:08 | bf |
| Sodium, dissolved | M200.7 ICP | 81.1 | | mg/L | 0.3 | 1 | 07/19/02 21:08 | bf |

Metals Prep

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|---------------------------|------------|--------|------|-------|-----|-----|----------------|---------|
| Total Hot Plate Digestion | M200.2 ICP | | | | | | 07/24/02 21:21 | dlm |

Wet Chemistry

| Parameter | EPA Method | Result | Qual | Units | MDL | PQL | Date | Analyst |
|-----------------------------------|-----------------------|--------|------|-------|------|------|----------------|---------|
| Alkalinity as CaCO3 | SM2320B - Titration | | | | | | | |
| Bicarbonate as CaCO3 | | 339 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Carbonate as CaCO3 | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Hydroxide as CaCO3 | | | U | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Total Alkalinity | | 339 | | mg/L | 2 | 10 | 06/22/02 0:00 | hap |
| Cation-Anion Balance | Calculation | | | | | | | |
| Cation-Anion Balance | | 3.8 | | % | | | 07/26/02 13:53 | calc |
| Sum of Anions | | 11.3 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Sum of Cations | | 12.2 | | meq/L | 0.1 | 0.5 | 07/26/02 13:53 | calc |
| Chloride | M325.2 - Colorimetric | 12 | | mg/L | 1 | 5 | 06/29/02 11:29 | clt |
| Hardness as CaCO3 | SM2340B - Calculation | 427 | | mg/L | 1 | 7 | 07/26/02 13:53 | calc |
| Lab Filtration | SM 3030 B | | | | | | 06/21/02 15:59 | hap |
| Oil & Grease, Total Recoverable | M1664 - Gravimetric | | U | mg/L | 2 | 10 | 07/04/02 13:08 | hap/e |
| Residue, Filterable (TDS) @180C | M160.1 - Gravimetric | 620 | | mg/L | 10 | 20 | 06/21/02 20:33 | wfg |
| Sodium Absorption Ratio in Water | USGS - 11738-78 | 1.73 | | | 0.03 | 0.15 | 07/26/02 13:53 | calc |
| Sulfate | M375.3 - Gravimetric | 200 | | mg/L | 10 | 20 | 06/21/02 14:39 | wfg |
| TDS (calculated) | Calculation | 632 | | mg/L | 10 | 50 | 07/26/02 13:53 | calc |
| TDS (ratio - measured/calculated) | Calculation | 0.98 | | | | | 07/26/02 13:53 | calc |



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL: 630-953-9300 FAX: 630-953-9306



Member of the SGS Group (Société Générale de Surveillance)

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020
HUNTINGTON, UT 84528
TEL: (435) 653-2311
FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542
DAVID SPILLMAN

Sample identification by
Soldier/Dugout Canyon Mines

ID:5

Kind of sample Water
reported to us

RECEIVED 0705
SAMPLED 1200

Sample taken at DUGOUT

Sample taken by VICKY MILLER

Date sampled June 13, 2002

Page 1 of 1

Date received June 14, 2002

Analysis report no. 59-24119

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-------------------|------|----|
| | | | | | Date/Time/Analyst | | |
| Nitrogen, Nitrate | 1.05 | 0.03 | mg/l as N | EPA 300.0 | 06-14-2002 | 1128 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-14-2002 | 1128 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-14-2002 | 1128 | SC |

FAXED
10-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory

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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542
DAVID SPILLMAN

Sample identification by
Soldier/Dugout Canyon Mines

ID:DC-2

Kind of sample Water
reported to us

RECEIVED 0705
SAMPLED 1030

Sample taken at DUGOUT

Sample taken by VICKY MILLER

Date sampled June 13, 2002

Page 1 of 1

Date received June 14, 2002

Analysis report no. 59-24120

| Parameter | Result | MRL | Units | Method | Analyzed | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|
| | | | | | Date/Time | Analyst |
| Nitrogen, Nitrate | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-14-2002 1128 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-14-2002 1128 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-14-2002 1128 | SC |

FAXED
6-27-02

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COMMERCIAL TESTING & ENGINEERING CO.

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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: SP-20

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 0902

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24138

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-------------------|------|----|
| | | | | | Date/Time/Analyst | | |
| Nitrogen, Nitrate-Nitrite | 0.07 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 | 0840 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 | 0840 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 | 0840 | SC |

FAXED
(4-27-02)

Respectfully submitted,
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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: SC-14

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 0931

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24139

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-------------------|----|--|
| | | | | | Date/Time/Analyst | | |
| Nitrogen, Nitrate-Nitrite | 0.27 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC | |

FAXED
6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: PC-2

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 1400

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24140

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-------------------|------|----|
| | | | | | Date/Time/Analyst | | |
| Nitrogen, Nitrate-Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 | 0840 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 | 0840 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 | 0840 | SC |

FAXED
6-27-02

Respectfully submitted,
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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: PC-1A

RECEIVED 1000
SAMPLED 1217

Kind of sample Water
reported to us

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24141

| Parameter | Result | MRL | Units | Method | Analyzed | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|
| | | | | | Date/Time | Analyst |
| Nitrogen, Nitrate-Nitrite | 0.12 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC |

FAXED
6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:DC-5

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 1520

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24142

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|--|
| | | | | | Date/Time | Analyst | |
| Nitrogen, Nitrate-Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC | |

FAXED
6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: 260

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 1300

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24143

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|--|
| | | | | | Date/Time | Analyst | |
| Nitrogen, Nitrate-Nitrite | 0.15 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC | |

FAXED
(6-22-02)

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory





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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:203

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 1210

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24144

| Parameter | Result | MRL | Units | Method | Analyzed | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|
| | | | | | Date/Time | Analyst |
| Nitrogen, Nitrate-Nitrite | 0.72 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC |

FAXED
6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: SC-65

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 1023

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24146

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|--|
| | | | | | Date/Time | Analyst | |
| Nitrogen, Nitrate-Nitrite | 0.17 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC | |

FAXED
6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory

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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID: SC-116

Kind of sample Water
reported to us

RECEIVED 1000
SAMPLED 1130

Sample taken at Soldier Canyon

Sample taken by R.K.

Date sampled June 18, 2002

Date received June 19, 2002

Page 1 of 1

Analysis report no. 59-24145

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-------------------|----|--|
| | | | | | Date/Time/Analyst | | |
| Nitrogen, Nitrate-Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-19-2002 0840 | SC | |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-19-2002 0840 | SC | |

FAXED
6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory

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June 11, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:DC-3

Kind of sample Water
reported to us

RECEIVED 1730
SAMPLED 1230

Sample taken at Soldier Canyon

Sample taken by Vicky Miller

Date sampled June 6, 2002

Date received June 6, 2002

Page 1 of 1

Analysis report no. 59-24073

| Parameter | Result | MRL | Units | Method | Analyzed | |
|------------------------------------|--------|------|-----------|-----------|-----------------|---------|
| | | | | | Date/Time | Analyst |
| Nitrogen, Nitrate-Nitrite | 0.04 | 0.03 | mg/l as N | EPA 300.0 | 06-07-2002 0935 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-07-2002 0935 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-07-2002 0935 | SC |

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory





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June 11, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:DC-4

Kind of sample Water
reported to us

RECEIVED 1730
SAMPLED 1200

Sample taken at Soldier Canyon

Sample taken by Vicky Miller

Date sampled June 6, 2002

Date received June 6, 2002

Page 1 of 1

Analysis report no. 59-24074

| Parameter | Result | MRL | Units | Method | Analyzed | | |
|------------------------------------|--------|------|-----------|-----------|-------------------|------|----|
| | | | | | Date/Time/Analyst | | |
| Nitrogen, Nitrate-Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-07-2002 | 0935 | SC |
| Nitrogen, Nitrite | <0.03 | 0.03 | mg/l as N | EPA 300.0 | 06-07-2002 | 0935 | SC |
| Phosphorous, Ortho-PO ₄ | <0.05 | 0.05 | mg/l as P | EPA 300.0 | 06-07-2002 | 0935 | SC |

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory



APPENDIX C

Legal Financial, Compliance and Related Information

Annual Report of Officers
As submitted to the Utah Department of Commerce

Other change in ownership and control information
As required under R645-301-110

CONTENTS

OFFICERS AND DIRECTORS

Officers and Directors

The following lists describe the officers and directors of Canyon Fuel Company, LLC, Arch Western Resources, LLC, Arch Coal, Inc., Itochu Corporation, and Itochu Coal International, Inc. The addresses for the officers, directors, representatives to the management board listed are the same as those of the respective business entities as listed above, for which the individuals are officers, directors or representatives.

ADDRESSES:

Canyon Fuel Company, LLC
6955 South Union Park Center, Suite 540
Midvale, UT 84047

Arch Western Resources, LLC
City Place One, Suite 300
St. Louis, MO 63141

Arch Coal, Inc.
City Place One, Suite 300
St. Louis, MO 63141

Delta Housing, Inc.
515 South Flower Street
Los Angeles, CA 90071

Atlantic Richfield Company
515 South Flower Street
Los Angeles, CA 90071

ITOCHU Coal International Inc.
555 17th Street, Suite 845
Denver, Colorado 80202

ITOCHU Corporation, 5-1
Kita-Aoyama 2-Chome
Minato-ku, Tokyo 107-77, Japan

CANYON FUEL COMPANY, LLC:

Directors:

Robert W. Shanks Chairman
Effective : 06/01/1998

Masayoshi Araya
Effective : 06/01/2001

Yuzo Hirono
Effective : 12/14/1999

Steven F. Leer
Effective : 06/01/1998

Kenneth G. Woodring
Effective : 12/01/2000

John W. Eaves Alternative Representative
Effective : 12/01/2000

Joe Y. Nakazawa Alternative Representative
Effective : 06/01/2001

Tsutomu Niwa Alternative Representative
Effective : 10/09/2001

Officers

Richard D. Pick President, Chief Executive Officer and General Manager
Effective : 06/01/1998

Robert J. Messey Chief Financial Officer
Effective : 10/09/2001

James E. Florczak Vice President, Finance
Effective : 05/25/1999

John W. Eaves Vice President, Marketing
Effective : 06/23/1998

Robert G. Jones Vice President, General Counsel and Assistant Secretary
Effective : 03/08/2000

Canyon Fuel Company, LLC
2002 Annual Report

Janet L. Hogan
Effective : 10/11/2000

Secretary

William H. Rose
Effective : 06/01/1998

Assistant Secretary

ARCH COAL, INC.:

2/03/03

Directors:

James R. Boyd
Effective : 07/01/1997

Chairman

Frank M. Burke
Effective : 09/07/2000

Robert G. Potter
Effective: 04/26/2001

Theodore D. Sands
Effective: 02/25/1999

Michael A. Perry
Effective: 09/28/1998

Douglas H. Hunt
Effective: 04/04/1995

Steven F. Leer
Effective: 07/1/1997

James L. Parker
Effective: 07/01/1997

Thomas A. Lockhart
Effective: 02/24/2003

Officers:

Steven F. Leer
Effective: 07/1/1997

President and Chief Executive Officer

Kenneth G. Woodring
Effective: 07/01/1997

Executive Vice President-Mining Operations

Canyon Fuel Company, LLC
2002 Annual Report

C. Henry Besten, Jr.
Effective: 07/01/1997

Vice President - Strategic Marketing

Larry R. Brown
Effective: 07/01/1997

Vice President & Chief Information Officer

John W. Eaves
Effective: 07/01/1997

Executive Vice President/COO

David B. Peugh
Effective: 07/01/1997

Vice President - Business Development

Robert W. Shanks
Effective: 07/01/1997

Vice President - Operations

William H. Rose
Effective: 04/22/1998

Vice President - Tax Planning

Robert J. Messey
Effective : 12/1/2000

Vice President, Chief Financial Officer

Robert G. Jones
Effective : 10/16/2000

Vice President, General Counsel and Secretary

James E. Florczak
Effective : 08/17/1998

Vice President, Finance, Treasurer

Deck S. Slone
Effective : 04/26/2001

Vice President

Bradley M. Allbritten
Effective : 03/1/2000

Vice President, Marketing

Janet L. Hogan
Effective : 10/16/2000

Assistant Secretary

John W. Lorson
Effective : 04/9/1999

Controller

Charles David Steele
Effective : 06/22/1998

Internal Auditor

Shiela Feldman
Effective : 02/03/2003

Vice President, Human Resources

Canyon Fuel Company, LLC
2002 Annual Report

Yuzo Hirono
Effective: 12/31/1999

Alternates:

Tsutomu Niwa
Effective : 6/01/2001

Yutaka Nakazawa
Effective : 12/20/1996

ITOCHU CORPORATION

9/1/02

| <u>Name</u> | <u>Title</u> | <u>Date of Appointment</u> |
|------------------|--------------------------|----------------------------|
| Minoru Murofushi | Chairman | April 1998 |
| Masahisa Naitoh | Vice Chairman | April 2000 |
| Uichiro Niwa | President, CEO | April 1998 |
| Hiroshi Sumie | Executive Vice President | April 2000 |
| Makoto Kato | Executive Vice President | April 2001 |
| Yushin Okazaki | Executive Vice President | April 2001 |
| Sumitaka Fujita | Executive Vice President | April 2001 |
| Mitsuaki Fukuda | Sr. Managing Director | April 2000 |
| Akira Yokota | Sr. Managing Director | April 2001 |
| Kouhei Watanabe | Managing Director | April 2002 |
| Hiroshi Ueda | Managing Director | April 2002 |
| Motonori Toyota | Managing Director | June 2001 |

ITOCHU COAL INTERNATIONAL INC.

Masayoshi Araya
Effective : Dec. 1999
Chairman of the Board

Yuzo Hirono
Effective: : Dec. 1999
President and Chief Executive Officer

Tsutomu Niwa
Effective : June 1996
Chief Financial Officer

Dietz Fry
Effective : March 1997
Vice President, Finance and Administration

Canyon Fuel Company, LLC
2002 Annual Report

Yutaka Nakazawa
Effective : Dec. 1996

Vice President Commercial and Secretary

Hiroshi Akiba
Effective : Feb. 2000

Assistant Secretary

ITOCHU COAL INTERNATIONAL, INC.

3/17/2003

| Name | | Ending Date |
|-------------------|-------------------------------|--------------------|
| Araya, Masayoshi | Director | Dec 1, 1999 |
| Takahish, Katsumi | Director | Dec 1, 1999 |
| | Alternate to Management Board | June 1, 2001 |

ITOCHU CORP

| Name | | Ending Date |
|--------------------|-----------------|--------------------|
| Katsuyuki Kanozaki | Director | March 31, 1998 |
| Masayoshi Fujiwara | Director | March 31, 1999 |
| Tetsusaburo Shirai | Director | March 31, 2000 |
| Jay W. Chai | Exec. VP | March 31, 2000 |
| Seizo Kano | Sr. Mang. Dir. | March 31, 1999 |
| Nobusiro Takahashi | Sr. Mang. Dir. | March 31, 2000 |
| Motohiro Matsukura | Mang. Director | March 31, 1998 |
| Takeshi Seino | Manag. Director | March 31, 1998 |
| Takeo Onda | Sr. Mang. Dir. | March 31, 1999 |
| Shougo Honma | Sr. Mang. Dir. | March 31, 1999 |
| Keichi Wakabayashi | Sr. Mang. Dir. | March 31, 1998 |
| Masahiro Fukumoto | Manag. Director | March 31, 2001 |
| Shiro Morita | Manag. Director | March 31, 1998 |
| Kakuichi Saegusa | Manag. Director | March 31, 2001 |
| Hiroshi Izuka | Manag. Director | March 31, 1997 |
| Tokuji Kayama | Manag. Director | March 31, 2000 |
| Hirotsuka Takechi | Manag. Director | March 31, 1999 |
| Masaya Takei | Manag. Director | March 31, 2000 |
| Junichi Tanlyama | Manag. Director | March 31, 1999 |
| Takeshi Kondo | Manag. Director | March 31, 1998 |
| Yasuo Itsushima | Manag. Director | March 31, 1999 |
| Kunio Tajiri | Director | March 31, 1999 |

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Canyon Fuel Company, LLC
2002 Annual Report

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Effective : 12/20/1996

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| Makoto Kato | Executive Vice President | April 2001 |
| Yushin Okazaki | Executive Vice President | April 2001 |
| Sumitaka Fujita | Executive Vice President | April 2001 |
| Mitsuaki Fukuda | Sr. Managing Director | April 2000 |
| Akira Yokota | Sr. Managing Director | April 2001 |
| Kouhei Watanabe | Managing Director | April 2002 |
| Hiroshi Ueda | Managing Director | April 2002 |
| Motonori Toyota | Managing Director | June 2001 |

ITOCHU COAL INTERNATIONAL INC.

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Canyon Fuel Company, LLC
2002 Annual Report

Yutaka Nakazawa
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Vice President Commercial and Secretary

Hiroshi Akiba
Effective : Feb. 2000

Assistant Secretary

APPENDIX D

Mine Maps

As required under R645-302-525-270

CONTENTS

APPENDIX E

Other Information

In accordance with the requirements of R645-301 and R645-302

CONTENTS