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GENWAL RESOURCES, INC.

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Incoming
C/015/0032
Task ID #2023

August 27, 2004

Utah Coal Program
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, UT 84114-5801

Re: Response to TA of 08/12/2004 for South Crandall Permit Change, Crandall Cyn Mine, C/015/032

Dear Sirs,

GENWAL Resources, Inc. is submitting the response to the Technical Analysis dated 08/12/2004 of the South Crandall Permit Change Application.

Call me at 435-564-4015 if you have any questions.

Sincerely

Gary E. Gray
Engineer/Agent

File in:
☐ Confidential
☐ Shelf
☒ Expandable
Refer to Record No 0019 Date 08272004
In C0150032 2004 Incoming
For additional information

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AUG 31 2004
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LIST OF APPENDICES (continued)

APPENDIX NUMBER	DESCRIPTION
7-36	Calculations of Stream Channel Density
7-37	Pre- & Post-mining SEDROUT Outputs
7-38	Blind Canyon Channel Erosion & Cumulative Drainage Erosion
7-39	Erosion Calculation Methodology, Blind Canyon Watershed
7-40	Terratek Subsidence Study
7-41	Implication for Self-Healing of Fractures
7-42	Crandall and Blind Canyons Water Quality Data (GENWAL)
7-43	Crandall and Blind Canyons Field Water Quality Measurements (GENWAL)
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7-46	Monitoring Well Lithologic Logs
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7-49	Mitigation For Blind Canyon Creek
7-50	Construction Sequence - 72" Culvert
7-51	Little Bear Spring Water Replacement Agreement
7-52	Supplemental Hydrogeologic Information for LBA 11
7-53	Summary of New Isotopic Information for LBA 11
7-54	Results of In-Mine Slug Tests
7-55	Investigation of Alluvial Ground Water System in Mill Fork Canyon

7-56 Investigation of Potential for Little Bear Spring Recharge

7-57 Determination of Recharge Location of Little Bear Spring (Dye Tracing)

7-58 Summary of Hydro logic Baseline Information, South Crandall Lease

7-59 Little Bear Spring Study (Initial study, 1998) AquaTrack

7-60 Little Bear Spring Study (Expanded Study, 1999) AquaTrack

7-61 Mill Fork Resistivity Study, 2001 AquaTrack

7-62 Little Bear Spring (2nd Expanded Study, 2001) AquaTrack

7-63 Hydrology/Geology Map of Little Bear Watershed

Note: Bold number plates and appendices are included with this submittal.

7.21 General Requirements

This section presents a description of the hydrologic resources within the Crandall Canyon Mine permit area and the proposed South Crandall Lease area.

7.22 Cross Sections and Maps

Figures 7-1 through 7-12 and Plates 7-1 through 7-17 of this chapter depict existing surface and groundwater occurrences within and adjacent to the Crandall Canyon Mine permit area and the proposed South Crandall Lease area. These figures also illustrate the topography, streams, springs, wells, water monitoring locations, and other hydrologic design information pertinent to the Crandall Canyon Mine and the proposed South Crandall Lease area. Refer to 7-63 for a detailed map of the Little Bear Canyon watershed showing mining projection, geology and location of seeps below the Castle Gate sandstone where cover is less than ~~800'~~ 600' above the coal seams.

Plates 7-14 and 7-15 have been updated to show the groundwater and surface water rights within and adjacent to the South Crandall lease area. Plates 7-12 (seep and spring) and 7-16 (stream monitoring) have also been updated relative to the South Crandall lease area. Note that Plate 7-13 has been deleted from the MRP.

7.2 Sampling and Analysis

All water samples are collected and analyzed according to methods in either the "Standard Methods for the Examination of Water and Waste Water" or the 40 CFR parts 136 and 434.

7.24 Baseline Information

(It should be noted that the Dellenbach fee tract is included in the currently approved permit area. All current data for hydrologic, geologic, and climatologic information applies to the Dellenbach tract.) Baseline hydrologic information for the proposed South Crandall Lease area is summarized in Appendix 7-58.

7.24.1 Groundwater Information

This section is a comprehensive view of the groundwater hydrology for the Crandall Canyon Mine permit and surrounding area and the proposed the South Crandall Lease area.

Scope

This section presents discussions of groundwater conditions within and adjacent to the permit area, which consists of lease areas SL 062648 and U 054762, State leases ML21568 and ML21569, UTU-68082 and the proposed South Crandall Lease area, UTU-78953 (Plate 7-12). Conclusions drawn herein are based upon detailed seep and spring surveys of the area, limited exploratory drilling, results of stream monitoring, and the results of groundwater investigations conducted by others in the region of the mine.

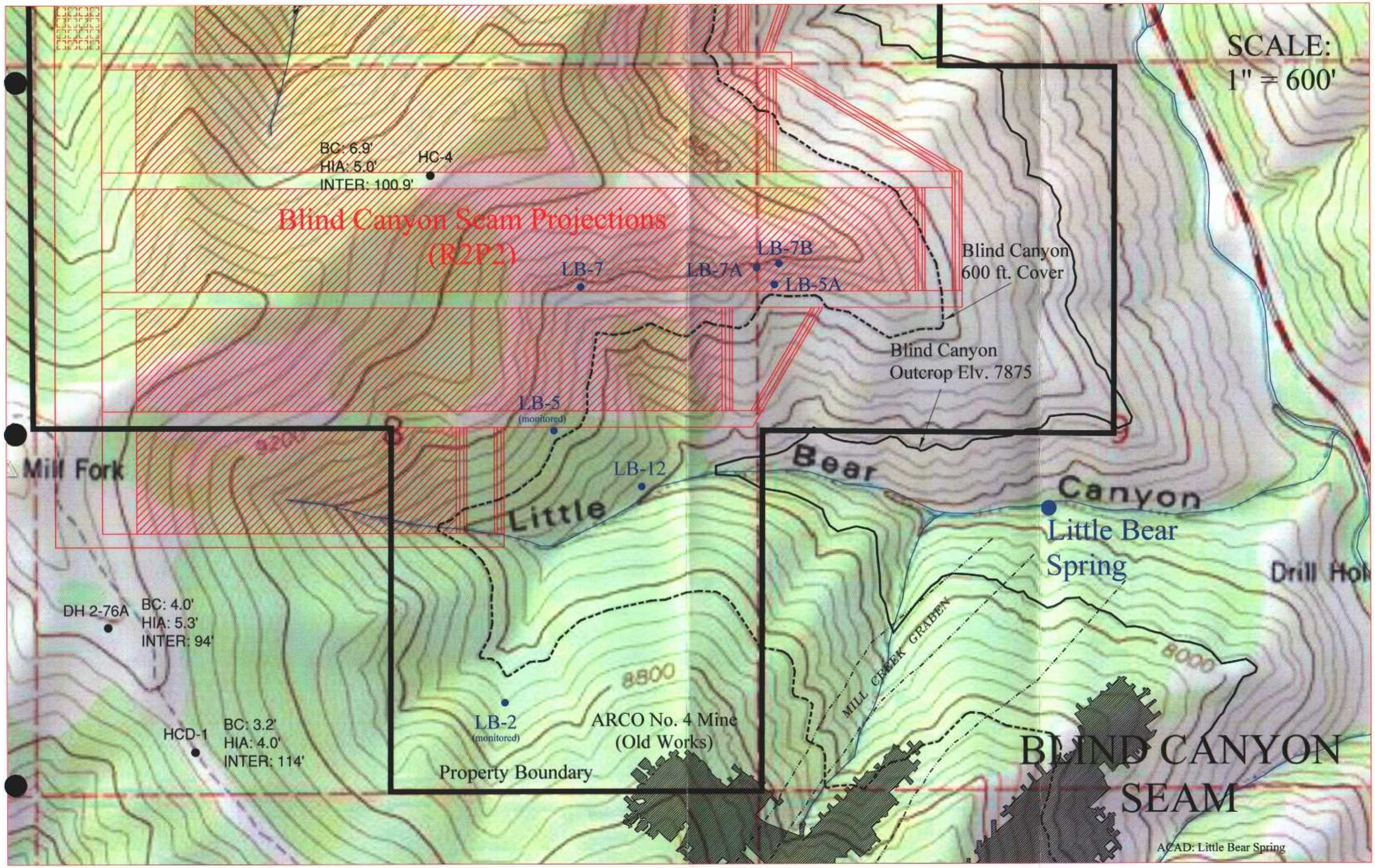
APPENDIX 7-63

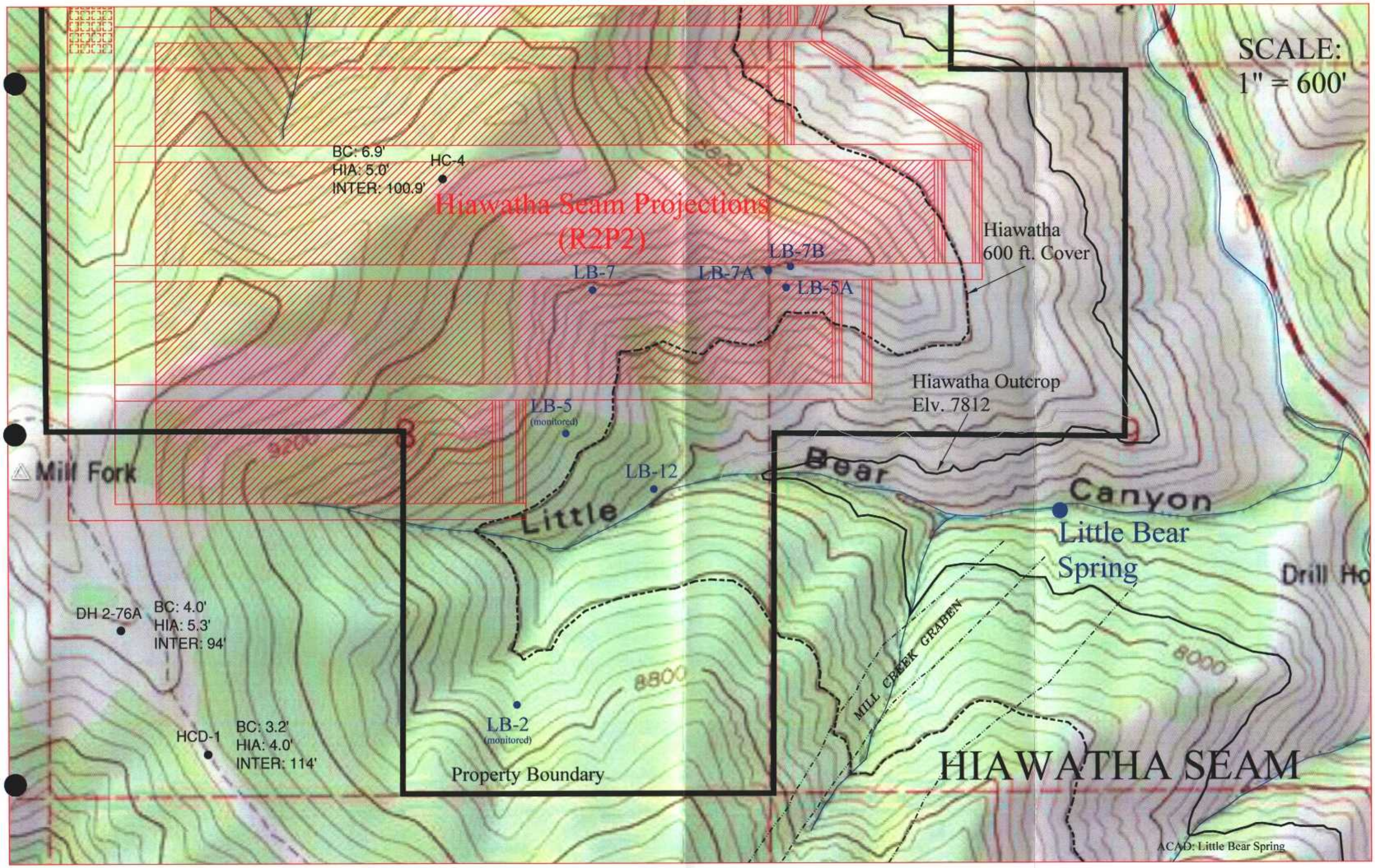
HYDROLOGY/ GEOLOGY MAP
OF
LITTLE BEAR WATERSHED

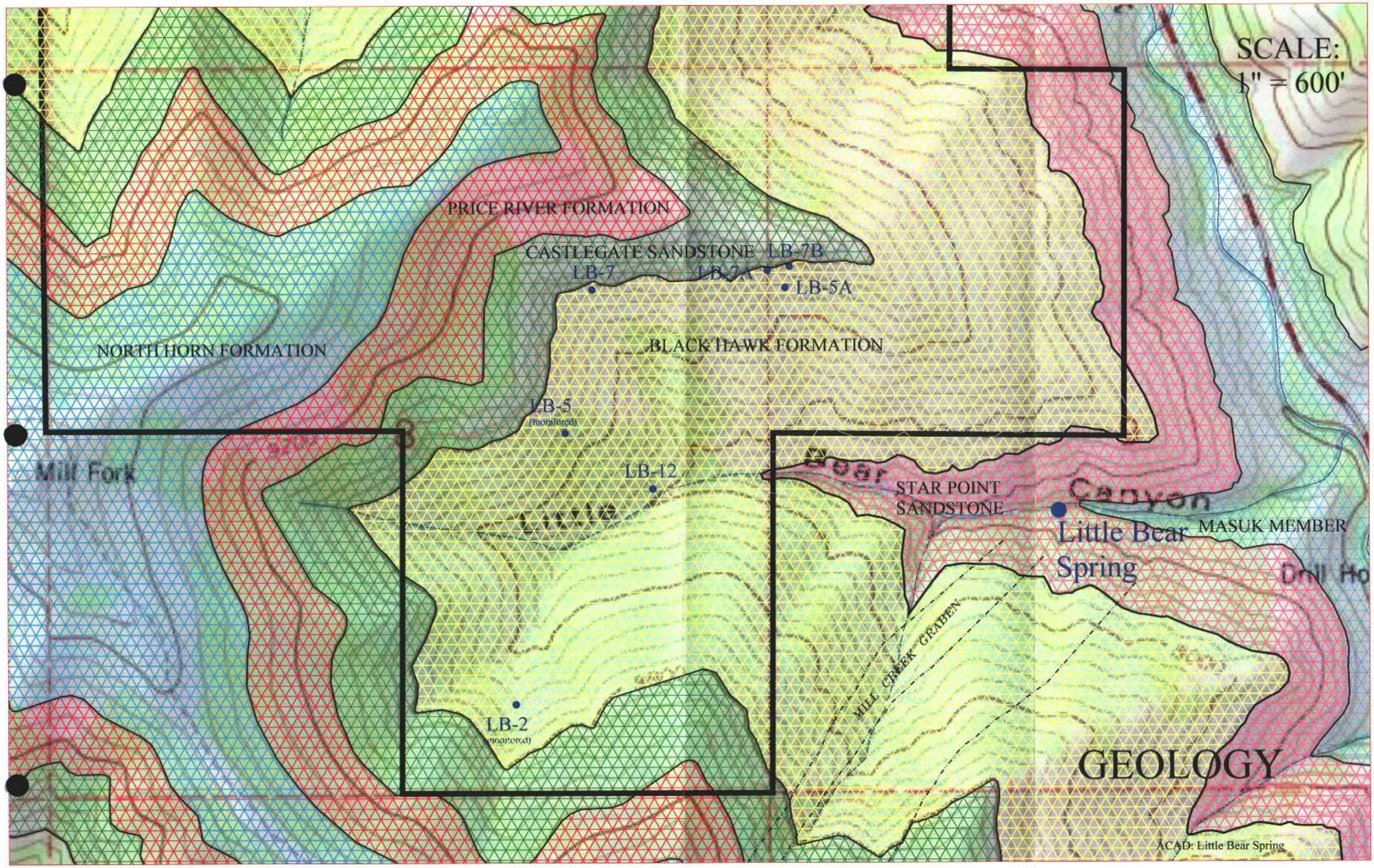
Springs and seeps identified in the southern portion of the South Crandall lease area near or below the 600-foot cover line, 14 July 2004

Petersen Hydrologic, Survey July 2004.xls 27 Aug 04

	UTM coordinates NAD 27, Zone 12 S		Date	Flow (gpm)	T (°C)	pH S.U.	Cond (µS)	Comments
LB-2	486397	4365567	15-Jun-04	13.3	7.4	8.39	451	Spring flow originates from Blackhawk Formation above this location (monitored at bedrock-high below main spring area)
LB-12	486712	4365961	14-Jul-04	damp ground	---	---	---	Damp ground only, not enough flow to measure field parameters
LB-5	486510	4366085	14-Jul-04	1.8	8.4	7.80	706	Discharges from base of Blackhawk Formation sandstone channel (not in potentially subsided area)
LB-7	486573	4366403	14-Jul-04	1.1	8.5	7.99	501	Seepage from base of Castlegate Sandstone/muddy landslide deposits in channel bottom
LB-7A	486969	4366426	14-Jul-04	seep/drip	---	---	---	Seepage from base of Castlegate Sandstone cliff, not enough flow to measure field parameters
LB-7B	487003	4366446	14-Jul-04	seep/drip	---	---	---	Seepage from base of Castlegate Sandstone cliff, not enough flow to measure field parameters
LB-5A	486998	4366398	14-Jul-04	0.21	11.4	8.44	424	Discharges from colluvial sediments at the base of Castlegate Sandstone


SCALE:
1" = 600'
BC: 6.9'
HIA: 5.0'
INTER: 100.9'
HC-4
Blind Canyon Seam Projections
(R2P2)
LB-7
LB-7A
LB-7B
LB-5A
Blind Canyon
600 ft. Cover
Blind Canyon
Outcrop Elv. 7875
LB-5
(monitored)
Mill Fork
LB-12
Little
Bear
Canyon
Little Bear
Spring
Drill Hol
DH 2-76A
BC: 4.0'
HIA: 5.3'
INTER: 94'
8000
8500
MILL CREEK GRABEN
HCD-1
BC: 3.2'
HIA: 4.0'
INTER: 114'
LB-2
(monitored)
ARCO No. 4 Mine
(Old Works)
Property Boundary
BLIND CANYON
SEAM
ACAD: Little Bear Spring


SCALE:
1" = 600'
BC: 6.9'
HIA: 5.0'
INTER: 100.9'
HC-4
Hiawatha Seam Projections
(R2P2)
LB-7B
LB-7
LB-7A
LB-5A
Hiawatha
600 ft. Cover
Hiawatha Outcrop
Elv. 7812
LB-5
(monitored)
LB-12
Mill Fork
Little
Bear
Canyon
Little Bear
Spring
Drill Ho
DH 2-76A
BC: 4.0'
HIA: 5.3'
INTER: 94'
MILL CREEK GRABEN
8000
8800
HCD-1
BC: 3.2'
HIA: 4.0'
INTER: 114'
LB-2
(monitored)
Property Boundary
HIAWATHA SEAM
ACAD: Little Bear Spring


SCALE:
1" = 600'
PRICE RIVER FORMATION
CASTLEGATE SANDSTONE
LB-7B
LB-7
LB-7A
LB-5A
NORTH HORN FORMATION
BLACK HAWK FORMATION
LB-5
(monitored)
LB-12
Mill Fork
Bear
Canyon
STAR POINT
SANDSTONE
Little Bear
Spring
MASUK MEMBER
MILL CREEK GRABEN
LB-2
(monitored)
GEOLOGY
ACAD: Little Bear Spring