WEST RIDGE MINE

007/041

CHANGE TO THE MINING AND
RECLAMATION PLAN
(273.43 ACRES)

EXTRACTION OF LONGWALL PANEL #22

RESPONSE TO DEFICIENCIES
TASK #3894

NOTE TO REVIEWERS:

1) UNDER THIS APPLICATION THERE WILL BE NO LONGWALL MINING UNDER THE RIGHT FORK OF WHITMORE CANYON

SUBMITTED: DECEMBER , 2011
(INITIAL SUBMITTAL: AUGUST 8, 2011)

COVER LETTER.....CI/C2 FORMS

C/007/041 Incoming

#3989 R

WEST RIDGE
RESOURCES, INC.

P.O. Box 910, East Carbon, Utah 84520
Telephone (435) 888-4000 Fax (435) 888-4002

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

December 15, 2011

File in:
☐ Confidential
☒ Shelf
☐ Expandable
Date Folder 12511 C/007041
Incoming refer to Confidential

Attn: Dana Dean
Associate Director

Re: West Ridge Mine C/007/041
Change to Allow Extraction of Longwall Panel 22
Response to Deficiencies, Task 3894

Dear Ms. Dean:

Enclosed are six clean copies of the response to deficiencies for the longwall panel #22 amendment to the West Ridge MRP, Task #3894

As you review this response please note the following:

1) **There will be no longwall mining under (beneath) the Right Fork of Whitmore Canyon**. The only mining under the Right Fork will be the development entries associated with the longwall bleeder system.

2) The company has already conducted similar development mining under the Right Fork in this area based on prior permitting approval from the Division associated with longwall panel #20. Two sets of gate entries have been mined below the Right Fork, as shown on the map in Appendix 7-16 submitted as part of this amendment.

3) In approving the development mining for panels #20 and #21 (referred to in item 2), the Division, in its official findings of March 23, 2011, made the following conclusions:

> *"The application meets the baseline information requirements of the State of Utah R645-Coal Mining Rules."*
>
> *"The potential impacts to surface water resources are minimal as well. No planned subsidence will occur on the Right Fork of Whitmore Canyon. Development mining only will occur below the Right Fork drainage. The amount of overburden in the area of the Right Fork of Whitmore Canyon ranges from*

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2,500-3,000' below grade. As a result of this extensive cover, the potential for impacts to this drainage are considered minimal."

"This application meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules."

4) In the deficiencies of Task 3894, there are several references to the "June 23rd, 2011 stakeholder meeting". It should be emphasized and clearly understood that this meeting involved an entirely different proposal, in which the company was proposing to construct a new replacement reservoir for the Grassy Trail reservoir, and to mine numerous longwall panels underneath and beyond the existing reservoir, and underneath and beyond the drainage of the Right Fork. Due to unforeseen geologic conditions encountered after the June 23rd meeting the company was forced to officially abandon that proposal and withdraw all pending permitting actions with the numerous state and local agencies involved at the time. The existing proposal (addressed in Task 3894), as explained previously, is a totally new and different proposal, involving neither the relocation of the reservoir nor any longwall mining under or beyond the Right Fork, nor any kind of mining not already approved by the Division. Therefore it is inappropriate for the Division to officially link the discussions of the June 23rd stakeholder meeting to the present pending permit amendment action. This point is made not as a complaint, but as a matter of clarification.

5) Finally, please keep in mind that all mining associated with panel #22 will be conducted at depths ranging from 2700' to 3800' below the surface. This would be the deepest longwall panel in America. Please consider this fact when evaluating the potential for any possible affects to the surface.

Due to the critical timing associated with these development entries we request an expedited review of this application. If you have questions or comments please contact me at (435) 888-4017.

Sincerely,

David Shaver
Resident Agent

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APPLICATION FOR PERMIT PROCESSING

Permit Change ☐	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: C/007/041

Type of Proposal: Change to allow extraction of Longwall Panel #22

Response to Deficiencies, Task 3894

Mine: WEST RIDGE MINE

Permittee: **WEST RIDGE Resources, Inc.**

Description, include reason for application and timing required to implement:.

Instructions: *If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation specialist.*

☒ Yes	☐ No	1. Change in the size of the Permit Area? 273.43 acres Disturbed Area? no acres ☐ increase ☒ decrease.
☐ Yes	☒ No	2. Is the application submitted as a result of a Division Order?
☐ Yes	☒ No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	☒ No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	☒ No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	☒ No	6. Does the application require or include public notice/publication?
☒ Yes	☐ No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	☒ No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes	☒ No	9. Is the application submitted as a result of a Violation?
☐ Yes	☒ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain:
☐ Yes	☒ No	11. Does the application affect the surface landowner or change the post mining land use?
☒ Yes	☐ No	12. Does the application require or include underground design or mine sequence and timing?
☒ Yes	☐ No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	☒ No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes	☒ No	15. Does application require or include soil removal, storage or placement?
☐ Yes	☒ No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes	☒ No	17. Does the application require or include construction, modification, or removal of surface facilities?
☒ Yes	☐ No	18. Does the application require or include water monitoring, sediment or drainage control measures?
☒ Yes	☐ No	19. Does the application require or include certified designs, maps, or calculations?
☒ Yes	☐ No	20. Does the application require or include subsidence control or monitoring?
☐ Yes	☒ No	21. Have reclamation costs for bonding been provided for?
☐ Yes	☒ No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	☒ No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

☐ **Attach _3_ complete copies of the application.**

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein. (R645-301-123)

Signed - Name - Position - Date 12/7/2011 agent

Subscribed and sworn to before me this 7th day of December, 2011

Notary Public

My Commission Expires: 3.27.13

Attest: STATE OF Utah

COUNTY OF Carbon

LINDA KERNS
NOTARY PUBLIC • STATE of UTAH
COMMISSION # 578211
COMM. EXP. 03-27-2013

Received by Oil, Gas & Mining

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DEC 15 2011

DIV. OF OIL, GAS & MINING

ASSIGNED TRACKING NUMBER

Application **for Permit Processing**
Detailed Schedule of Changes to the MRP

Title of Application:
Change to allow extraction of Longwall Panel #22

Response to Deficiencies, Task 3894

Page 1 of 2

Permit Number: C/007/041

Mine: WEST RIDGE MINE

Permittee: WEST RIDGE RESOURCES

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. Include page, section and drawing numbers as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☒ REPLACE	☐ REMOVE	Chapter 1 replacement pages (changes shown in red)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☒ REPLACE	☐ REMOVE	Appendix 1-4B(a) Federal Coal Lease UTU-78562 Modification
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☒ REPLACE	☐ REMOVE	Chapter 5 replacement pages (changes shown in red)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☒ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-3E BLM 12P2 approval Panel 22
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☒ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-18 Subsidence monitoring Right Fork Whitmore Canyon
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☒ REPLACE	☐ REMOVE	Chapter 7 text (changes shown in red and yellow)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-6B 2011 Spring + Seep Survey
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-14 Historical Flow Data Right and Left Fork Whitmore Canyon
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

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Application for Permit Processing
Detailed Schedule of Changes to the MRP

Title of Application:
Change to allow extraction of Longwall Panel #22

Response to Deficiencies, Task 3894

page 2 of 2

Permit Number: C/007/041

Mine: WEST RIDGE MINE

Permittee: WEST RIDGE RESOURCES

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. Include page, section and drawing numbers as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	— continued —
☐ ADD	☐ REPLACE	☐ REMOVE	
☒ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-15 Gain-Loss Analysis
☐ ADD	☐ REPLACE	☐ REMOVE	Right Fork, Whitmore Canyon
☐ ADD	☐ REPLACE	☐ REMOVE	
☒ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-16 Underground
☐ ADD	☐ REPLACE	☐ REMOVE	Flow meters
☐ ADD	☐ REPLACE	☐ REMOVE	
☒ ADD	☐ REPLACE	☐ REMOVE	Confidential Information (Binder)
☐ ADD	☐ REPLACE	☐ REMOVE	Raptor Survey 2011
☐ ADD	☐ REPLACE	☐ REMOVE	Archeological Data
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	Maps: 1-0/1-1, 2-1, 3-1, 3-4A,
☐ ADD	☐ REPLACE	☐ REMOVE	3-4B, 3-4C, 3-4D, 4-1, 4-2
☐ ADD	☐ REPLACE	☐ REMOVE	5-2, 5-3, 5-4A, 5-4B, 5-7
☐ ADD	☐ REPLACE	☐ REMOVE	6-1, 6-2, 6-3, 7-3, 7-5, 7-6
☐ ADD	☐ REPLACE	☐ REMOVE	7-7, 7-8
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-17 Div Wtr Rights Correspondence
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

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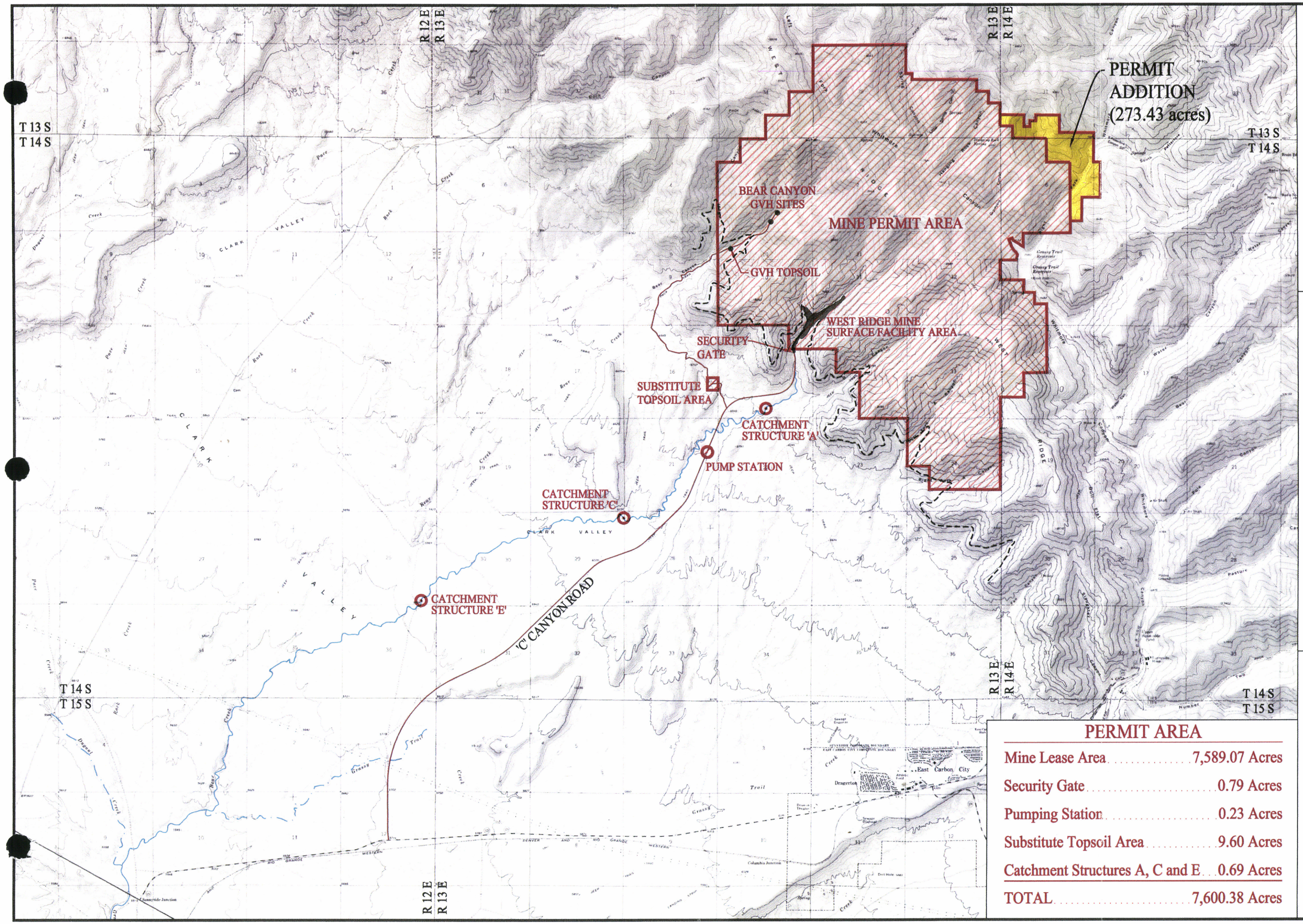
DIV. OF OIL, GAS & MINING



PERMIT AREA

Mine Lease Area	7,589.07 Acres
Security Gate	0.79 Acres
Pumping Station	0.23 Acres
Substitute Topsoil Area	9.60 Acres
Catchment Structures A, C and E	0.69 Acres
TOTAL	7,600.38 Acres

WEST RIDGE RESOURCES, INC.

SCALE: 1"=5000'

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs 7/6/11 PROFESSIONAL ENGINEER

LEGEND:
- Lease Areas
- Surface Facility Area
- GVH Site
- Outcrop

WEST RIDGE MINE
Map 1-0, Permit Map
Map 1-1, Location Map

DATE: 7-06-11 REV: 15 ACAD REF: Maps 1-0 and 1-1 Rev 15 with Hilite

EXISTING D.O.G.M.
PERMIT AREA
(7,589.07 ACRES)

PROPOSED
PERMIT AREA
(273.43 acres)

PANEL #1
PANEL #2
PANEL #3
PANEL #4
PANEL #5
PANEL #5A
PANEL #6
PANEL #7
PANEL #8
PANEL #9
PANEL #10
PANEL #11
PANEL #12
PANEL #13
PANEL #14
PANEL #15
PANEL #16
PANEL #17
PANEL #18
PANEL #19
PANEL #20
PANEL #21
PANEL #22
PANEL #23
BARRIER

L. F. Bear Canyon
R. F. Bear Canyon
B. Canyon
C. Canyon
CARBON COUNTY "C" CANYON ROAD
OUTCROP
Grassy Trail Reservoir
Whitmore

1000 0 2000 4000 FEET
SCALE: 1" = 2000'

N

KEY

EXISTING LONGWALL PANELS

PROPOSED LONGWALL PANELS

MINING PLAN
PROPOSED PERMIT AREA

WEST RIDGE RESOURCES, INC.

794 NORTH "C" CANYON ROAD
EAST CARBON, UTAH 84520

MSHA MINE ID # 42-02233

DRAWN BY	PJ	SCALE	1" = 2000'
APPROVED BY	DS	DATE	13 JULY 2011

G:\Current Drawings\Maps\West Ridge Mine\Whitmore Canyon\Presentation\IBC Presentation 7-13-11.dwg, Permit Area, 11/7/2011 9:13 AM

CHAPTER ONE.....REPLACEMENT PAGES

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

TABLE OF CONTENTS- CHAPTER 1
R645-301-100 PERMIT APPLICATION REQUIREMENTS: GENERAL CONTENTS

REGULATION NUMBER	CONTENTS	PAGE NUMBER
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R645-301-114	Right of Entry Information	5
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	Table 1-5 Legal Description of Permit Area, Total Area	14
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R645-301-100 CHAPTER 1

APPENDIX NUMBER	DESCRIPTION
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	Attachment 1-1 Certificate of Liability Insurance
	Attachment 1-2 Newspaper Advertisement
	Attachment 1-3 Proof of Publication
	Attachment 1-4 Filing Fee Verification
	Attachment 1-5 Verification Statement
APPENDIX 1-2	Violation Information
APPENDIX 1-3	Reference List
APPENDIX 1-4	Proof of Lease Assignment
APPENDIX 1-4A	Federal Lease SL-068754, U-01215
APPENDIX 1-4B	Federal Lease UTU-78562
APPENDIX 1-4B(a)	Federal Lease UTU-78562 Modification
APPENDIX 1-4C	State Lease ML-47711
APPENDIX 1-4D	State Lease ML-49287
APPENDIX 1-4E	State Lease ML-51744
APPENDIX 1-4F:	Penta Creek Fee Lease, which includes
APPENDIX 1-4F(a)	Original Fee Lease
APPENDIX 1-4F(b)	Lease Extension #1, August 24, 2010
APPENDIX 1-4F(c)	Lease Extension #2, March 10, 2011
APPENDIX 1-4G:	Hinkins Fee Lease, which includes:
APPENDIX 1-4G(a)	David P. Hinkins 50%
APPENDIX 1-4G(b)	Emily P. Marston 25%
APPENDIX 1-4G(c)	Leonard J. Pagano 25%
APPENDIX 1-5	Current and Previous Coal Mining Permits
APPENDIX 1-6	Consultation and Coordination
APPENDIX 1-7	Ownership and Control
APPENDIX 1-8	Letter from Carbon County
APPENDIX 1-9	*******Deleted******
APPENDIX 1-10	SITLA - Special Use Lease (Topsoil Borrow Area)

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(continued)

APPENDIX 1-11	Material Deposit Special Use Lease Agreement
APPENDIX 1-12	Waterline/Pump House Right of Way
APPENDIX 1-13	Correspondence Regarding Security Gate
APPENDIX 1-14	********Moved********
APPENDIX 1-15	Legal Description of Grassy Trail Reservoir

TABLE OF CONTENTS- MAP LIST
R645-301-100 CHAPTER 1

MAP NUMBER	DESCRIPTION	SCALE
MAP 1-0	**Permit Map**	**1" = 2000'**
MAP 1-1	Location Map	1" = 2000'

R645-301-100 PERMIT APPLICATION REQUIREMENTS: GENERAL CONTENTS

SCOPE

The objective of this chapter is to set forth all relevant information concerning ownership and control of WEST RIDGE Resources, Inc., the ownership and control of the property to be affected by mining activities and all other information and documentation required under Part UMC.

R645-301-112 IDENTIFICATION OF INTERESTS

112.100 WEST RIDGE Resources, Inc. is a corporation organized and existing under the laws of Utah and qualified to do business in Utah.

112.200 The applicant, WEST RIDGE Resources, Inc. will also be the operator.

WEST RIDGE Resources, Inc.
P.O. Box 910
East Carbon, Utah 84520
(435) 888-4000
David Hibbs - President

Employer Identification Number: 87-0585129

112.220 The resident agent of the applicant, WEST RIDGE Resources, Inc., is:

Dave Shaver
WEST RIDGE Resources, Inc.
P.0. Box 910
East Carbon, Utah 84520

(435) 888-4000

112.230 WEST RIDGE Resources, Inc. will pay the abandoned mine land reclamation fee.

112.300 **Ownership and Control** - See Appendix 1-7

WEST RIDGE Resources, Inc. is the permittee and operator of the WEST RIDGE Mine. WEST RIDGE Resources, Inc. is a wholly owned subsidiary of ANDALEX Resources, Inc.. WEST RIDGE Resources, Inc. is a Utah corporation licensed to do business in the State of Utah. All leases associated with the WEST RIDGE Mine are owned by ANDALEX Resources, Inc. ANDALEX Resources, Inc, is a wholly owned subsidiary of UtahAmerican Energy Inc., which in turn is a wholly owned subsidiary of Murray Energy Corporation.

112.340 See Appendix 1-5

112.350 See Appendix 1-5

112.410 See Appendix 1-5

112.420 See Appendix 1-7

112.500 Surface Owners:

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Glen Wells
700 West U.S. Hwy 6
Price, Utah 84501

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

David Hinkins
155 West 100 South
Orangeville, Utah 84537

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

Matt Rauhala
1236 East Main
Price, Utah 84501

Subsurface Owners:

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

WEST RIDGE Resources, Inc. is the holder of record for federal lease SL-068754 and UTU 78562 (see Table 1-1), state lease ML 47711 and ML 49287 (see Table 1-2A) and the Penta Creek Fee lease (see Table 1-2B).

Proof of lease assignment for all leases (Federal leases SL-068754 and UTU 78562, and State leases ML 47711 and ML 49287), and the Penta Creek fee lease can be found in Appendix 1-4.

112.600 Contiguous surface owners:

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Dave Hinkins
155 West 100 South
Orangeville, Utah 84537

Glen Wells
700 West U.S. Hwy 6
Price, Utah 84501

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

Contiguous subsurface owners:

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

David Hinkins
155 West 100 South
Orangeville, Utah 84537

Emily P Marston
843 Genodle Drive
Midvale, Utah 84047

Leonard J. Pagano
55 West main Street
Price, Utah 84501

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

112.700 See Appendix 1-5

112.800 There are no pending interests or bids existing on lands contiguous to the present leased area.

112.900 After WEST RIDGE Resources, Inc. is notified that the application is approved, but before the permit is issued, WEST RIDGE Resources, Inc. will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-112.100 through R645-301-112.800.

R645-301-113 VIOLATION INFORMATION

113.100 The applicant or any subsidiary, affiliate or persons controlled by or under common control with the applicant has not had a federal or state permit to conduct coal mining and reclamation operations suspended or revoked in the five years preceding the date of submission of the application.

113.120 The applicant etc. has not forfeited any performance bond or similar security

113.200 Not applicable

113.300 A listing of violations received by the applicant in connection with any coal mining and reclamation operation during the three year period preceding the application date is provided in Appendix 1-2. MSHA numbers for the operations can be found in Appendix 1-5. There have been no unabated violations or cessation orders issued to any affiliated companies during the previous three years.

113.400 After WEST RIDGE Resources, Inc. is notified that the application is approved, but before the permit is issued, WEST RIDGE Resources, Inc. will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-113.

R645-301-114 RIGHT OF ENTRY INFORMATION

114.100 WEST RIDGE Resources, Inc., currently holds 5256.16 acres of federal coal (2,650.67 acres leased under SL-068754 and 2605.49 acres leased under UTU 78562) in the Book Cliffs coal field (refer to Maps 1-0 and 5-3). A complete legal description of all Federal leases held by WEST RIDGE is found in Table 1-1. WEST RIDGE currently holds 2162.34 acres of state coal (801.24 acres under ML 47711, 881.10 under ML 49287, and 480 acres under ML 51744. A complete legal description of all State leases held by WEST RIDGE is found in Table 1-2. WEST RIDGE also holds 1189.84 acres leased on contiguous private (fee) coal lands located along the eastern side of the mineable reserve. A complete legal description of this fee lease is found in Table 1-3. None of these leases are the subject of any pending litigation. Proof of lease assignment for all leases can be found in Appendix 1-4.

WEST RIDGE Resources, Inc. bases its legal right to enter and conduct mining activities in the permit area pursuant to the language contained in the Federal Coal Lease, Part I Lease Rights Granted which reads as follows:

"That the lessor, in consideration of the rents and royalties to be paid and the covenants to be observed as hereinafter set forth, does hereby grant and lease to the lessee the exclusive right and privilege to mine and dispose of all the coal in, upon, or under the following described tracts of land, situated in the State of Utah... together with the right to construct all such works, buildings, plants, structures and appliances as may be necessary and convenient for the mining and preparation of the coal for market, the manufacture of coke or other products of coal, the housing and welfare of employees, and subject to the conditions herein provided, to use so much of the surface as may reasonably be required in the exercise of the rights and privileges herein granted."

In addition to the coal leases, WEST RIDGE also holds several surface use permits as part of the operation, including:

1) SITLA Special Use Lease Agreement No. 1163. The substitute topsoil borrow area, which is also included within the permit area, is located on lands administered by the Utah School and Institutional Trust Lands Administration (SITLA). This area is located within the SE1/4 of section 16, T 14 S, R 13 E. SITLA has issued a long term special use permit to WEST RIDGE Resources, Inc. which provides full assurance that the topsoil resource in this area will be available for (and, indeed dedicated to) final reclamation of the West Ridge minesite if needed. This area is not contiguous with the main coal leasehold. (See Appendix 1-10 for details)

2) BLM Right-of-Way UTU-77120 This right-of-way authorizes the installation and operation of a pumping station used to facilitate the delivery of culinary water to the West Ridge Mine. This area is not contiguous with the main coal leasehold. (See

Appendix 1-12 for details)

3) BLM Right-of-Way 87110 This right-of way authorizes the installation of three (3 ea.) catchment structures in the C Canyon drainage below the mine. These catchments are designed to provide containment of unanticipated coal-fines accumulations from the mine discharge water. These catchment structures comprises a total of 0.69 acres (Refer to Appendix 5-15 for details).

The total permit area is 7,600.38 acres. Refer to Map 1-1 for the permit area location. Refer to Table 1-4 for the legal description of the permit area by composite leasehold, and Table1-5 for the legal description of the permit area in total area. Table 1-6 describes the surface ownership of the permit area.

The permit area consists of the following areas:

1) all of federal coal leases SL-068754-U-01215 (2,650.67 acres)
2) most of federal coal lease UTU 78562 (2,403.07 acres),
3) all of state coal leases ML-47711 (801.24 acres)
4) all of state coal lease ML-49287 (881.10 acres)
5) much of state coal lease ML-51744 (212.5 acres)
6) much of the Penta Creek fee coal lease (650.49 acres)
7) SITLA surface lease 1163, for topsoil borrow area (9.6 acres).
8) BLM right-of-way UTU-77120, for pumping station (0.23 acres)
9) BLM right-of-way UTU-87110, for catchment structures A, C and E (0.69 acres)
10) Carbon County authorization, road security gate (0.79 acres). See Appendix 1-13

Disturbed area within the permit area consists of the following:

1)	Minesite surface facilities	29.82 acres
2)	Pumping station	0.23 acres
3)	GVH installation (main pad)	0.24 acres
4)	GVH installation (GVH 5 "pullout")	0.02 acres
5)	GVH topsoil storage	0.1 acres
6)	Catchment structures A	0.12 acres
7)	Catchment structures C	0.23 acres
8)	Catchment structures E	0.23 acres
	TOTAL	30.99 acres

See Table 1-7 for complete legal description of disturbed areas.

114.200 Not applicable, the fee lease mineral estate is not severed from the surface estate.

TABLE 1-1
FEDERAL LEASE and R.O.W. PROPERTIES

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) FEDERAL COAL LEASE SL-068754 (SL-068754-U-01215)	2,650.67	T 14 S, R 13 E	
		Section 10:	NE, E2NW, N2SE, SESE
		Section 11:	All
		Section 12:	S2SW, NWSW
		Section 13:	S2, NW, S2NE, NWNE
		Section 14:	E2, N2NW, SENW
		Section 15:	NENE
		Section 24:	N2, N2SE, NESW
2) FEDERAL COAL LEASE UTU-78562	2,249.25	T 13 S, R13 E	
		Section 34:	NESE, S2SE
		Section 35:	All
		T 13 S, R 14 E	
		Section 31:	Lot 4, S2SESW, NESESW, SENWSESW, W2SWSE, S2SESWSE, S2S2SESE
		T 14 S, R 13 E	
		Section 1:	All
		Section 12:	Lots 1 thru 4, S2N2, NESW, SE
		Section 13:	NENE
		T 14 S, R 14 E	
		Section 5:	Lot 4, W2W2SWNW, SWNWSW, W2NWNWSW, W2SWSW
		Section 6:	Lot 6, NESW, NESE
		Section 7:	Lots 3 and 4

		Section 8:	W2NWNW, W2SENWNW, SWNENWNW, W2SWNW, W2E2SWNW, W2NWSW, SWSW
		Section 17:	N2NWNWNE
		Section 18:	Lot 1, E2NW
3) PUMPING STATION (BLM R.O.W. UTU-7712)	0.23	T 14 S, R 13 E	
		Section 21:	NENE (0.23 acres thereof)
4) CATCHMENT STRUCTURE A (BLM R.O.W. UTU-87110)	0.23	T 14 S, R 13 E	
		Section 15:	SESW (0.23 acres therein)
5) CATCHMENT STRUCTURE C (BLM R.O.W . UTU-87110)	0.23	T 14 S, R 13 E	
		Section 28:	NWNW (0.23 acres therein)
6) CATCHMENT STRUCTURE E (BLM R.O.W . UTU-87110)	0.23	T 14 S, R 12 E	
		Section 25:	SESE (0.23 acres therein)
TOTAL FEDERAL	**5257.08 acres**		

TABLE 1-2
STATE (SITLA) LEASE and SPECIAL USE PROPERTIES

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) STATE LEASE ML 47711	801.24	T 14 S, R 13 E	
		Section 2:	Lots 1 thru 4, S2N2, S2 (i.e. All)
		T 13 S, R 13 E	
		Section 36:	SW
2) STATE COAL LEASE ML 49287	881.10	T 14 S, R 13 E	
		Section 3:	Lots 1, 2, 3, S2N2, S2
		Section 10:	W2NW, SW, SWSE
3) STATE COAL LEASE ML 51744	480	T 13 S, R 13 E	
		Section 36:	N2, SE
4) STATE SURFACE LEASE SPECIAL USE PERMIT (Agreement #1163)	9.6	T 14 S, R 13	
		Section. 16:	E2NESE (9.6 acres thereof, containing substitute topsil area)
TOTAL STATE	**2171.94**		

TABLE 1-3
FEE LEASE PROPERTIES
(PENTA CREEK)

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) PENTA CREEK FEE LEASE	382.08	T 14 S, R 14 E	
		Section 6:	Lot 7, SESW
		Section 7*:	Lots 1* and 2*, NENW*, E2SW*, SWSE
		Section 18:	Lots 2 and 3, NWNE

*Less and excepting from the portion of the above legal subdivisions in Section 7, those lands under and around Grassy Trail Dam and Reservoir owned by East Carbon City and Sunnyside City, such lands being more accurately described in Appendix 1-15.

2) PENTA CREEK LEASE EXTENSION (Extension 1, August, 2010)	352.36	T 14 S, R 14 E	
		Section 6:	Lots 2, 3, 4 and 5, SENW, SWNE, NWSE, S2SE
3) PENTA CREEK LEASE EXTENSION (Extension 2, March, 2011)	295.40	T 14 S, R 14 E	
		Section 6:	Lot 1, SENE
		Section 7:	SWNE, NWSE, SESE, SENW
		Section 18:	NENE
4) HINKINS FEE LEASE**	160.00	T 14 S, R 14 E	
		Section 7:	N2NE, SENE, NESE
TOTAL FEE LEASES:	**1189.84**		

** This lease area is held as follows: (individually)

David P. Hinkins, Todd S. Hinkins and Ross D. Hinkins.....50%
Emily P. Marston.....25%
Leonard Pagano.....25%

TABLE 1-4
LEGAL DESCRIPTION OF PERMIT AREA
(BY LEASEHOLD)

PARCEL	ACREAGE	LEGAL DESCRIPTION
1) FEDERAL LEASE SL-068754 (SL-068754-U-01215)	2,650.67	T 14 S, R 13 E
		Section 10: NE, E2NW, N2SE, SESE
		Section 11: All
		Section 12: S2SW, NWSW
		Section 13: S2, NW, S2NE, NWNE
		Section 14: E2, N2NW, SENW
		Section 15: NENE
		Section 24: N2, N2SE, NESW
2) FEDERAL LEASE UTU-78562	2403.07	T 13 S, R13 E
		Section 34: NESE, S2SE
		Section 35: All
		T 13 S, R 14 E
		Section 31: Lot 4, S2SESW, NESESW, SENWSESW, W2SWSE, S2SESWSE, S2S2SESE
		T 14 S, R 13 E
		Section 1: All
		Section 12: Lots 1 thru 4, S2N2, NESW, SE
		Section 13: NENE
		T 14 S, R 14 E
		Section 5: W2W2SWNW, W2NWNWSW
		Section 6: Lot 6, NESW, N2NESE, SWNESE
		Section 7: Lots 3 and 4
		Section 18: Lot 1, E2NW

TABLE 1-4 (continued)

3) STATE LEASE ML 47711	801.24	T 14 S, R 13 E	
		Section 2:	Lots 1 thru 4, S2N2, S2
		T 13 S, R 13 E	
		Section 36:	SW
4) STATE LEASE ML 49287	881.10	T 14 S, R 13 E	
		Section 3:	Lots 1, 2 and 3, S2N2, S2
		Section 10:	W2NW, SW, SWSE
5) STATE LEASE ML 51744	212.5	T 13 S, R 13 E	
		Section 36:	SW, SWNWSWNW, S2S2NW, S2SWNE, W2SE, SESE, S2NESE, NWNESE
6) PENTA CREEK FEE LEASE	238.17	T 14 S, R 14 E	
		Section 6:	Lot 7, SESW
		Section 7*:	Lot 1*, SESW, SWNESW
		Section 18:	Lots 2 and 3
7) PENTA CREEK LEASE EXTENSION (Extension #1, August, 2010)	402.32	T 14 S, R 14 E	
		Section 6	Lots 1, 2, 3, 4 and 5, SENW, SWNE, NWSE, SWSE, SENE, NWSESE
8) PUMPING STATION (BLM R.O.W. UTU-7712)	0.23	T 14 S, R 13 E	
		Section 21	NESENE (0.23 acres thereof, containing pumping station)

TABLE 1-4 (continued)

9) TOPSOIL SALVAGE AREA (SITLA special use agreement #1163)	9.6	T 14 S, R 13 E	
		Section 16:	E2NESE (9.6 acres thereof, containing substitute topsoil area)
10) CATCHMENT STRUCTURE A (BLM R.O.W . UTU-87110)		T 14 S, R 13 E	
	0.23	Section 15:	SESW (0.23 acres thereof, containing catchment structure)
11) CATCHMENT STRUCTURE C (BLM R.O.W . UTU-87110)		T 14 S, R 13 E	
	0.23	Section 28:	NWNW (0.23 acres thereof, containing catchment structure)
12) CATCHMENT STRUCTURE E (BLM R.O.W . UTU-87110)		T 14 S, R 12 E	
	0.23	Section 25:	SESE (0.23 acres thereof, containing catchment structure)
13) SECURITY GATE (Carbon County authorization)	0.79	T 14 S, R 13 E	
		Section 15:	NWSENE (0.79 acres thereof, containing security gate)
TOTAL PERMIT AREA	**7600.38 acres**		

*Less and excepting from the portion of the above legal subdivisions in Section 7, those lands under and around Grassy Trail Dam and Reservoir owned by East Carbon City and Sunnyside City, such lands being more accurately described in Appendix 1-15.

TABLE 1-5
LEGAL DESCRIPTION OF PERMIT AREA
(TOTAL AREA)

T13S, R13E	Section 34	NESE, S2SE
	Section 35	All
	Section 36	SW, SWNWSWNW, S2S2NW, S2SWNE, W2SE, SESE, S2NESE, NWNESE,
T13S, R14E	Section 31:	Lot 4, S2SESW, NESESW, SENWSESW, W2SWSE, S2SESWSE, S2S2SESE
T14S, R12E	Section 25	SESE (part thereof containing catchment structure E)
T14S, R13E	Section 1	All
	Section 2	All
	Section 3	Lots 1, 2 and 3, S2N2, S2
	Section 10	All
	Section 11	All
	Section 12	All
	Section 13	All
	Section 14	E2, N2NW, SENW
	Section 15	NENE, NWSENE (part thereof, containing security gate) SESW (part thereof, containing catchment structure A)
	Section 16	E2NESE (part thereof, containing substitute topsoil area)
	Section 21	NESENE (part thereof, containing pumping station)
	Section 24	N2, N2SE, NESW
	Section 28	NWNW (part thereof, containing catchment structure C)
T14S, R14E	Section 5:	W2W2SWNW, W2NWNWSW
	Section 6	Lots 1, 2, 3, 4, 5, 6 and 7, SENW, E2SW, W2SE, S2NE, N2NESE, SWNESE, NWSESE
	Section 7*	Lots 1*, 3 and 4, SESW, SWNESW
	Section 18	Lots 1, 2 and 3, E2NW

TOTAL PERMIT AREA = 7,600.38 acres.

*Less and excepting from the portion of the above legal subdivisions in Section 7, those lands under and around Grassy Trail Dam and Reservoir owned by East Carbon City and Sunnyside City, such lands being more accurately described in Appendix 1-15.

TABLE 1-6
SURFACE OWNERSHIP OF PERMIT AREA

T(S)/R(E)	Section	BLM	Penta Creek	Hinkins	Wells	Rauhala	SITLA	Total
13/13	34	-	-	-	120.00	-	-	120.00
13/13	35	40.00	-	448.91	151.09	-	-	640.00
13/13	36	-	372.50	-	-	-	-	372.50
13/14	31	108.82	-	-	-	-	-	108.82
14/12	25	0.23	-	-	-	-	-	0.23
14/13	1	283.75	328.68	-	-	39.92	-	652.35
14/13	2	-	641.24	-	-	-	-	641.24
14/13	3	-	-	-	80.66	-	520.44	601.10
14/13	10	360.00	-	-	-	-	280.00	640.00
14/13	11	650.87	-	-	-	-	-	650.87
14/13	12	-	648.96	-	-	-	-	648.96
14/13	13	640.00	-	-	-	-	-	640.00
14/13	14	440.00	-	-	-	-	-	440.00
14/13	15	41.02	-	-	-	-	-	41.02
14/13	16	-	-	-	-	-	9.60	9.60
14/13	21	0.23	-	-	-	-	-	0.23
14/13	24	440.00	-	-	-	-	-	440.00
14/12	28	0.23	-	-	-	-	-	0.23
14/14	5	-	-	15.00	-	-	-	15.00
14/14	6	76.41	478.88	30.00	-	-	-	585.29
14/14	7	74.08	86.69		-	-	-	160.77
14/14	8	-	-		-	-	-	0.00
14/14	18	117.25	74.92	-	-	-	-	192.17
		3272.89	2631.87	493.91	351.75	39.92	810.04	7600.38

TABLE 1-7
DISTURBED AREA WITHIN PERMIT AREA

1) Minesite surface facilities: portions of the following, totaling 29.82 acres (all BLM)

T14S, R13E	Section 10:	SESESE
		NESESE
T14S, R13E	Section 11:	SWNESW
		NWSESW
		NESWSW
		NWSWSW
		SWSWSW
		SESWSW
T14S, R13E	Section 15:	NENENE
		NWNENE
		SWNENE
		SENENE
		NWSENE

2) Pumphouse: portion thereof of the following, containing 0.23 acres (all BLM)

T14S, R13E	Section 21:	NESENE

3) Gob gas vent hole (GVH) installation (main pad): portion thereof of the following, containing 0.24 acres (all SITLA)

T14S, R13E	Section 3:	NESWSE

4) Gob gas vent hole (GVH) installation (GVH 5 "pullout"): portion thereof of the following, containing 0.02 acres (all SITLA)

T14S, R13E	Section 3:	NESWSE

5) Gob gas vent hole (GVH) topsoil pile: portion thereof of the following, containing 0.1 acres (all SITLA)

T14S, R13E	Section 10:	SENWNW

6) Catchment Structure A: portion thereof of the following, containing 0.12 acres (all BLM)

T 14 S, R 13 E Section 15: SESW

7) Catchment Structure C: portion thereof of the following, containing 0.23 acres (all BLM)

T 14 S, R 13 E Section 28: NWNW

8) Catchment Structure E: portion thereof of the following, containing 0.23 acres (all BLM)

T 14 S, R 12 E Section 25: SESE

TOTAL DISTURBED AREA = 30.99 acres

R645-301-115 STATUS OF UNSUITABILITY CLAIMS

115.100 The proposed permit area is not within an area designated as unsuitable for mining. WEST RIDGE Resources, Inc. is not aware of any petitions currently in progress to designate the area as unsuitable for coal mining and reclamation activities.

The area in which the proposed facility will be located has been evaluated within area management plans. It has not been found unsuitable for mining activities under any categories of examination.

115.200 Not applicable.

115.300 WEST RIDGE Resources, Inc. will not be conducting mining operations within 100 feet of an occupied dwelling. WEST RIDGE Resources, Inc. has received permission from Carbon County to construct facilities and operate coal mining activities within 100 feet of a public road. Refer to the letter from Carbon County in Appendix 1-8.

R645-301-116 PERMIT TERM

116.100 The anticipated starting and termination dates of the coal mining and reclamation operation are as follows:

	Begin	Complete
Construction of Mining Pad, Mining Support Structures, and Portals	Apr. 1999	Dec. 1999
Begin Mining	Jan. 2000	
Terminate Mining		Dec. 2017*
Remove Facilities	Jan. 2018*	June 2018*
Regrade Area	July 2018*	Sept. 2018*
Revegetate Site	Oct. 2018*	Nov. 2018*

*This assumes mine life extended through acquisition of adjacent state and federal coal reserves.

116.200 The initial permit application will be for a five year term with successive five year permit renewals.

R645-301-117 INSURANCE, PROOF OF PUBLICATION AND FACILITIES OR STRUCTURES USED IN COMMON

117.100 The Certificate of Liability Insurance is included as Attachment 1-1 in Appendix 1-1.

117.200 A copy of the newspaper advertisement of the application for a permit and proof of publication are included as Attachment 1-2 and 1-3 respectively, in Appendix 1-1. A copy of the newspaper advertisement for the Whitmore lease revision is included as Attachment 1-3 in Appendix 1-1.

117.300 Not applicable.

R645-301-118 FILING FEE

Verification of filing fee payment is included as Attachment 1-4 in Appendix 1-1.

R645-301-123 NOTARIZED STATEMENT

A notarized statement attesting to the accuracy of the information submitted can be referenced as Attachment 1-5 in Appendix 1-1.

R645-301-130 REPORTING OF TECHNICAL DATA

Technical reports prepared by consultants specifically for WEST RIDGE Resources, Inc. are typically presented in an appendix format and, in general, provide the name and address of the person or company (consultant) preparing the report, the name of the report, the date of collection and analysis of the data, and descriptions of the methodology used to collect and analyze the data. The body of the report usually will provide the date the actual field work was conducted and a description of the methodology used to collect and analyze the data. The format of each report may vary depending on the contents of the report and organization preparing it.

For laboratory analyses, such as Appendix 7-2 and 7-3, the company performing the analyses as well as the date of the analyses, is presented on the laboratory report rather than the cover page.

A list of consultants and their appended reports is contained in Appendix 1-6, Consultation and Coordination. Sources used in the preparation of the permit application are referenced in Appendix 1-3. References in all chapters are keyed to this main reference list.

Mining and exploration activities had been conducted in the currently proposed disturbed area prior to August 3, 1977. A road existed into C Canyon in 1952 when drill hole B-6 was drilled in the right fork. A road was also constructed up the left fork of C Canyon to a drill hole site during the same year. In addition to the drill holes, the coal outcrop in the left fork of C Canyon was exposed for sampling purposes. A small pad was built at the outcrop location and it was left in place as were the roads.

In 1986, another drill hole, 86-2, was drilled west of the first drill hole in the right fork. A minor amount of road work was done in conjunction with this second drill hole. Kaiser Coal Company obtained permission from the BLM to grade the existing road and make it passable for the drill rig. The drill hole site was reclaimed but the road, a public road, was left in place.

Through use of aerial photography and site evaluations, it is possible to document previous mining related disturbances in C Canyon. Refer to Map 5-1 for delineation of the disturbance prior to August 3, 1977.

The total of all the previously disturbed areas within the minesite disturbed area is estimated to be as follows:

roads in right and left forks	=	1.27 acres
road culvert	=	.05 acres
water monitoring well	=	.05 acres
material storage pad	=	.05 acres
		1.62 acres

WEST RIDGE Resources, Inc. is proposing to utilize the entire previously disturbed area in their current proposal and to reclaim it upon cessation of mining operations.

In the 1950's a road was constructed in the Right Fork of Bear Canyon to access an exploratory drillhole site. This road now provides access to the site of the Bear Canyon GVH installation. (Refer to Appendix 5-14 for a detailed description of the Bear Canyon GVH facility)

APPENDIX 1-4B(a).....FEDERAL COAL LEASE UTU-78562 MODIFICATION

APPENDIX 1-4B(a)

LEASE ASSIGNMENT

FEDERAL COAL LEASE

UTU-78562 MODIFICATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

MODIFIED COAL LEASE

Serial No. UTU-78562

Date of Lease February 1, 2002

PART I.

THIS MODIFIED COAL LEASE is entered into on JUN 10 2011, by and between the **UNITED STATES OF AMERICA**, hereinafter called the Lessor, through the Bureau of Land Management, and
ANDALEX Resources, Inc.
P. O. Box 910
East Carbon, Utah 84520

hereinafter called Lessees.

This modified lease shall retain the effective date of February 1, 2002, of the original **COAL LEASE UTU-78562**, and is effective for a period of 20 years therefrom, and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms at the end of the 20th lease year (February 1, 2022), and each 10-year period thereafter.

Sec. 1. This lease is issued pursuant and subject to the terms and provisions of the: (NOTE: Check the appropriate Act or Acts.)

XX Mineral Lands Leasing Act of 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

_ Mineral Leasing Act for Acquired Lands of 1947, 61 Stat. 913, 30 U.S.C. 351-359;

and to the regulations and formal orders of the Secretary of the Interior which are now or hereafter in force, when not inconsistent with the express and specific provisions herein.

Sec. 2. Lessees as the holders of Coal Lease UTU-78562, issued effective February 1, 2002, was granted the exclusive right and privilege to drill for, mine, extract, remove or otherwise process and dispose of the coal deposits in, upon, or under the lands described below as Tract 1 and Tract 2.

The Lessor in consideration of fair market value, rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants and leases to Lessee the exclusive right and privilege to drill for, mine, extract, remove, or otherwise process and dispose of the coal deposits in, upon, or under the lands described below as Tract 3.

Tract 1:
T. 13 S., R. 13 E., SLM, Utah
Sec. 35, S½SW¼, SE¼;

T. 14 S., R. 13 E., SLM, Utah
Sec. 1, lots 2-7, SW¼NE¼, S½NW¼, W½SE¼, SW¼,
Sec. 12, lots 1-4, S½N½, NE¼SW¼, SE¼;
Sec. 13, NE¼NE¼;

T. 14 S., R. 14 E., SLM, Utah
Sec. 6, lot 6;
Sec. 7, lots 3 and 4;
Sec. 18, lot 1, E½NW¼.

Tract 2:
T. 13 S., R 13 E., SLM, Utah
Sec. 34, NE¼SE¼, S½SE¼;
Sec. 35, N½, N½SW¼;

T. 14 S., R. 13 E., SLM, Utah
Sec. 1, lot 1;

T. 14 S., R. 14 E., SLM, Utah
Sec. 6, NE¼SW¼.

Tract 3:
T. 13 S., R. 14 E., SLM, Utah
Sec. 31, lot 4, S½SE¼SW¼, NE¼SE¼SW¼, SE¼NW¼SE¼SW¼, W½SW¼SE¼,

T. 14 S., R. 14 E., SLM, Utah
Sec. 5, lot 4, W½W½SW¼NW¼, SW¼NW¼SW¼, W½NW¼NW¼SW¼,

S½SE¼SW¼SE¼, S½S½SE¼SE¼; W½SW¼SW¼;
Sec. 6, NE¼SE¼;
Sec. 8, W½NW¼NW¼, W½SE¼NW¼NW¼, SW¼NE¼NW¼NW¼, W½SW¼NW¼, W½E½SW¼NW¼, W½NW¼SW¼, SW¼SW¼;
Sec. 17, N½NW¼NW¼NW¼.

containing 2,605.49 acres, more or less,

together with the right to construct such works, buildings, plants, structures, equipment and appliances and the right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

Part II. TERMS AND CONDITIONS

Sec. 1.(a) RENTAL RATE - Lessee shall pay Lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate of $3.00 per acre for each lease year.

(b) RENTAL CREDITS - Rental shall not be credited against either production or advance royalties for any year.

Sec. 2.(a) PRODUCTION ROYALTIES - The royalty shall be 8 percent of the value of the coal as set forth in the regulations. Royalties are due to Lessor the final day of the month succeeding the calendar month in which the royalty obligation accrues.

(b) ADVANCE ROYALTIES - Upon request by the Lessee, the authorized officer may accept, for a total of not more than 10 years, the payment of advance royalties in lieu of continued operation, consistent with the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons determined in the manner established by the advance royalty regulations in effect at the time the Lessee requests approval to pay advance royalties in lieu of continued operation.

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease bond in the amount of $905,000.00 . The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 4. DILIGENCE - This lease is subject to the conditions of diligent development and continued operation. Continued operation may be excused when operations under the lease are interrupted by strikes, the elements, or casualties not attributable to the Lessee. The Lessor, in the public interest, may suspend the condition of continued operation upon payment of advance royalties in accordance with the regulations in existence at the time of the suspension. Lessees' failure to produce coal in commercial quantities at the end of ten years from the original date of this lease shall terminate the lease.

The Lessor reserves the power to assent to or order the suspension of the terms and conditions of this lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

Sec. 5. **LOGICAL MINING UNIT (LMU)** - The lands contained in the original lease have been included in the LMU application UTU- 86007 filed February 1, 2008 . Within 30 days after the effective date of this lease modification, the Lessee shall amend its application for the Westridge Logical Mining Unit to include the 602.91 acres added to Coal Lease UTU- 78562 by this modification. The modified land shall be segregated into another Federal coal lease should the Lessee fail to file such an amendment.

The stipulations established in an LMU approval in effect at the time of LMU approval or modification will supersede the relevant inconsistent terms of this lease so long as the lease remains committed to the LMU. If the LMU of which this lease is a part is dissolved, the lease shall then be subject to the lease terms which would have been applied if the lease had not been included in an LMU.

Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION - At such times and in such form as Lessor may prescribe, Lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of Lessor, the leased premises and all surface and underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall allow Lessor access to and copying of documents reasonably necessary to verify Lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Action (5 U.S.C. 552).

Sec. 7. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS - Lessee shall comply at its own expense with all reasonable orders of the Secretary, respecting diligent operations, prevention of waste, and protection of other resources.

Lessee shall not conduct exploration operations, other than casual use, without an approved exploration plan. All exploration plans prior to the commencement of mining operations within an approved mining permit area shall be submitted to the authorized officer.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users. Lessee shall take measures deemed necessary by Lessor to accomplish the intent of this lease term. Such measures may include, but not limited to, modification to proposed siting or design of facilities, timing of operations, and specifications of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of Lessee as may be consistent with concepts of multiple use and multiple mineral development.

Sec. 8 **PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY** - Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergences; and take measures necessary to protect the health and safety of the public. No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor. Neither Lessee nor Lessee's subcontractors shall maintain segregated facilities.

Sec. 9.(a) **TRANSFERS**
(Check the appropriate space)

X This lease may be transferred in whole or in part to any person, association or corporation qualified to hold such lease interest.

— This lease may be transferred in whole or in part to another public body, or to a person who will mine the coal on behalf of, and for the use of, the public body or to a person who for the limited purpose of creating a security interest in favor of a lender agrees to be obligated to mine the coal on behalf of the public body.

— This lease may only be transferred in whole or in part to another small business qualified under 13 CFR 121.

Transfers of record title, working or royalty interest must be approved in accordance with the regulations.

(b) **RELINQUISHMENTS** - The Lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon Lessor's acceptance of the relinquishment, Lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

Sec. 10. **DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC.** - At such times as all portions of this lease are returned to Lessor, Lessee shall deliver up to Lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, Lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the Lessor, but Lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the Lessor. If the surface is owned by third parties, Lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by Lessee's activity or activities incidental thereto, and reclaim access roads or trail.

Sec. 11. **PROCEEDINGS IN CASE OF DEFAULT** - If Lessee fails to comply with applicable laws, existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the Lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by Lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time.

Sec. 12. **HEIRS AND SUCCESSORS - IN-INTEREST** - Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall insure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

Sec. 13. **INDEMNIFICATION** - Lessee shall indemnify and hold harmless the United States from any and all claims arising out of the Lessee's activities and operations under this lease.

Sec. 14. **SPECIAL STATUTES** - This lease is subject to the Federal Water Pollution Control Act (33 U.S.C. 1151 - 1175); the Clean Air Act (42 U.S.C. 1857 et seq.), and to all other applicable laws pertaining to exploration activities, mining operations and reclamation, including the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)

Sec. 15. **SPECIAL STIPULATIONS** -

SEE ATTACHED STIPULATIONS

Andalex Resources, Inc.
Company or Lessee Name

David W. Hibb
(Signature of Lessee)

President
(Title)

5/26/11
(Date)

The United States of America

BY [signature]

Kent Hoffman
(Signing Officer)

Deputy State Director - Lands & Minerals
(Title)

JUN 10 2011
(Date)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

SPECIAL STIPULATIONS FOR UTU-78562
MODIFIED COAL LEASE

1. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements f this act and are subject to compliance with Office of Surface Mining regulations, or as applicable the Utah program approved under the cooperative agreemne6t in accordance with sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.

2. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee prior to disturbance shall, immediately bring them to the attention of the Authorized Officer. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

3. If there is reason to believe that Threatened or Endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area, the Lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

4. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a paleontological appraisal of the areas to be disturbed. The appraisal shall be conducted by a qualified paleontologist and a report prepared itemizing the findings.

A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified paleontological resources.

If paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the authorized officer who shall evaluate, or have evaluated such discoveries and, within 5 working days, shall notify the lessee what action shall be taken with respect to such discoveries. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracts commonly encountered during underground mining.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measure shall be borne by the lessee. The cost of salvage of paleontological remains (fossils) shall be borne by the United States.

5. The Lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data are adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the interrelationship of the geology, topography, surface and ground water hydrology, vegetation and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

6. Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

7. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal-handling and storage facilities on the lease area. The migration of road surfacing and subsurface materials into streams and water courses shall be prevented.

8. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data. The monitoring system shall be adequate to locate and quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation and wildlife.

9. Except at locations specifically approved by the Authorized Officer with concurrence of the surface management agency, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

10. In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specifically approved locations.

11. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to an authorized post mining land use.

12. The Lessee at the conclusion of the mining operation, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed, or displaced corner monuments (section corners, quarter corners, etc.) their accessories and appendages (witness trees, bearing trees, etc.), or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the Lessee, by BLM to the standards and guidelines found in the Manual of Surveying Instructions, U.S. Department of Interior.

13. Notwithstanding the approval of a resource recovery and protection plan by the BLM, lessor reserves the right to seek damages against the operator/lessee in the event (I) the operator/lessee fails to achieve maximum economic recovery [as defined at 43 CFR §3480.0-5(21)] of the recoverable coal reserves or (ii) the operator/lessee is determined to have caused a wasting of recoverable coal reserves. Damages shall be measured on the basis of the royalty that would have been payable on the wasted or un-recovered coal.

The parties recognize that under an approved R2P2, conditions may require a modification by the operator/lessee of that plan. In the event a coal bed or portion thereof is not to be mined or is rendered unminable by the operation, the operator shall submit appropriate justification to obtain approval by the AO to leave such reserves unmined. Upon approval by the AO, such coal beds or portions thereof shall not be subject to damages as described above. Further, nothing in this section shall prevent the operator/lessee from exercising its right to relinquish all or a portion of the lease as authorized by statute and regulation.

In the event the AO determines that the R2P2 modification will not attain MER resulting from changed conditions, the AO will give proper notice to the operator/lessee as required under applicable regulations. The AO will order a new R2P2 modification if necessary, identifying additional reserves to be mined in order to attain MER. Upon a final administrative or judicial ruling upholding such an ordered modification, any reserves left un-mined (wasted) under that plan will be subject to damages as described in the first paragraph under this section.

Subject to the right to appeal hereinafter set forth, payment of the value of the royalty on such un-mined recoverable coal reserves shall become due and payable upon determination by the AO that the coal reserves have been rendered un-minable or at such time that the lessee has demonstrated an unwillingness to extract the coal.

The BLM may enforce this provision either by issuing a written decision requiring payment of the MMS demand for such royalties, or by issuing a notice of non-compliance. A decision or notice of non-compliance issued by the lessor that payment is

due under this stipulation is appealable as allowed by law.

14. WASTE CERTIFICATION: The lessee shall provide upon abandonment and/or sealing off a mined area and prior to lease termination/relinquishment, certification to the lessor that, based upon a complete search of all the operator's records for the mine and upon their knowledge of past operations, there has been no **hazardous substances** per (40 CFR 302.4) or **used oil** as per Utah State Management Rule R-315-15, deposited within the lease, either on the surface or underground, or that all remedial action necessary has been taken to protect human health and the environment with respect to any such substances remaining on the property. The back-up documentation to be provided shall be described by the lessor prior to the first certification and shall include all documentation applicable to the Emergency Planning and Community Right-to-know Act (EPCRA, Public Law 99-499), Title III of the Superfund Amendments and Reauthorization Act of 1986 or equivalent.

15. ABANDONMENT OF EQUIPMENT: The lessee/operator is responsible for compliance with reporting regarding toxic and hazardous material and substances under Federal Law and all associated amendments and regulations for the handling such materials on the land surface and in underground mine workings.

The lessee/operator must remove mine equipment and materials not needed for continued operations, roof support and mine safety from underground workings prior to abandonment of mine sections. Exceptions can be approved by the Authorized Officer (BLM) in consultation with the surface management agency. Creation of a situation that would prevent removal of such material and by retreat or abandonment of mine sections without prior authorization would be considered noncompliance with lease terms and conditions and subject to appropriate penalties under the lease.

16. UNDERGROUND INSPECTION: All safe and accessible areas shall be inspected prior to being sealed. The lessee shall notify the Authorized Officer in writing 30 days prior to the sealing of any areas in the mine and state the reason for closure. Prior to seals being put into place, the lessee shall inspect the area and document any equipment/machinery, hazardous substances, and used oil that is to be left underground.

The purpose of this inspection will be: (1) to provide documentation for compliance with 42 U.S.C. 9620 section 120(h) and State Management Rule R-315-15, and to assure that certification will be meaningful at the time of lease relinquishment, (2) to document the inspection with a mine map showing location of equipment/machinery (model, type of fluid, amount remaining, batteries etc.) that is proposed to be left underground. In addition, these items will be photographed at the lessee's expense and shall be submitted to the Authorized Officer as part of the certification. The abandonment of any equipment/machinery shall be on a case by case basis and shall not be accomplished unless the Authorized Officer has granted a written approval.

17. GOB VENT BOREHOLES. The Lessee shall submit a gob vent borehole plan for approval by the AO as part of an R2P2 for all gob vent boreholes. The plugging portion of the plan must meet 43 CFR 3484.1(a)(3) as a minimum. If variations to the approved plugging procedures are necessary, they shall also be approved by the AO in writing prior to implementation of the procedures.

18. The holder of this lease shall be required to conduct appropriate surveys for Mexican Spotted owls on the lease tract areas with 40 percent or greater slope, cliff habitat areas, riparian habitats, and mixed conifer forest habitats, prior to surface disturbing activities and or development with a potential to interrupt springs. Inventory work will be conducted by parties approved and permitted for such survey work by the Authorized Officer of the BLM and conducted following current protocols established by the USFWS.

19. SEISMIC STIPULATION: Mining operations shall be conducted in a manner to prevent seismic events that would cause damage to surface or subsurface structures such as: power lines or mine pillars and other structures such as Grassy Trail Reservoir and/or create hazardous conditions such as landslides.

The lessee shall: (1) Provide a seismic risk assessment of the Grassy Trail Reservoir to the AO prior to mining in the lease. (2) Prior to mining in the lease, the Lessee shall provide a plan to monitor the Reservoir and the steps necessary to mitigate any damage created by the Lessee. These plans shall be updated by the Lessee as deemed necessary by the AO.

The AO will either approve or may prescribe the mining methods used, the amount of coal recovered or determine the corrective measures necessary to assure protection of surface or subsurface structures and resources. The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under

the lease.

20. FAIR MARKET VALUE BONUS: Due to the uncertainty of the amount of recoverable coal reserves in this modification, the lessee will pay the fair market value (FMV) bonus payment for the coal resources mined in the area of Federal coal lease modification (U78562) Tract 2, at the rate of $0.35 per ton for the actual tonnage mined, adjusted annually using the U. S. Bureau of Labor Statistics CPI West Urban Energy Index; or if that index is not available an index that is mutually agreed to by the lessee and the authorized officer will be used. Payment of FMV at the specified rate and tonnage mined will be on the schedule required for payment of production royalties to the Office of Natural Resources Revenue (ONRR). The lessee will clearly indicate which portion of the payment is for royalty and what is for the lease bonus payment.

21. FAIR MARKET VALUE BONUS: Due to the uncertainty of the amount of recoverable coal reserves in this modification, the lessee will pay the fair market value (FMV) bonus payment for the coal resources mined in the area of Federal coal lease modification (U78562) Tract 3, at the rate of $0.37 per ton for the actual tonnage mined , adjusted annually using the U. S. Bureau of Labor Statistics CPI West Urban Energy Index; or if that index is not available an index that is mutually agreed to by the lessee and the authorized officer will be used. Payment of FMV at the specified rate and tonnage mined will be on the schedule required for payment of production royalties to the Office of Natural Resources Revenue (ONRR). The lessee will clearly indicate which portion of the payment is for royalty and what is for the lease bonus payment.

CHAPTER 5.....REPLACEMENT PAGES

CHAPTER 5
R645-301-500 ENGINEERING

Historical Note 1: In the spring of 2009, and again in the summer of 2010, the company constructed small catchment structures in the C Canyon drainage below the minesite. The purpose of these structures was to contain coal-fines which had accumulated in the drainage channel as a result of non-compliance discharge water from the mine, and to assist in the subsequent clean-up project. After the unit was constructed it was determined that it should be included within the Mining and Reclamation Plan. Please refer to Appendix 5-15 for a complete description of these catchment structures, including history, location, right-of-entry, as-built design, operational criteria, and reclamation information.

Historical Note 2: In the summer of 2011 the company acquired a modification of federal lease UTU-78562 along the eastern side of the permit area. Mining in this new lease will involve development mining under the stream in the Right Fork of Whitmore Canyon which supplies most of the water to the Grassy Trail Reservoir. Due to concerns for the water rights in this area the company has agreed to collecting additional hydrologic baseline data. This data acquisition will include, but is not limited to the following:

a) Installation and/or rehabilitation of measuring flumes in the upper and lower reaches of both Right and Left Forks of Whitmore Canyon above the reservoir (total of 4 ea. flumes).

b) Installation of subsidence monitoring stations at approximate 100' intervals along the bottom of the Right Fork drainage within the permit area.

c) Installation of flow meters within the underground mine water collection/pumping system sufficient to adequately assess the quantity and location of groundwater sources encountered in the mine works in the vicinity of the Right Fork.

d) On-site location and development of selected springs in the Right Fork area subject to future monitoring, conducted in conjunction with stakeholder input.

e) Expansion of the seep and spring survey in the Right Fork to include more of the upper drainage area above longwall Panel #22.

f) Completion of a detailed gain-loss analysis of the stream flow in the Right Fork within the area of proposed development mining.

It should be noted that there will be no longwall mining under (beneath) the Right Fork of Whitmore Canyon, nor any other mining that would result in subsidence under the drainage of the Right Fork. The only mining under the Right Fork will be a limited number of development entries associated with the longwall bleeder system. All such development mining associated with Panel #22 will be conducted at depths in excess of 2600' below the Right Fork drainage.

Information regarding the subsidence monitoring points in the Right Fork can be found in Appendix 5-18.

Information regarding the underground (in-mine) flow meters can be found in Appendix 7-16.

Information regarding the expanded seep and spring survey can be found in Appendix 7-6B.

Information regarding the gain-loss analysis of the Right Fork can be found in Appendix 7-14.

R645-301-511 GENERAL REQUIREMENTS

Chapter 5 contains information regarding the proposed coal mining operation and reclamation plans, a discussion of its potential impact to the environment and methods to achieve compliance with design criteria.

Reclamation plans and estimates are presented for postmining restoration of the area.

NOTE: The following discussion for the remainder of R645-301-511 applies specifically to the Gob Gas Vent Hole (GVH) installation proposed in Bear Canyon. In order to facilitate the review it is presented here in its entirety rather than interspersed throughout the chapter. A more detailed and complete discussion of the Bear Canyon GVH proposal can be found in Appendix 5-14. Unless specifically noted in this following discussion, nothing related to the Bear Canyon GVH proposal affects the contents of the existing approved MRP as described hereinafter.

The GVH facility will consist of three drillholes, four methane extractor units, and interconnecting piping. A detailed description of the drillhole installation, and the assembly and operation of the methane extractor units can be found in Attachment 7 of Appendix 5-14. The site pad will consist of a narrow strip (approximately 35' wide x 300' long) located adjacent to and parallel with the road. The drillholes will be located at the southern (down-canyon) end of the site pad. The extractor units will be located in a serial arrangement along the northern (up-canyon) end of the site pad. The total facility area will be about 0.24 acres, including the adjacent cutslopes.

Three angled holes will be drilled at angles ranging from 20 degrees to 45 degrees from vertical. Drilling will be conducted using tri-cone rotary and/or hammer. Drilling fluid will be primarily compressed air (600-800 psi) with water and Baroid Quick Foam and EZ Mud (see Attachment 15 for MSDS sheets for these products). Cuttings will pass up the annulus and be diverted to the reserve pit on the surface. Each hole will be spudded with a 19" diameter hole into which a 16" diameter conductor casing will be set and grouted to an approximate depth of 20'. Thereafter, a 12.25" hole will be drilled to within 200' of the Lower Sunnyside coal seam (an inclined depth of 200'-300'). A 9.625" T&C casing will be set and grouted to total depth of the 12.25" bore. An 8.75" bit will be tripped in to drill out the shoe and will continue about 175' to within 25' of the coal seam horizon. Sections of 7" slotted casing will be tripped in from bottom of hole to about 40' above the bottom of the upper casing, but will not be grouted so that it can move with any additional subsidence.

Before construction starts identification signs will be posted at the site. These signs will list the company name as permit holder, the permit number, address and phone number. During the initial phase of construction, topsoil will be salvaged. Based on a recent Order 1 soils survey the current estimate of topsoil to be salvaged is

As mentioned in the BLM approval letter, mining of panel block 18-20 will be further distance away from the Grassy Trail dam than with panel 7. Panel 7 mined within 995' (horizontal) from the dam, while the closest mining from Block 18-20 would be more than 3000' (horizontal) away. Also, panel 7 was about 1664' stratigraphically lower than the dam, while panel block 18-20 is located more than 2200' lower than the dam. The hypocentral distance of panel 7 was 1939' from the dam, compared to 3723' for the closest distance for panel block 18-21. Also, panel 7 was mined using side-by-side panels, whereas panel block 18-20 will be mined as panel-barrier, further reducing the potential for seismicity.

In the 2005 approval of Panel 7, BLM added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, "*The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease.*" This new 2010 BLM approval for panel block 18-20 contains reference to this same lease stipulation #17. It should also be noted that, as with previous mining of panel 7, the Utah Division of Dam Safety will have authority to stop any longwall mining of panel block 18-21 if it determines that mining-related seismicity or subsidence is creating, or has created, an unacceptable level of risk to the Grassy Trail dam or reservoir, based on monitoring at the time.

On June 17, 2011, BLM approved longwall panel 23 within the Federal lease modification UTU-78562 (see Appendix 5-3D). On September 20, 2011, BLM approved extraction of longwall panel 22, also in lease modification UTU-78562 (see Appendix 5-3E). It should be noted that there will be no longwall mining under (beneath) the Right Fork of Whitmore Canyon, nor any other mining that would result in subsidence under the drainage of the Right Fork. The only mining under the Right Fork will be a limited number of development entries associated with the longwall bleeder system. All such development mining associated with Panel #22 will be conducted at depths in excess of 2600' below the Right Fork drainage. However, due to concerns for the stream-flow in the Right Fork, the company has installed survey monitoring stations at approximate 100' intervals in the bottom of the Right Fork drainage within the permit area to detect any potential vertical or horizontal movement in the area. These monitoring stations are shown in greater detail on Map 5-7 and in Appendix 5-18. These points will be monitored for at least eighteen months after the final mining in this area has been completed and the lower (northeast) half on the mine has been sealed, according to MSHA and BLM approvals, presently scheduled for March, 2013. These points will be monitored quarterly (subject to winter-time accessability) and the results will be forwarded electronically to the Division, and will also be provided in the annual reports. Again it should be emphasized that there will be no longwall mining conducted under the Right Fork drainage. The only mining will be the development entries associated with the ventilation bleeders, identical to those previously approved by the Division for similar gate roads already developed under the Right Fork for longwall panel #20. All mining in this area is under more than 2500' of cover.

525.300 Public Notice of Proposed Mining

No coal mining will be conducted under any buildings, facilities or impoundments (other than the recreational cabin referred to in 521.120). The BLM will be kept informed as to the dates and locations of mining activities. All owners of surface property and structures (BLM) above the underground works will receive notification at least six months prior to mining of the specific areas in which mining will take place, dates of mining and the location at which the subsidence control plan may be examined.

525.480 State Appropriated Water Replacement Mitigation

WEST RIDGE Resources, Inc. commits to mitigate the diminution or degradation of state appropriated waters within or adjacent to the permit area caused by surface affects of mine related subsidence. Mitigation measures would include such measures as sealing surface cracks with expansive clay materials (such as bentonite), trucking water, piping across fracture zones, transfer of water rights, installation of wildlife guzzlers and/or compensation to water rights owners.

525.480 Bear Canyon is situated in the northwest portion of the permit area within the SITLA lease area. This canyon is unique because it is within the right fork of this drainage that the cover over the longwall subsidence zone is the shallowest of anywhere in the entire permit area. In one part of the bottom of the (right fork) Bear Canyon drainage the cover over the longwall panes is approximately 325'. Due to the increased potential for the effects of subsidence to reach the surface in this area special attention has been focused on the hydrologic character of the Bear Canyon drainage.

Bear Canyon is typical of the canyons draining the southwest-facing front slopes of the Book Cliffs in this area. These canyons are generally shorter and drier than those drainages on the back-side of the Cliffs. Several baseline surveys of Bear Canyon right fork done in the late 1980's showed the drainage to be mostly dry and the canyon was identified as ephemeral along with other similar front-facing canyons in the permit area, such as "C" Canyon, "B" Canyon, and "A" Canyon. However, during site visits in June and July of 2005, substantial stream-flow was observed in the drainage. This occurrence of flow, along with the observation of riparian vegetation in the lower stretches of the canyon, has led to a re-evaluation of the classification of the drainage as intermittent. Also, because the area of the Bear Canyon watershed is greater than one square mile the drainage is classified as intermittent under DOGM regulations.

Historical observation of Bear Canyon shows the streamflow in the bottom of the drainage to be a combination of surface flow and subsurface flow. In those areas where bedrock is at or close to the surface, flow is forced up to the surface. In other areas where the alluvium in the channel is thick and porous the flow is subsurface and the stream channel is often dry. The stretches of channel exhibiting surface flow as opposed to subsurface flow will vary from season to season, and year to year depending on prior precipitation trends in the watershed. There are times when the entire length of the channel could be expected to exhibit surface flow, and other times when surface flow is confined to certain segments. And, according to past monitoring

APPENDIX 5-3E.....BLM APPROVAL OF PANEL #22

APPENDIX 5-3E

BLM R2P2
APPROVAL OF LONGWALL PANEL #22

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Green River District, Price Field Office
125 South 600 West
Price, UT 84501
Phone: (435) 636-3600 Fax: (435) 636-3657
http://www.blm.gov/ut/st/en/fo/price.html

TAKE PRIDE IN AMERICA

In Reply Refer To:
3482(UTG023)
SL-068754
UTU-78562

SEP 20 2011

CERTIFIED MAIL—7010-3090-0002-7831-0153
RETURN RECEIPT REQUESTED:

Mr. David Hibbs
President
UtahAmerican Energy, INC.
P.O. Box 910
East Carbon, Utah 84520

Re: Minor Modification to Resource Recovery and Protection Plan, Longwall Panel # 22, West Ridge Mine, UtahAmerican Energy, Inc.

Dear President Hibbs:

The Bureau of Land Management (BLM) received from UtahAmerican Energy, Inc. (UEI), a minor modification, dated July 21, 2011, to the approved resource recovery and protection plan (R2P2) at the subject mine. The modification would add an additional longwall panel (longwall panel 22) and halt the development mining on private coal in longwall panel 20. Only the access main entries and the first few hundred feet of panel development entries are on Federal coal lease (modified) UTU-78562 for panel 22. The shortened portion of longwall panel 20 is all on private coal.

Proposed Plan: UEI proposes to mine an additional longwall panel (panel 22) on the northeast side of the Main Entries. This would be the fifth longwall panel on the right side of the Main Entries from the previously approved four panels. UEI would mine in sequence panels 20 through 22 down dip and then extract up dip panels 18 and 19. Recent acquisition of coal rights (Federal coal lease modification of the south portion of section 31, T. 13 S., R. 14 E., and private coal rights to the east) and the successful mining of previous longwall panels at depth, are reasons given by UEI for the modification.

In addition, the length of longwall panel # 20 is proposed to be shortened to crosscut 27 due to encountering rock partings in the coal seam that have made coal quality unacceptable past this crosscut. All the affected area is on private coal but in areas included in your Logical Mining Unit (LMU) application.

Evaluation and Inspection of Proposal: Design and extraction of longwall panels on the left side of the Main Entries, with similar characteristics to proposed panel 22, have been successful. The depth of panel 22 is no more than other extracted panels. Similar panel designs for stability and stress analysis have been evaluated and approved. We agree with the proposal to add panel 22 to the R2P2. With regards to longwall panel 20, the BLM has inspected the 14th East development entries on June 12, 2011, and have verified the rock partings in the coal seam. Though the entire affected portion of this longwall panel is on non-federal coal lands, we agree that further development cannot continue due to the extent and size of the rock parting.

Approval: The R2P2 modification is approved as submitted for longwall panel 22 for only the portions of the mining area on Federal coal lease UTU-78562. Authorization for mining activities on non-federal coal will need approval/permit revision from Utah Division of Oil Gas and Mining (UDOGM) if not already approved. The changes to longwall panel 20 are entirely on non-federal coal, and again would require authorization from the UDOGM. Approval for adding panel 22 to the R2P2 is conditioned on approval and/or updates of all plans residing with Mine Safety and Health Administration.

Maximum Economic Recovery (MER): Addition of this longwall panel will add additional recoverable coal to the R2P2 and will achieve MER for Federal coal lease UTU-78562.

Recoverable Reserve Base: By adding panel 22 to the R2P2, the recoverable coal reserves for Federal coal lease UTU-78562 will be increased from 12,487,642 tons to 12,670,142 tons, an increase of 182,500 tons. The recoverable reserves for the other Federal coal lease at the mine SL-068745 remains the same at 17,827,365 tons. Coal reserves adjustments for non-federal lands will be addressed later as we process your LMU application for the West Ridge Mine.

National Environmental Policy Act (NEPA): No new surface disturbance is predicted with this plan change, and therefore this action is Categorically Excluded from NEPA analysis as explained in the Department manual (45 DM Part 516 11.5 (F)(8)): approval of minor modifications to, or minor variances from activities described in an approved underground or surface mine plan for leasable minerals (e.g., change in mining sequence or timing).

The BLM has determined that this modification complies with the Mineral Leasing Act of 1920, as amended, the regulations at 43 CFR 3480, and the lease terms and conditions in UTU-78562. The modification is approved as shown on the enclosed mine map with regards only to the Federal coal on lease UTU-78562.

If you have any questions, please contact Steven Rigby (435-636-3604) or Stephen Falk (435-636-3605) of my staff.

Sincerely,

Patricia A. Clabaugh

Patricia A. Clabaugh
Field Manager

Enclosure: (1)
Approved Mine Map

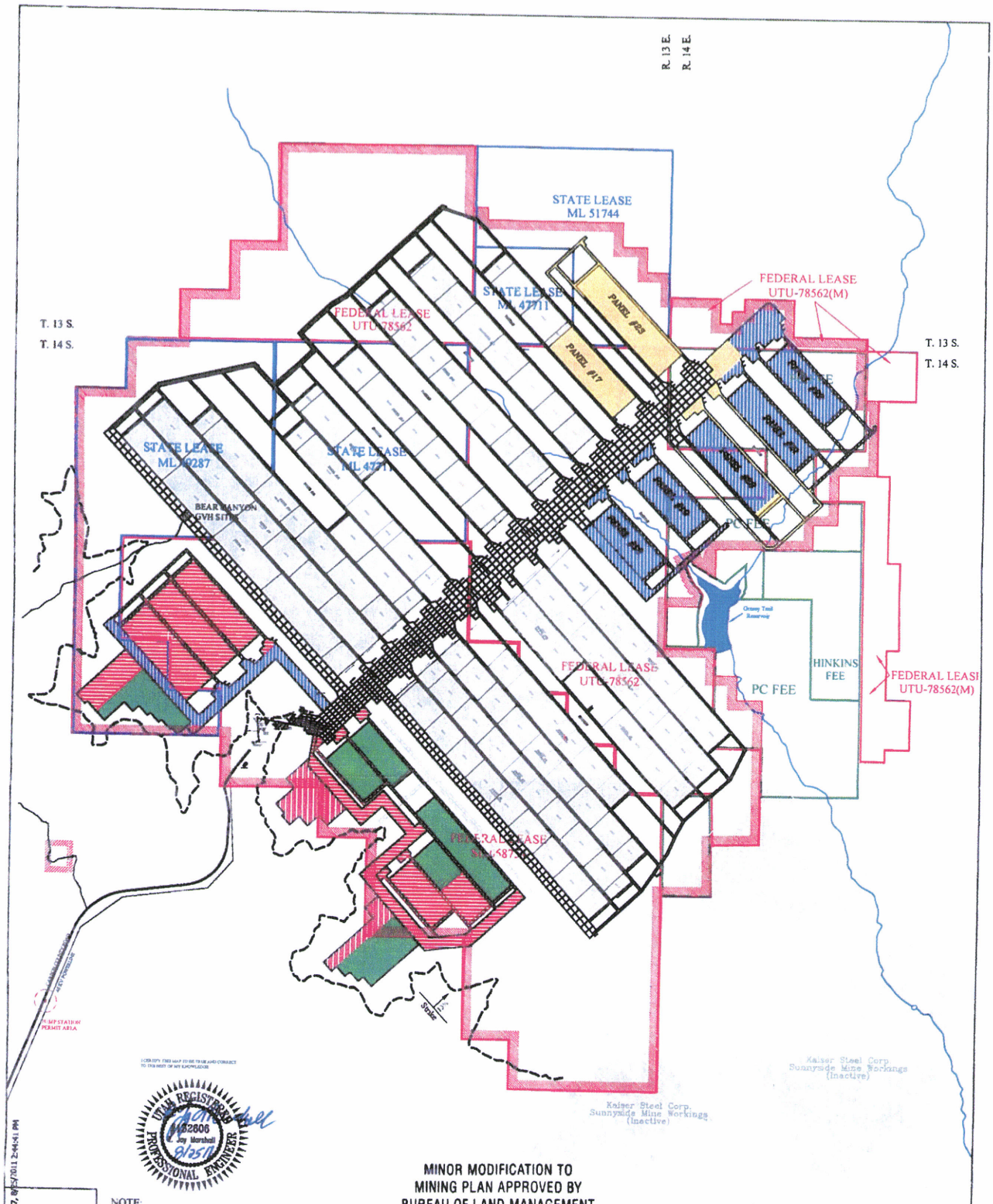
cc: Green River District

Utah State Office

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

State of Utah
School and Institutional Trust Land Administration
675 East 500 South
Salt Lake City, Utah 84102-2818

Mine Safety and Health Administration
P. O. Box 25367
Denver, Colorado 80225-0376



UTAH REGISTERED 172806 Jay Marshall PROFESSIONAL ENGINEER 8/25/11

MINOR MODIFICATION TO MINING PLAN APPROVED BY BUREAU OF LAND MANAGEMENT

Recommended By:

Mining Engineering 9/14/11 (Date)

Approved By:

Patricia A. Clabaugh

Area Manager 9/16/11 (Date)

YEAR KEY:

2011
2012
2013
2014
2015
Mined Area

NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of July 5, 2011.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

R. 13 E. R. 14 E.

1250 0 2500 5000 FEET

WEST RIDGE MINE
R2P2 MODIFICATION
Mining Projections (Extended Reserves)

DATE 8-25-11 REV 1 ACAD REF WR R2P2 8 25 11

LEGEND:
Permit Boundary
Federal Lease
State Lease
Private Fee
Surface Facility Area
GVH Site
Outcrop

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

d:\Current Drawings\MRP Maps\West Ridge Mine\R2P2 Maps\WR R2P2 8-25-11.dwg, 5500, 11x17, 8/25/2011 12:44:41 PM

APPENDIX 5-18.....SUBSIDENCE MONITORING RIGHT FORK OF WHITMORE CANYON

APPENDIX 5-18

SUBSIDENCE MONITORING SURVEY POINTS
RIGHT FORK OF WHITMORE CANYON

WARE SURVEYING, L.L.C.

1344 North 1000 West – Price, UT 84501
Office: 435-613-1266
Email: waresurveying@emerytelcom.net

November 9, 2011

UtahAmerican Energy
Attn: Dave Shaver

Dear Mr. Shaver,

The purpose of this letter is to document and summarize my involvement with the subsidence monitoring survey in the Right Fork of Whitmore Canyon above and Northeasterly of Grassy Trail Reservoir. My company was hired by the West Ridge Mine as a survey consultant to monitor the subsidence above the proposed long wall panels earlier this year.

The survey began by constructing 44 monuments along and near the road and creek. These points were set roughly 100 feet apart, but their separation was adjusted to best fit the terrain and vegetation in order to provide the best access, and survey accuracy. Because the points are being monitored by GPS it was important to avoid heavily treed areas.

The monuments consist of 5/8" diameter rebar, roof bolts, and holes drilled into existing exposed boulders.

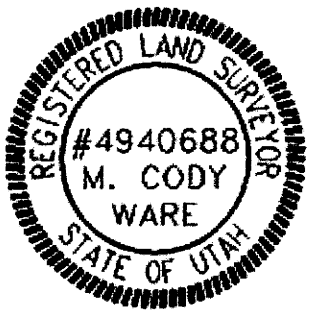
Survey grade GPS equipment was and will be used to monitor these monuments. The anticipated accuracy of the survey is +/- 0.05 feet.

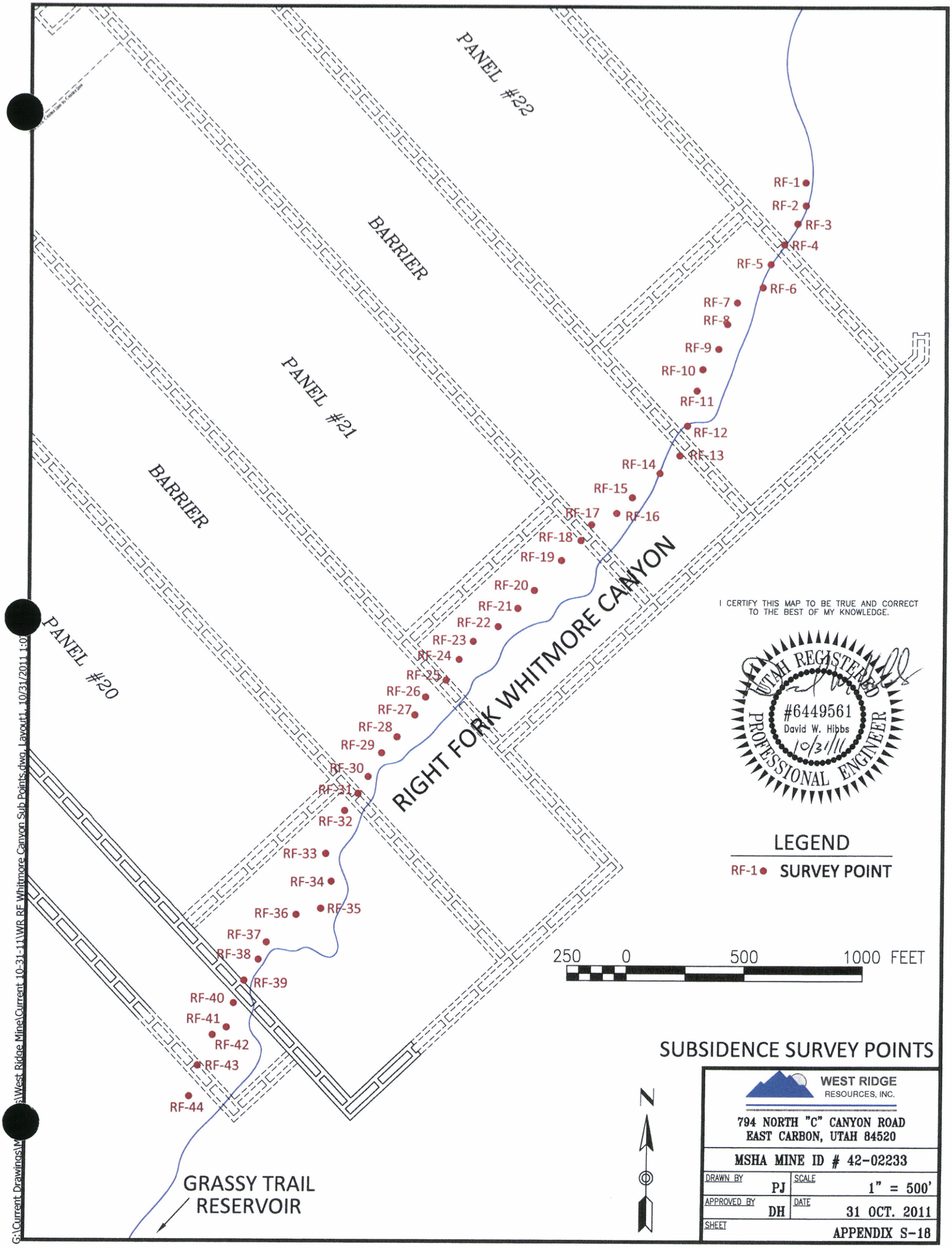
It is my experience that some seasonal movement due to freezing and thawing should be expected and could reflect movement of more than 0.1 feet. The annual survey data should help show this trend.

Surveys will be conducted at a time and frequency specified to me by West Ridge, weather and access permitting. Reports and data will be emailed to any interested parties approved to me by West Ridge.

Sincerely,

M. Cody Ware, PLS




PANEL #22
BARRIER
PANEL #21
BARRIER
PANEL #20
RIGHT FORK WHITMORE CANYON
RF-1
RF-2
RF-3
RF-4
RF-5
RF-6
RF-7
RF-8
RF-9
RF-10
RF-11
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RF-13
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RF-40
RF-41
RF-42
RF-43
RF-44
GRASSY TRAIL
RESERVOIR
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.
UTAH REGISTERED
#6449561
David W. Hibbs
10/31/11
PROFESSIONAL ENGINEER
LEGEND
RF-1 SURVEY POINT
250 0 500 1000 FEET
N
SUBSIDENCE SURVEY POINTS
WEST RIDGE
RESOURCES, INC.
794 NORTH "C" CANYON ROAD
EAST CARBON, UTAH 84520
MSHA MINE ID # 42-02233
DRAWN BY PJ
SCALE 1" = 500'
APPROVED BY DH
DATE 31 OCT. 2011
SHEET APPENDIX S-18
G:\Current Drawings\West Ridge Mine\Current 10-31-11\WR RF Whitmore Canyon Sub Points.dwg, Layout1, 10/31/2011 1:0

UtahAmerican Energy, Inc.

West Ridge Mine - Subsidence Survey

Whitmore Canyon - Right Fork

10/22/2011

STATION	NORTHING (FEET)	EASTING (FEET)	ELEVATION (FEET)
RF 1	45659.81	41232.67	7791.10
RF 2	45562.48	41234.29	7786.54
RF 3	45486.21	41199.27	7785.81
RF 4	45398.66	41143.49	7781.40
RF 5	45315.26	41087.44	7775.96
RF 6	45217.64	41054.02	7772.24
RF 7	45153.51	40945.84	7766.74
RF 8	45061.46	40904.94	7764.42
RF 9	44956.79	40868.03	7761.89
RF 10	44870.99	40801.72	7761.92
RF 11	44782.16	40777.38	7757.92
RF 12	44634.05	40738.25	7740.20
RF 13	44508.68	40706.73	7745.98
RF 14	44433.85	40622.93	7736.59
RF 15	44331.63	40507.23	7726.44
RF 16	44264.81	40442.14	7724.27
RF 17	44216.22	40336.61	7726.75
RF 18	44150.10	40292.26	7719.17
RF 19	44065.21	40210.72	7716.58
RF 20	43939.23	40097.47	7706.35
RF 21	43863.42	40028.09	7704.28
RF 22	43786.13	39946.17	7703.06
RF 23	43723.85	39841.32	7702.95
RF 24	43647.34	39781.38	7702.06
RF 25	43559.69	39727.08	7695.23
RF 26	43488.54	39640.90	7689.57
RF 27	43413.36	39596.08	7686.02
RF 28	43320.94	39521.68	7678.12
RF 29	43252.64	39457.23	7676.82
RF 30	43152.28	39401.82	7674.47
RF 31	43080.85	39360.31	7667.94
RF 32	43008.55	39304.45	7670.26
RF 33	42827.60	39226.44	7670.85
RF 34	42711.18	39250.81	7666.31
RF 35	42596.13	39207.73	7663.53
RF 36	42570.31	39103.58	7662.47
RF 37	42452.88	38978.21	7655.94
RF 38	42380.30	38944.86	7646.66
RF 39	42291.93	38885.24	7646.27
RF 40	42196.21	38841.77	7647.09
RF 41	42092.94	38813.43	7644.11
RF 42	42060.94	38755.40	7646.32
RF 43	41931.63	38693.07	7637.34
RF 44	41802.80	38658.27	7630.26

WARE SURVEYING & ENGINEERING

G.P.S. & CONVENTIONAL SURVEYING - AUTOCAD MAPPING - CIVIL ENGINEERING

CHAPTER 7.....REPLACEMENT PAGES

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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MAP 7-5	Seep/Spring Survey Map	1"=1000'
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CHAPTER 7
R645-301-700 HYDROLOGY

Historical Note: In the spring of 2009, and again in the summer of 2010, the company constructed small catchment structures in the C Canyon drainage below the minesite. The purpose of these structures was to contain coal-fines which had accumulated in the drainage channel as a result of non-compliance discharge water from the mine, and to assist in the subsequent clean-up project. Please refer to Appendix 5-15 for a complete description of these catchment structures, including history, location, right-of-entry, as-built design, operational criteria, and reclamation information.

Historical Note 2: In the summer of 2011 the company acquired a modification of federal lease UTU-78562 along the eastern side of the permit area. Mining in this new lease will involve development mining under the stream in the Right Fork of Whitmore Canyon which supplies most of the water to the Grassy Trail Reservoir. Due to concerns for the water rights in this area the company has agreed to collecting additional hydrologic baseline data. This data acquisition will include, but is not limited to the following:

a) Installation and/or rehabilitation of measuring flumes in the upper and lower reaches of both Right and Left Forks of Whitmore Canyon above the reservoir (total of 4ea. flumes).

b) Installation of measuring/recording devices at each flume, within the normal operating flow limits of the flumes.

c) Installation of subsidence monitoring stations at 100' intervals along the bottom of the Right Fork drainage within the permit area.

d) Installation of flow meters within the underground mine water collection/pumping system sufficient to adequately assess the quantity and location of groundwater sources encountered in the mine works in the vicinity of the Right Fork.

e) On-site location and development of selected springs in the Right Fork area subject to future monitoring, conducted in conjunction with stakeholder input.

f) Expansion of the seep and spring survey in the Right Fork to include more of the upper drainage area above longwall Panel #22.

g) Completion of a detailed gain-loss analysis of the stream flow in the Right Fork within the area of proposed development mining.

It should be noted that there will be no longwall mining under (beneath) the Right Fork of Whitmore Canyon, nor any other mining that would result in subsidence under the drainage of the Right Fork. The only mining under the Right Fork will be a limited number of development entries associated with the longwall bleeder system. All such development mining associated with Panel #22 will be conducted at depths in excess of 2600' below the Right Fork drainage.

Information regarding the subsidence monitoring points in the Right Fork can be found in Appendix 5-18.

Information regarding the underground (in-mine) flow meters can be found in Appendix 7-16.

Information regarding the expanded seep and spring survey can be found in Appendix 7-6B.

Information regarding the gain-loss analysis of the Right Fork can be found in Appendix 7-15.

R645-301-711 General Requirements

This chapter includes a description of hydrology and hydrogeology of the West Ridge permit area. Specifically, this permit application includes:

711.100 Existing hydrologic resources according to R645-301-720.

711.200 Proposed operations and potential impacts to the hydrologic balance according to R645-301-730.

711.300 The methods and calculations utilized to achieve compliance with the hydrologic design criteria and plans according to R645-301-740.

711.400 Applicable hydrologic performance standards according to R645-301-750.

711.500 Reclamation activities according to R645-301-760.

NOTE: The following discussion for the remainder of R645-301-711 applies specifically to the Gob Gas Vent Hole (GVH) installation proposed in Bear Canyon. In order to facilitate the review it is presented here in its entirety rather than interspersed throughout the chapter. A more detailed and complete discussion of the Bear Canyon GVH proposal can be found in Appendix 5-14. Unless specifically noted in this following discussion, nothing related to the Bear Canyon GVH proposal affects the contents of the existing approved MRP as described hereinafter.

The GVH site will be located on the opposite side of the road (southeast side) from the primary canyon drainage channel. Therefore, construction and operation of the GVH facility will have no affect on the natural canyon drainage. Because of the limited size of the site (0.24 acres) and the narrow configuration within the confines of the narrow ledges of the canyon, there is insufficient room to construct a sediment control pond. Therefore the company intends to employ a combination of alternate sediment control methods at the site. During the construction phase of the pad site, adequate rows of excelsior logs will be placed downgrade from the site to prevent construction sediment from entering the channel. Once the pad site is finished, which should take less than two weeks, a disturbed area drainage ditch will be constructed along the toe of the cut. This ditch will be designed to handle the flow from the up-slope undisturbed area, the reclaimed cutslope, the drillpad, and the adjacent section of road. This ditch will discharge into the natural drainage channel a short distance below the drillhole location. This ditch will be armored with adequately-sized rip-rap for its entire length. This rip-rap will decrease the potential for erosion in the ditch, and will also act initially as a siltation trap as a certain amount of sediment is allowed to settle into the rip-rap voids.

The total length of the drainage ditch will be approximately 350'. At 50' intervals along its length energy dissipaters will be installed in the ditch. These energy dissipaters will consist of excelsior logs laid in the ditch perpendicular to the flow direction, and anchored securely with stakes. These dissipaters will reduce the flow velocity to help reduce erosion, and will also serve as siltation filters to help remove sediment prior to reaching the natural channel. In addition, a terminal set of excelsior logs will be installed in the ditch immediately above the point where it discharges into the natural channel. The installation, consisting of four (4 ea.) closely-spaced rows of excelsior logs will serve primarily as sediment traps, rather than energy dissipaters. This set will be located conveniently close to the road to facilitate regular cleaning and maintenance. The sediment traps will be inspected routinely to make sure they are functioning properly. There will be mine personnel attending to the GVH units on a daily basis, and will be instructed to check the sediment traps on a regular basis, and especially after storm events. If they are in need of repair and/or cleaning such maintenance will be done immediately. Sediment cleaned from the traps will be hauled off-site and disposed of at an approved facility, such as the permitted Wildcat Loadout Coal Mine Refuse Disposal Site (DOGM permit C/007/033). All excelsior logs will be installed according to the manufacture's instructions.

Immediately after the cutslopes have been excavated to create the pad-site, the slopes will be pocked, and reseeded. A layer of woodstraw will then be spread over the reseeded slopes. This straw serves to not only provide microclimate conditions to encourage seed germination, it also absorbs some of the energy from falling raindrops, and therefore helps control erosion on the slopes until revegetation can become established. The pocking, which consists of irregular depressions measuring about 24" x 36" x 18" deep, helps revegetation by holding the seed and water in place, and thereby helps minimize erosion as well.

During the drilling phase of the GVH installation, the pad area will be used as an equipment lay-down area for drill steel, drill casing, drilling mud, concrete, etc. The pad will also be used to accommodate the mud pits needed during the drilling operation. The mud pit will measure approximately 30' long x 10' wide x 10' deep, and will be located immediately down-canyon, i.e., southwest of, the drillholes, as shown in Attachment 1. The pit will be lined with a 12 mil plastic liner, with a 20 mil felt underlayment. Based on the diameter and total combined length of the drillholes, and assuming a swell factor of 40% for the cuttings, the estimated volume of cuttings is 1283 cubic feet, or 47 yds. This would result in a total depth of cuttings remaining in the bottom of the pit of about 4.28 ft. After the drillholes have been completed the remaining cuttings will be mixed with native material until it can be handled with heavy machinery. It will then be removed from the pit and hauled off-site to an approved disposal facility. After the cuttings have been removed, the pit will be backfilled and eliminated. The site will then be cleaned up and fine-graded prior to installing the methane extractor

units (see Attachments 1 and 7 for details). A period of approximately two weeks will be required to construct the drillpad and to drill the holes. During this time interim sediment control will be provided by several rows of excelsior logs installed at the lower end of the construction site. Sediment is not expected to be a problem because of the short construction time involved (approx. 2 weeks), the low probability of rainfall events in late November at this elevation, and the temporary installation of the excelsior logs.

After the site has been constructed the entire operational pad area, as well as the adjacent road area and turnaround, will be graveled from the channel crossing up to the end of the road . This gravel will consist of a crushed rock 1.5" x 0" road base material, laid down and then compacted to a tight surface. This graveled surface will also serve to reduce erosion on the pad (and adjacent road segment) and thereby decrease sedimentation to the natural drainage.

In summary, the site will be an alternate sediment control area. Sediment will be controlled by the following combination of treatment methods:

1) Armoring the entire length of the drainage ditch with rip-rap.

2) Installation of energy dissipaters within the ditch to slow the flow velocity.

3) Installation of set of sediment control excelsior logs in the ditch ahead of the discharge point.

4) Pocking and revegetating the cutslope, including a layer of protective wood straw.

5) Graveling the pad-site and adjacent roadway

Refer to the site plan in Attachment 1 of Appendix 5-14 for the location of the drainage ditch, energy dissipaters, excelsior log siltation controls, and graveled area. See Attachment 11 of Appendix 5-14 for the drainage control calculations determined by Blackhawk Engineering. This report concludes that with *"....installation of the proposed sediment and erosion controls, there should be no adverse effects to the surface hydrology of this area."*

The GVH installation and operation should have no adverse affect on ground-water hydrology. The GVH site is located close to the area where the depth of cover over the longwall panels is the shallowest within the permit area. As a result, this area has been an area of interest in previous MRP amendments, resulting in enhanced water monitoring and subsidence monitoring requirements both above and below the GVH site. A more detailed discussion of the area hydrology can be found in R645-301-322.100 and R645-301-738 of the approved

MRP. It should be noted that this area has been now been completely undermined since November, 2006, subsidence has stabilized, and no adverse affects to underground or surface hydrologic resources have been observed. Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations, as discussed in the Chapter 5 section of Appendix 5-14. See Attachment 10 of Appendix 5-14, prepared by Petersen Hydrologic, for a discussion of the potential hydrologic affects from the GVH installation and operation. This report concludes that *"adverse impacts to the hydrologic balance resulting from the installation and operation of the Bear Canyon GVH system are not anticipated."* The probable hydrologic consequences (PHC) section of the MRP (645-301-738) has been updated to include a discussion of the Bear Canyon GVH installation.

During drilling operations, as well as during the remainder of the operational life of the GVH installation, noncoal mine waste will be stored in suitable containers, and then disposed of off-site at an approved waste disposal facility. Hydrocarbons, including Diesel fuel, gasoline, oil and grease, will be stored in the factory supplied containment mounted within the machinery. If any stand-alone storage tanks are used they will be equipped with built-in containment capable of holding the entire contents of the tank. Absorbent pads and bags of absorbent granules will be kept on hand during the drilling operation, and later during the GVH operation, to be used in case of a spill of oil, fuel or grease. Used absorbent material will be disposed of at an approved disposal facility. All operations will be subject to the current Spill Prevention Control and Countermeasure Plan (SPCC) for the West Ridge Mine currently on file with the Division, and included in Attachment 14 for ready reference.

Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations, as discussed in the Chapter 5 section above. Upon final reclamation, any portion of the gravel surface that is stained or contaminated in any way with hydrocarbons will be dug up and hauled off the site to an approved waste disposal facility. After removing any contaminated gravel, the pad area and cutslopes will then be backfilled to approximate original contour, using fill material obtained from the adjacent roadway and leveling pads, and covering up the diversion ditch and the remaining gravel in the process. The slopes will then be re-topsoiled. The surface will then be pocked and re-seeded with an approved seed mix as described in the Chapter 2 discussion. A layer of wood straw will also be spread over the reclaimed slopes to help minimize erosion, and promote vegetation growth. After the reclaimed slopes have been topsoiled and reseeded, a row of excelsior logs will be installed along the full length of the toe of the slope between the slope and the remaining road, as shown on the Reclamation Plan, Attachment 1. The purpose of this row of excelsior logs is to control sediment off the site until the revegetation has become established. These sediment control logs will remain in place until vegetation has been established adequate for Phase 2 bond release.

R645-301-712 Certification

All cross sections, maps, and plans have been prepared per R645-301-512.

R645-301-713 Inspection

Impoundments will be inspected as described under R645-301-514.300.

R645-301-720 Environmental Description

R645-301-721 General Requirements

The existing, pre-mining hydrologic resources within the permit and adjacent areas that may be affected by coal mining and reclamation operations are described by Mayo and Associates (1997; 7-1 "Groundwater Investigation of Proposed Mine Permit Area", 2001; 7-1A "Investigation of Surface-Water and Groundwater Systems in the Whitmore LBA Area") and summarized below.

Groundwater Resources

A spring and seep survey of the West Ridge area was conducted in 1985-86 by Kaiser Coal Corporation (1986) as shown in Appendix 7-6. Additional seep and spring survey data from the northeastern part of the project area was collected later in 1999 and 2010, as shown in Appendix 7-6A. Locations of the springs and seeps in this area are shown on Map 7-6 "Hydrologic Monitoring Map (Historical Monitoring Locations)". No water supply wells exist in the permit and adjacent areas.

Within the permit and adjacent areas, groundwater naturally discharges from alluvium and colluvium, and the Colton, North Horn, and Price River Formations. Over 90% of springs in the permit and adjacent areas issue either from alluvium/colluvium or the Colton and North Horn Formations, which form the caprock of nearly the entire permit area. Springs that issue from the Price River Formation are uncommon. Groundwater does not naturally discharge from the Castlegate and Blackhawk Formations within the permit and adjacent areas. However, groundwater occurs in some permeable horizons of the Blackhawk Formation. Most notably, groundwater is present in well DH86-2, which is open to the entire thickness of the Sunnyside Sandstone member of the Blackhawk Formation.

Springs that discharge from alluvium and colluvium and the Colton and North Horn Formations on the east slope of West Ridge in Whitmore Canyon contribute base flow to Grassy Trail Creek. Discharge from springs on the west side of West Ridge is small and is consumed by evapotranspiration and infiltration before reaching perennial streams.

Surface Water Resources

The mine permit area drains into Grassy Trail Creek via two principal drainages. The region east of West Ridge and west of Patmos Ridge drains into Grassy Trail Creek through Whitmore Canyon. Numerous small ephemeral creeks drain the western face of West Ridge and flow westward toward lower Grassy Trail Creek. Grassy Trail Creek ultimately discharges into the Price River near Woodside, Utah, approximately 20 miles to the south.

R645-301-722 Cross Sections and Maps

722.100 As described by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A), groundwater systems in the permit and adjacent area have limited areal and vertical extent due to the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata. No aquifers exist in the permit and adjacent areas. Therefore, no map has been prepared to show the location and extent of subsurface water.

722.200 The location of surface water bodies can be found on Map 7-3 "Water Rights", which shows Grassy Trail Reservoir and its location with respect to the permit area.

722.300 Baseline monitoring stations are shown on Map 7-6 "Hydrologic Monitoring Map (Historical Monitoring Locations)". This map shows the stations that were utilized to collect historical baseline information in earlier monitoring programs conducted between 1985 and 1996.

722.400 The location of water wells is also shown on Map 7-6. DH 86-2 was monitored during 1986, 1987, 1997 and 1998.

722.500 Map 5-1 shows contours of the proposed disturbed mineyard area.

R645-301-723 Sampling and Analysis

Water quality sampling and analyses have been and will be conducted according to the "Standard Methods for the Examination of Water and Wastewater" or EPA methods listed in 40 CFR Parts 136 and 434. Laboratory reporting sheets indicate the specific method used for each parameter.

R645-301-724 Baseline Information

Baseline groundwater, surface water, geologic, and climatologic data are described by Mayo and Associates (1997; 7-1, 2001; 7-1A).

724.100 Groundwater Information

The location of wells and springs are shown on Map 7-5, Seep/Spring Survey Map, and 7-6, Hydrologic Monitoring Map (Historical Monitoring Locations). Groundwater rights in and around the permit and adjacent areas are shown on Map 7-3 and tabulated in 7-5 "Water Rights Summary".

Kaiser Coal Company (a previous owner of the WEST RIDGE lease area) had identified and proposed monitoring for several other springs in the region. Review of their 1986 permit application to DOGM was interrupted by the sale of the coal leases to BP America in 1987. BP America retained JBR Consultants to proceed with baseline water monitoring. JBR Consultants renumbered previously monitored points into a different numbering system. In places of this WEST RIDGE Permit Application Package (such as Appendix 7-1, Table A-1) a cross-reference is made between the previous (Kaiser) spring numbers and the present (JBR) labels. Mining plans for both Kaiser Coal and BP America included a larger mining area. When WEST RIDGE acquired the property they did not acquire a portion of the coal lease area referred to as the north area. Therefore, in the WEST RIDGE PAP, those monitoring points that were north of Bear Canyon were eliminated from the baseline monitoring plan due to their distance from the current proposed mine workings and the low potential to be impacted by mining operations.

SP-1, SP-2 and SP-3 were spring monitoring points used by Kaiser Coal during the mid-1980's. These three points were located in Rock Canyon, several miles to the north of the WEST RIDGE permit area. They were eliminated from the monitoring program because they are quite a distance from the permit area and would not be affected by the WEST RIDGE mining operations.

Also, SP-4 and SP-5 (referred to in the Kaiser plan as S-40 and S-39) were eliminated from the monitoring plan because they occur about a mile north of Bear Canyon and are separated from the proposed mining area by several large drainages. The likelihood of impact to these sites is negligible since WEST RIDGE did not acquire coal leases in this area. SP-4 and SP-5 were monitored in 1988 and 1989 and found to be dry. These sites have been added to Map 7-6 for reference to historical monitoring locations.

SP-7 (Kaiser point S-22) is located about ½ mile north of the permit area. It was not included in the baseline monitoring program because access is poor and, during previous monitoring in the spring of 1986, flows were low (1-3 gpm). When this site was re-checked in 1988, 1989 and the fall of 1997 no flow could be found in the vicinity of the old spring. SP-10 (Kaiser S-1) is in the lower right-hand corner of the permit area was also eliminated from the baseline monitoring plan because of difficulty of access and low previous flow measurements. This site was also revisited in 1988, 1989 and 1997 and no flow or dampness could be located. No water rights exist on SP-4, SP-5, SP-7 or SP-10. SP-7 and SP-10 are included on Map 7-6 for reference to historical points.

Seasonal quality and quantity of groundwater and usage is described in the 1985-86 spring and seep survey (Appendix 7-6) and WEST RIDGE Resources, Inc.'s baseline monitoring during 1997 (Appendix 7-2 "Baseline Ground Water Monitoring & Analyses"). These data have been analyzed by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A).

Drill Hole 90-1

DH90-1 was developed as a water supply well by Sunnyside Coal Company, East Carbon City, and Sunnside City. Sunnside City and East Carbon City have a water right (91-4960) for 31.621 ac-ft per year (19.6 gpm) from this well.

Information for the state engineer's office in Price (Mark Page, Personnal Communication) indicates that the well has a total depth of 500 feet. The well has a gravel pack from 207 to 500 feet below ground surface. According to Sunnyside Coal Company (1993), the well is completed in the Price River and North Horn Formations.

Because the well is located two thirds of a mile from the lease boundary, and is completed in the Price River and North Horn Formations, it is very unlikely that mining in the permit area will affect groundwater systems that contribute water to DH90-1.

A spring and seep survey was performed by Petersen Hydrologic, LLC in the Right Fork of Whitmore Canyon drainage. The survey area encompasses portions of Sections 31 and 32, Township 13 South, Range 14 East, and Sections 5 and 6, Township 14 South, Range 14 East. The report of this spring and seep survey is provided in Appendix 7-6B.

Based on records of the Utah Division of Water Rights, there are no water rights associated with any of the springs or seeps located in the Right Fork of Whitmore Canyon within the permit area, although there are several stockwatering rights for surface water in the bottom of the drainage. Within the adjacent area outside the permit area the August, 2011 spring and seep survey (Appendix 7-6B) identified two springs which appear to have been developed in the past for livestock use. These are identified as RFS-6 and RFS-11. Neither of these springs have an associated water right. Upon further investigation it has been determined that RFS-11 is the same spring as the Section 5 Spring (see Map 7-7) which was previously identified by the stakeholders as one of the springs which should be monitored and which is now included in the company's operational water monitoring plan. Even though none of the springs within the permit area in the Right Fork have assigned water rights, based on discussions with Marc Stilson of the Utah Division of Water Rights, Price field office (December, 2011), all water in the Right Fork of Whitmore Canyon is appropriated (see Appendix 7-17).

724.200 Surface Water Information

The location of streams, reservoirs, and stock watering ponds are shown on Map 4-1. Surface water rights in and around the permit and adjacent area are shown on Map 7-3 and tabulated in Appendix 7-5 "Water Rights Summary".

WEST RIDGE Resources, Inc. anticipates that as mining progresses, it may become necessary to discharge water from the proposed mine. Mine water will be discharged to the ephemeral drainage in C Canyon. The location of the mine discharge point is shown on Maps 5-5 and 7-2, Mine Site Drainage Map.

Surface water quality and quantity is shown in WEST RIDGE Resources, Inc.'s baseline monitoring data (Appendix 7-3 "Baseline Surface Water Monitoring & Analyses") and is described in detail by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A). Additional surface and groundwater baseline data has been added to Appendix 7-1, Table A-1. Monitoring records from Kaiser Coal Company have been located and added to the data base. This includes monitoring of surface sites on ephemeral drainages around the area.

As described in R645-301-728.320, no acid drainage is expected from the proposed mining operation.

Upper Grassy Trail Creek Drainage

Most of the surface water flowing into Grassy Trail Creek in Whitmore Canyon above Sunnyside discharges from several ephemeral streams located on the western slopes Patmos Ridge (1998 Mayo and Associates report, Figure 15). These streams include Number Two Canyon, Pasture Canyon, Pole Canyon. Bear Canyon, Water Canyon, the Right and Left Forks of Whitmore Canyon, Graveyard Canyon, Hanging Rock Canyon, and Spring Canyon. No major streams flow into Grassy Trail Creek in Whitmore Canyon from the eastern slope of West Ridge due to the asymmetry of the ridge. Discharge in Grassy Trail Creek in Whitmore Canyon is regulated at Grassy Trail Reservoir.

Side tributaries to Grassy Trail Creek along the western slope of Patmos Ridge are characterized by steep gradients (greater than 25%), narrow canyons, and gravel streambeds with sand and silt where gradients are reduced. Tributary flow is intermittent and in response to precipitation events.

Above the reservoir, Grassy Trail Creek lies in a relatively broad canyon (30 to 100 yards wide) with a low gradient (3 to 4%). The channel bottom locally consists of boulders, gravel, sand, or mud. The Right and Left Forks of Grassy Trail Creek lie in narrow canyons with steep gradients. The Utah Supreme Court has determined that Grassy Trail Creek is an intermittent stream (Decree #3028). During wet periods, base flow above the reservoir is sustained by high elevation springs, mostly in the Colton Formation. During dry years, there is no sustaining groundwater baseflow to support flow in the creek. Below the reservoir Grassy Trail Creek is now a perennial stream due to the buffering effect of the reservoir.

Monitoring stations on Grassy Trail Creek have been established at ST-3, which is above Grassy Trail Reservoir near Hanging Rock Canyon, and below the reservoir at ST-8 near the confluence with Water Canyon (Mayo and Associates 1998 report, Figure 16). During May, June, August, and October of 1997, Andalex made stream flow measurements at these locations. On average, discharge between ST-3 and ST-8 increases by about 200 gpm during this time. In June, However, flow increased between these two stations by 1,700 gpm. We suspect that this increase is the result of surface water inflows from ephemeral side drainages during the snowmelt period.

Visual observations during low-flow stream conditions suggest significant base flow gains in the reach between the reservoir and the mouth of Whitmore Canyon. Mayo and Associates observed Grassy Trail Creek between the confluence with Water Canyon and the mouth of Whitmore Canyon on 21 November 1997. The results of the observations are presented below.

Location	Discharge (gpm)
Confluence with Water Canyon	150[1]
Base of Blue Gate Sandstone	298
Mouth of Whitmore Canyon	275[1]

[1] Estimated values; the channel was frozen over and measurements were not possible.

Discharge in Grassy Trail Creek doubled in the reach from the confluence with Water Canyon (alluvium overlying North Horn Formation) to the base of the Bluecastle Member of the Price River Formation. Much of the increase comes from several small springs and seeps, which visibly discharge from the stream bank into the creek. In the reach from below the Bluecastle Member to the mouth of Whitmore Canyon flow remained relatively constant. Most of the increase in flow occurs as the stream flows over alluvial and colluvial deposits. The canyon widens substantially in this reach and the alluvial deposits appear to be thicker than in the higher elevations in the canyon. The increase in stream flow is likely the result of delayed drainage from the alluvial and colluvial deposits. However, it is possible, though less likely, that the increase in flow is the result of groundwater leakage from permeable sandstone horizons in the Price River Formation.

No increase in discharge in Grassy Trail Creek is observed as the creek flows over the Blackhawk Formation near the mouth of the canyon. This suggests that there is no appreciable discharge from the Blackhawk Formation to the creek. This finding is in agreement with many other stream gain-loss measurements performed by Mayo and Associates in the Book Cliffs and Wasatch Plateau coal fields.

In the mouth of Whitmore Canyon, streamflow in Grassy Trail Creek is lost to the alluvial sediments associated with the Mancos Shale. Waddell (1981) reports that the composition of groundwater in the alluvium near the mouth of Whitmore Canyon in Whitmore Spring (D-15-13)1ddc-S1 and well (D-15-13)2 dad-1 have solute compositions and TDS concentrations that are similar to those in lower Grassy Trail Creek. This suggests that the creek and the thick alluvial deposits in the mouth of the canyon are probably in good hydraulic connection. Several springs with discharges of less than 10 gpm discharge from the alluvium near the mouth of the canyon. These springs are likely recharged from leakage from Grassy Trail Creek. During dry periods, Grassy Trail Creek dries up completely before reaching the confluence with Bear Creek and Rock Canyon Creeks west of the permit area. The reduction of flow in the creek in this reach is due primarily to infiltration into the thick alluvium and to losses to evapotranspiration.

Water Rights

Water rights on Grassy Trail Creek are shown on Map 7-3 and tabulated in Table 7-5.

Water Quality

Surface water in upper Grassy Trail Creek is of the magnesium-calcium-bicarbonate type with considerable concentrations of sodium and sulfate. Average TDS concentrations are approximately 350 mg/l at ST-3 and 277 mg/l at ST-8. Below the confluence with Water Canyon Creek, the TDS and chemical character of Grassy Trail Creek changes. The TDS steadily increases to about 1,000 mg/l. Na^+ becomes the dominant cation and there are also substantial increases in SO_4^{2-} and HCO_3^-.

Bear Canyon Drainage

Flow Characteristics

The discharge from the Bear Canyon drainage (which is tributary to Dugout Creek) is described as ephemeral in the Mayo and Associates report (p. 53). However, historical monitoring location ST-2 in the left fork of Bear Canyon is considered an intermittent stream monitoring site (Mayo and Associates report, page 52).

Flow in the upper reach of the left fork of Bear Canyon is intermittent for about 500 feet. Water in this upper reach is supported by intermittent discharge from a spring complex (including historical monitoring location SP-6). Intermittent flow is not sustained below this stretch of the drainage due to infiltration and therefore does not reach the LBA boundary.

Data from monitoring sites ST-4 and M-2 indicate that discharge from the Bear Canyon drainage is ephemeral. In May 1988, no flow was observed at M-2 (refer to Table A-1). The PHDI (Figure 3a and 3b) indicates that 1988 was not a drought year. No flow was observed at ST-4 during 1989; however, this year was the beginning of a drought period in the region. At ST-4, no flow was observed in the drainage in March, May, June, July, August or September 1997, or May, June, July, August or September 1998.

M-1 (ST-1) was a monitoring point used by Kaiser Coal during the mid-1980's. The point was identified as M-1 by Kaiser Coal in their 1986 permit application package. It was later redesignated as ST-1 by JBR Consultants in a monitoring plan later submitted for BP America. This point was located in Rock Canyon (approximately 2 miles to the northwest of the WEST RIDGE permit area in T. 13 S. R 13 E. Section 32 NW1/4 SW1/4 on Rock Creek. When WEST RIDGE (Andalex) took over the monitoring program in 1997, they decided to utilize the same numerical designations of the monitoring points to minimize confusion over numbering and to maintain continuity in the baseline monitoring plan and facilitate utilization of previously collected hydrology information. Rock Creek was not included in the baseline monitoring plan for the WEST RIDGE mine because of the distance from the lease area and the low potential for mining operations to have any impacts. However, rather than renumbering the stations and causing confusion, it was decided to leave the existing numbering scheme in place but sample only those site important to the current mining proposal. The WEST RIDGE monitoring program does not include ST-1 and this point is not shown on the operational monitoring map (Map 7-7).

Water Rights

Surface water rights (91-1717 and 91-1722) for the intermittent reach of the left fork of Bear Creek have a period of use of March 15 to October 31. Data from ST-2 indicate that water is available in the upper left fork during this period in normal to wet years. During dry years, this stretch is dry.

All other surface water rights for Bear Creek below the intermittent reach have a year-round period of use. However, as discussed above, all of Bear Creek below the headwaters of the upper left fork only supports ephemeral flow.

Water Quality

Surface water at ST-2 is a Mg^{2+}-HCO^{-}_{3}-SO_4^{2-} type water with elevated TDS (1,100 mg/l) relative to surface water in upper Grassy Trail Creek. Only one surface water sample has been collected at the ephemeral monitoring location M-2. This water had a TDS of 1,820 mg/l indicating that the quality of water naturally degrades between ST-2 and M-2.

Hydrologic Resources of the Topsoil Borrow Area

The 9.6 acre area identified as the topsoil borrow site is a gently, westward sloping bench. The surface is covered with sagebrush and pinyon juniper. No seeps or springs exist in or around the borrow site. What little surface runoff occurs would flow to ephemeral drainages downstream from the borrow site. Surface runoff is minimized by the vegetative cover and relatively deep soil horizons in this area. Due to the limited areal extent of the borrow area, it does not appear to contribute a significant amount of runoff to adjacent drainages. There are no known aquifers in this area that would be recharged by this watershed area.

During reclamation, if it is determined that topsoil resources from this potential borrow site are needed to achieve reclamation of the mine site, silt fencing would be placed around the outer limits of the borrow area to be disturbed. Topsoil would be stripped and stockpiled. The required amount of topsoil would then be removed from the borrow site. Care would be taken to contour the borrow pit such that runoff would be utilized to the fullest extent in the disturbed area. This would include gouging the regraded surface with pits approximately 24" wide, 36" long and 18" deep as well as sloping the regraded slopes inward to encourage precipitation infiltration on-site.

724.300 Geologic Information

Geologic information in sufficient detail to determine the probable hydrologic consequences of mining and determine whether reclamation can be accomplished, as required by R645, is provided in Chapter 6 of this permit application package and in Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A).

724.400 Climatological Information

724.411 Seasonal precipitation

Average annual precipitation at Sunnyside is 13.3 inches (NCDC, 1997) while estimated potential evaporation is over 60 inches (Sunnyside Coal Company, 1993). Mean monthly precipitation at Sunnyside is shown on Figure 7-1 "Hydrologic Monitoring Protocols and Locations". On average, the area receives the greatest quantity of moisture in the late summer and early fall (August-October). The driest months are November to February.

The precipitation and temperature data described above is typical of the lowland areas at the base of the Book Cliffs. Although data are not available for the higher elevations of the permit area, average precipitation likely increases and average temperatures likely decreases with elevation.

The Palmer Hydrologic Drought Index (PHDI; NCDC, 1997; Karl, 1986; Guttman, 1991) indicates long-term climatic trends for the region. The PHDI is a monthly value generated by the National Climatic Data Center (NCDC) 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 for evaluating the long-term relationship between climate and groundwater recharge and discharge. Figures 7-2 Palmer Hydrologic Drought Index for Utah Division 6 and 7-3 Palmer Hydrologic Drought Index for Utah Division 7 show the PHDI for Utah Division 6 (Uintah Basin) and Division 7 (Southeastern Utah), respectively. The permit area lies at the boundary of these two regions. These graphs indicate extremely wet years between the early and late 1980s, followed by several years of drought in the late 1980s and early 1990s. Since about 1993, wet and dry cycles have been shorter.

724.412 Winds direction and velocity

Wind data have been collected by SCA (Sunnyside Cogeneration Associates) during 1982 and 1983 for permitting of the power plant. These data (Sunnyside Coal Company, 1993) were collected in Dragerton (near East Carbon, Utah) atop a 45-meter tower. The data show that the majority of the winds are from the north-northeast clockwise through the south-southwest. The average annual wind speed is 6.2 mph.

Upper level winds, over 1,600 feet above the ground level, are generally from the southwest during most of the year. During the winter, air flow from the northeast is common. Local airflow patterns are primarily influenced by stream and river drainages. Wind speeds induced by the descent of dense cold air is generally light. The daytime flow is strongly influenced by surface heating effects which result in mixing between surface and upper level flows. In the permit area there is a general air flow toward the north and northeast during the day (high elevations) and toward the southwest (lower elevation) during the night. Wind speeds are usually light to moderate (below 20 mph). Higher wind speeds are generally associated with storm systems and higher elevations such as ridge tops.

724.413 Seasonal temperature ranges

Temperatures in the permit area vary greatly both daily and seasonally. Temperature data collected at the Sunnyside Mine engineering office (Sunnyside Coal Company, 1993) indicate that average temperatures are generally below freezing in the winter months and summertime temperatures range from 50 - 90°F.

724.500 Supplemental Information

Adverse impacts to the hydrologic balance either on or off the permit area are not expected to occur based on the probable hydrologic consequences determination in R645-301-728. Acid- and toxic-forming materials present in mining materials will not cause contamination of groundwater or surface-water supplies. Consequently, information regarding remedial and reclamation activities has not been prepared.

724.600 Renewable resource lands

Aquifers or areas for the recharge of aquifers do not exist within the permit and adjacent areas. As described by Mayo and Associates (1997; Appendix 7-1), groundwater systems in the permit and adjacent area have limited areal and vertical extent due to the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata.

Limited groundwater recharge occurs on the land surface within the permit area because of the steep slopes and cliffs. Springs that discharge in the permit area are most likely associated with shallow alluvial and colluvial materials. Mining should not affect the recharge or discharge of these springs. Groundwater recharge to the Colton and North Horn Formations within the permit area may discharge as springs in Whitmore Canyon because of the northeasterly dip of the rocks. Due to abundant claystone and mudstone in these formations and the thickness of the interburden between these formations and the mining horizon, mining will not impact groundwater in these horizons.

Adjacent to the permit area, the upper slopes of the east side of West Ridge are the recharge area for Colton Formation groundwater systems that discharge as springs in Whitmore Canyon and contribute base flow to Grassy Trail Creek. These groundwater systems occur in the shallow subsurface and will not be undermined. Mining will have no impact on the recharge and discharge of these springs.

724.700 Not applicable.

R645-301-725 Baseline Cumulative Impact Area Information

Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A) have analyzed geologic and hydrologic information and prepared a document describing the surface-water and groundwater systems of the permit and adjacent areas. This report contains the information to assess the probable cumulative hydrologic impacts of coal mining and reclamation operations as required by R645-301-729.

The hydrology and geology of the area around Grassy Trail reservoir is discussed in a seismic analysis report (see Appendix 5-11) and the Phase II dam safety report (see Appendix 5-12). These reports conclude that it is unlikely that mining induced seismicity or subsidence will impact the performance of the Grassy Trail Dam and Reservoir. Based on the conclusion of this study the BLM has approved the R2P2 to allow full extraction longwall mining of Panel #7. BLM also added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, *"The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease."*

Based on BLM's approval the company then successfully mined longwall panel 7 from December, 2005 through September, 2006. Soon thereafter, RB&G Engineering prepared a summary post-mining report on the mining related affects on the reservoir (see Appendix 5-16). Still later, in 2010, RB7G Engineering prepared an additional update to the summary report (see Appendix 5-17). Based on these reports, BLM has recently approved the R2P2 to allow additional longwall mining of panel block 18-20 on the east side of the mains in the vicinity of (i.e., west and north of) Grassy Trail reservoir (see Appendix 5-3C). This new approval

contains the same lease stipulation #17, as with the previous approval of panel 7.

R645-301-726 Modeling

No numerical models have been created for the permit area.

R645-301-727 Alternative Water Source Information

The determination of the probable hydrologic consequences (R645-301-728) indicates that the proposed coal mining activities will not result in the contamination, diminution, or interruption of groundwater or surface-water sources within the proposed or adjacent areas. Therefore, WEST RIDGE Resources, Inc. has not prepared information regarding alternative water sources.

R645-301-728 Probable Hydrologic Consequences (PHC) Determination

This section describes the probable hydrologic consequences (PHC) of underground coal mining in the permit area. This determination is based on the data and information presented previously in this chapter and by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A). The PHC will be updated, if needed, following the collection and analyses of information gathered during the 1998 field season.

In association with the proposed mining in the Panel 22 extension area, additional hydrologic data have been collected and analyzed. A supplemental spring and seep survey was performed in the Panel 22 area by Petersen Hydrologic, LLC (See Appendix 7-6b). A stream gain/loss investigation was also performed in the Right Fork of Whitmore Canyon by Petersen Hydrologic, LLC (see Appendix 7-14). Permanently installed Parshall flumes were installed/rehabilitated in the Right Fork of Grassy Trail Creek both above and below proposed mining areas. Baseline streamflow information from the Right Fork of Grassy Trail Creek is included in Appendix 7-14.

728.310 Potential adverse impacts to the hydrologic balance

Longwall coal mining may result in land subsidence and bedrock fracturing. Subsidence and fracturing have the potential to impact the hydrologic balance if fracturing increases the vertical hydraulic conductivity of overburden rock. Possible consequences of fracturing include decreasing discharge rates of near-surface groundwater while increasing the recharge rates of deeper groundwater systems.

Mining will occur in the Lower Sunnyside Seam of the Blackhawk Formation. Over 90% of the springs in the West Ridge area discharge from near-surface groundwater systems in alluvial/colluvial materials and the Colton and North Horn Formations. The thick interburden between the mined horizon and the near-surface groundwater systems

and the presence of swelling clays in the North Horn Formation will prevent fracturing and subsidence from increasing vertical hydraulic conductivities and decreasing spring discharge rates.

Groundwater that is encountered by mining operations will likely be old, meaning that recharge occurred thousands of years in the past. Well DH86-2 encountered water in the Sunnyside Sandstone below the coal seam to be mined. This water has a radiocarbon age in excess of 11,000 years.

Groundwater systems encountered in the Blackhawk Formation occur in isolated sandstone paleochannels, fractures, and faults. These groundwater systems are not in active hydraulic communication with the surface and have limited areal and vertical extent. Mining could dewater some of these systems if they are intercepted during mining operations. Because of the limited spatial extent of these systems, discharge from these isolated groundwater systems will cease soon after interception by mine workings.

Groundwater discharging from the mine roof from a sandstone paleochannel into the West Ridge Mine workings was sampled for carbon-14 and tritium content on 24 October 2000 (Main Dips Belt XC21). The tritium content of this sample was very low (0.17 tritium units), which is near the lower laboratory detection limit. This indicates that the water sampled in the mine has been isolated from the land surface for at least the past 50 years. The result of the carbon-14 analysis indicates a radiocarbon content of 2.28 percent modern carbon. This is suggestive of very old groundwater. However, because of uncertainties in the characterization of the carbon history of the water (based on the positive carbon-13 composition), the calculation of a groundwater "age" is not possible. The antiquity of the water encountered underground at the West Ridge Mine demonstrates the lack of appreciable hydraulic communication with shallow groundwater systems and recharge sources. This condition is consistent with conditions encountered at coal mines elsewhere in the Book Cliffs and Wasatch Plateau coal mining districts of Utah.

Mining could also encounter water impounded in the old Sunnyside mine workings. In order to avoid accidentally mining into flooded workings, the West Ridge mine will perform exploratory drilling ahead of development when active mine works are within 500 feet of the projected Sunnyside workings. Face drills will be used to drill at least 100 feet out in advance of the actual mine face development. The exploratory face drill will be a small diameter and if water is encountered from the old works the drill hole can easily be plugged and sealed. The West Ridge mine plan assumes that development will proceed to within 300 feet of the old works. West Ridge mine intends to stay away from the old works but will drill ahead as a precautionary measure in the event that the mine maps or surveying has a margin of error.

Based on the analysis of the probable hydrologic consequences (PHC), it has been concluded that it is highly unlikely that mining in the West Ridge area will result in the decrease of groundwater discharge rates.

Grassy Trail Creek above Grassy Trail Reservoir flows across the WEST RIDGE permit area. The stream channel in this area is underlain by approximately 2,000 feet of cover, which includes the entire thickness of relatively unfaulted and unfractured North Horn Formation, which is known to form an effective barrier to vertical groundwater migration (Mayo and Associates, 1998) and is known to contain hydrophillic clays that swell when wetted to seal any fractures that may form. Therefore, the potential for the interception and diminution of surface water flows in Grassy Trail Creek as a result of mining induced subsidence is minimal. Where differential subsidence may potentially occur beneath Grassy Trail Creek, such as along longwall panel ends or above gate roads, there is the potential for localized increases or decreases in stream gradients. These changes can result in minor changes to the stream morphology, including changes in the number of pools, runs, glides, etc. Differential subsidence of the channel substrate also has the potential to result in temporary increases or decreases in sediment yield. However, because a steep, mountain stream flowing on alluvial or soft bedrock substrate has the tendency to rapidly erode elevated areas and deposit sediment in lowered areas, these effects are commonly short-lived, as the stream system is rapidly brought back into equilibrium.

In order to assess the impacts of full extraction mining beneath perennial streams in the Utah Coal District, several comprehensive investigations of the Burnout Canyon drainage above Canyon Fuel's Skyline Mine have been conducted (Forest Sciences Laboratory, 1998; Sidel, 2000). The findings of these investigations indicated that 1) baseflow discharge rates during and after subsidence of the drainage were not statistically different at the 0.05 level, 2) there was no indication that water was lost from Burnout Creek as a result of longwall undermining of the drainage, and 3) some minor changes in stream morphology, including changes in the pool/riffle ratio of the stream channel were noted; however, similar changes in the study's control area (James Canyon) were also noted, indicating that the observed morphological changes could have been at least in part the result of non-mining-related factors. They found that the changes in channel morphology were generally short lived. Subsequent to the publication of these investigations, the Burnout Canyon drainage has been further subsided as a result of multiple seam extraction beneath the creek. No perceptible or quantifiable impacts to the drainage have been detected as a result of this mining activity (USFS, 2001).

Burnout Creek and upper Grassy Trail Creek, both being relatively steep-gradient mountain streams, are in many senses generally comparable. However, while overburden thicknesses in the Burnout Canyon area range from about 600 to 850 feet, overburden thicknesses beneath Grassy Trail Creek are approximately 2,000 feet. Therefore, it is reasonable to assume that the hydrologic impacts to upper Grassy Trail Creek, where only single seam extraction under significantly greater cover, will be

similar to (or lesser than) the minimal impacts experienced in the Burnout Canyon area.

For the reasons discussed above, it is believed that the impacts to Grassy Trail Creek above Grassy Trail Reservoir as a result of longwall mining beneath the creek will be negligible.

No mining is proposed beneath or within the angle of draw of Grassy Trail Reservoir. Therefore, the potential for loss of water from reservoir leakage is believed to be negligible.

Bear Canyon is situated in the northwest portion of the permit area within the SITLA lease area. This canyon is unique because it is within the right fork of this drainage that the cover over the longwall subsidence zone is the shallowest of anywhere in the entire permit area. In one part of the bottom of the (right fork) Bear Canyon drainage the cover over the longwall panes is approximately 325'. Due to the increased potential for the effects of subsidence to reach the surface in this area special attention has been focused on the hydrologic character of the Bear Canyon drainage.

Bear Canyon is typical of the canyons draining the southwest-facing front slopes of the Book Cliffs in this area. These canyons are generally shorter and drier than those drainages on the back-side of the Cliffs. Several baseline surveys of Bear Canyon right fork done in the late 1980's showed the drainage to be mostly dry and the canyon was identified as ephemeral along with other similar front-facing canyons in the permit area, such as "C" Canyon, "B" Canyon, and "A" Canyon. However, during site visits in June and July of 2005, substantial stream-flow was observed in the drainage. This occurrence of flow, along with the observation of riparian vegetation in the lower stretches of the canyon, has led to a re-evaluation of the classification of the drainage as intermittent. Also, because the area of the Bear Canyon watershed is greater than one square mile the drainage is classified as intermittent under DOGM regulations.

Historical observation of Bear Canyon shows the streamflow in the bottom of the drainage to be a combination of surface flow and subsurface flow. In those areas where bedrock is at or close to the surface, flow is forced up to the surface. In other areas where the alluvium in the channel is thick and porous the flow is subsurface and the stream channel is often dry. The stretches of channel exhibiting surface flow as opposed to subsurface flow will vary from season to season, and year to year depending on prior precipitation trends in the watershed. There are times when the entire length of the channel could be expected to exhibit surface flow, and other times when surface flow is confined to certain segments. And, according to past monitoring observations, there are often times when there is no flow in the stream channel. In order to better define the hydrologic character of the canyon WEST RIDGE Resources will expand the monitoring program in Bear Canyon by adding two new monitoring sites and relocating a third site (see Map 7-7 and Table 7-1).

As mentioned previously, there is a point in the right fork of Bear Canyon where cover over the longwall panel will be about 325' which is the shallowest surface cover of any place within the current WEST RIDGE mine plan. This, along with the fact that there are state-appropriated surface water rights in this drainage (refer to Appendix 7-5), makes this an area of special interest. There is reason to expect that full-extraction longwall mining will not adversely affect the hydrologic resources of the canyon in this area. According to Syd S. Peng, ("Coal Mine Ground Control", 1978, Wiley, New York) a general rule-of-thumb is that subsidence-related fractures can be expected for a distance above the coal seam equal to 50 times the mining height, which works out to be 316' for the shallow point in Bear Canyon, which is slightly less than the cover in that area. Therefore due to the shallowness of cover in this area there could be subsidence fractures which reach the surface in the bottom of the canyon, and mitigation will be done to protect the resource.

The shallow overburden point coincides with the inflection point of the longwall subsidence profile. Based on a 22 degree angle of draw the tension zone will extend along the surface from the inflection point (shallow point) downstream approximately 130'. Areas upstream from the inflection point will be in compression as the longwall panels are extracted in progression from the southwest to the northeast according to the approved mining plan. Cracks are more likely to open up in the tension zone as compared to the compression zone where lateral forces are pushing toward each other rater than pulling apart. As mining progresses to the northeast, cover increases rapidly because of the gradient of the channel bottom and the dip of the coal seam, and surface effects of subsidence should diminish in that direction. Therefore, it is expected that any cracking which might reach the surface should most likely appear in the canyon bottom in the 130' (plus/minus) tension zone down-canyon from the inflection point. Special subsidence monitoring will be focused on this area.

WEST RIDGE will establish two new hydrologic monitoring sites in the right fork of Bear Canyon. The first site (ST-11) will be located within the tension zone described above. This site was chosen because this location should be well-suited to determine if tension cracks have affected stream flow. It is also, coincidentally, one of the areas where the bedrock nature of the channel bottom forces water to the surface, thereby making streamflow measurements more accurate. The second site (ST-12) will be located about 2400' farther up-canyon in another area where, again, the bedrock nature of the channel allows for a more accurate streamflow measurement. A third monitoring site (ST-13) will be located below the forks of Bear Canyon just outside the permit area boundary. This site will replace the existing monitoring site ST-4.

During the flow season of 2005 and 2006 (that is, May 15 through September 15) site ST-11 will be monitored monthly as long as flow is present. This monthly

monitoring will help better define the nature of streamflow prior to longwall extraction in the area, which is presently scheduled for May, 2007. Thereafter, monitoring will be done on the regular quarterly basis. Site ST-12 is more inaccessible, and could be dangerous to reach in the winter. Therefore this site will be monitored twice a year, once during late spring/early summer (expected peak flow) and once in late summer/early fall, when the canyons are normally much drier. Site ST-13 will be monitored quarterly.

The longwall is presently scheduled to pass under Bear Canyon in the spring of 2007. Prior to that, WEST RIDGE will complete a survey of a series of subsidence monitoring points established up the bottom of the drainage on either side of the inflection point. After the longwall has passed under the drainage these points will be re-surveyed and an accurate account undermined WEST RIDGE will visually inspect the area to determine if any effects of subsidence are apparent. Within thirty days of the inspection WEST RIDGE will submit a written report to the Division outlining the results of this inspection .

Recent site visits have determined the existence of riparian type vegetation in the lower reaches of Bear Canyon below the forks. WEST RIDGE commits to preparing a detailed vegetation survey and mapping of the canyon bottom with emphasis on the existence of riparian specie. This survey will be conducted during the growing season of 2005 or 2006. The survey will be done in consultation with Division biologists and the completed report will be added to the Mining and Reclamation Plan as an appendix.

If it is determined that mining-related subsidence has adversely impacted the hydrologic resources of Bear Canyon, including and state-appropriated water rights, WEST RIDGE will mitigate the damage. The first option would be to seal any cracks with the application of bentonite clay. Bentonite sealing compounds are available commercially made specifically for such applications. If bentonite sealing proved ineffective, WEST RIDGE would propose the installation of piping to transport stream water across the fracture zone to continue the flow downstream. Any work done in the stream channel would most likely require the issuance of a channel alteration permit from the Utah Division of Water Rights.

Adverse impacts to the hydrologic balance resulting from the installation and operation of the Bear Canyon gob vent holes (GVH) are not anticipated. The basis for this conclusion is summarized below.

The gob vent holes will be constructed in a manner that minimizes the potential for adverse impacts to groundwater and surface-water resources and the hydrologic balance in the area. The proposed construction designs for the GVH holes include a nominal 20 foot length of 16-inch non-perforated steel surface casing that will be cemented in place. The surface casings will isolate the wells from surface-water, soil moisture, and any shallow groundwater potentially

present in the upper 20 feet and will prevent shallow water from entering the GVH wells. From approximately 20 to 200 feet below the surface, the proposed well construction plans call for the placement of 9.625-inch non-perforated steel casing that will be cemented into place. The cemented steel well casing will isolate groundwaters that may be present in bedrock groundwater systems in the upper 200 feet from the GVH wells and prevent the inflow of groundwater into the wells.

Proposed construction plans call for the lower approximately 150 feet of the GVH wells to be cased with 8.75-inch slotted steel casing that will be left open to the rock strata and will not be cemented. The purpose of the slotted steel casing is to allow the drainage of gob gasses into the well bore in the fractured rock strata overlying the Panel 8 gob. While there is the potential for drainage of some Blackhawk Formation groundwater into the GVH holes in the 150 feet interval overlying the longwall gob, the potential for appreciable or sustained groundwater drainage through these wells is minimal. This is because 1) groundwater systems in the Blackhawk Formation occur in hydraulically isolated groundwater partitions that are not in hydraulic communication with adjacent groundwater partitions, which limits the amount of groundwater that could potentially be drained, 2) the GVH holes are situated near the up-dip ends (outcrop locations) of the Castlegate Sandstone and Blackhawk Formation which limits groundwater recharge potential and the potential for the interception of regional groundwater systems, and 3) the 150-foot interval of the Blackhawk Formation overlying the gob area was likely intensely fractured as a result of the longwall mining prior to the construction of the wells which would likely have drained the groundwater partitions immediately overlying the gob area at the time of mining. For these reasons, the potential for drainage of appreciable groundwater or surface-water resources through the GVH drill holes is considered low.

The potential for detrimental impacts to the ephemeral Bear Canyon Creek drainage or any associated alluvial groundwater systems is considered remote. Appreciable baseflow alluvial groundwater systems were not identified near the GVH location during the 7 October 2008 site visit. Additionally, because the GVH well bores will be hydraulically isolated from the upper approximately 200 feet, the potential for impacts to water quality in the drainage are unlikely. The implementation of appropriate sediment control management practices will minimize the potential for increased sediment yield from the GVH site during the construction and operational phases of the GVH system.

Prior to final reclamation, the GVH drillholes will be plugged and sealed in accordance with State and Federal regulations. The casings will be plugged at the bottom to hold the concrete. A lean concrete mixture will be poured into the casing until the concrete is within five feet of the surface. At that time the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before final reclamation is

completed. In this manner, the potential for any long-term impacts to the hydrologic balance resulting from the GVH system will be minimized.

Spring Canyon is located in the northern part of the permit area in SITLA lease 44771. There are no state-appropriated water rights on this lease. (Refer to Appendix 7-5 for additional details.) The surface is privately owned by Penta Creek with whom WEST RIDGE maintains coal mining rights. Longwall mining in this area is not scheduled until the year 2014. In this area the coal seam is 2500' deep under the bottom of the Canyon. Spring Canyon, as the name would imply, contains several springs. The drainage area of Spring Canyon is well in excess of one square mile. The canyon supports a number of beaver dams indicative of perennial flow. WEST RIDGE will add three additional monitoring points to collect baseline water monitoring data in Spring Canyon, namely ST-15 located upstream from the junction of Grassy Trail Creek, SP-101 located on a channel-bottom spring a short ways up Little Spring Canyon (a fork of Spring Canyon), and SP-102 located about 1000' upstream from the junction of Little Spring Canyon. This spring emanates from the west side of the canyon approximately 200' up from the canyon bottom. Refer to Map 7-7 and Table 7-1 for details. For the first two years (starting with the third quarter of 2005) these sites will be monitored on a quarterly basis for baseline data according to the field measurements and laboratory measurements outlined in Table 7-2 (Surface Monitoring) and Table 7-3 (Groundwater Monitoring). Thereafter, all sites will be monitored for flow and field parameters on a quarterly basis.

The Grassy Trail Dam and Reservoir is located immediately outside the eastern boundary of the permit area. This dam/reservoir is owned and operated by the cities of East Carbon and Sunnyside, has a storage capacity of 916 acre-feet, and provides most of the culinary water supply to these municipalities. The dam lies approximately 1664' vertically and 995' horizontally away from the nearest point of projected underground mining (longwall panel #7). This equates to 31 degrees, which is greater than the normal angle of draw associated with longwall subsidence. WEST RIDGE Resources has hired R,B&G Engineering to prepare a detailed evaluation report of the potential effects of longwall mining on the dam and reservoir. This evaluation report was reviewed by the Division of Dam Safety, DOGM, Bureau of Land Management, and the cities of East Carbon and Sunnyside. The report analyzed the potential impacts from both subsidence and seismicity associated with full extraction mining, with specific emphasis on panel #7, the longwall panel projected for mining nearest to the dam. The report concluded that the risk to the dam and reservoir is minimal, and that event the maximum probable seismic event or subsidence scenario would be well within the safety factor of the dam. In addition, there are no known faults that intercept the dam that could be encountered in the mining of Panel #7. The Division of Dam Safety, the BLM, and the cities of East Carbon and Sunnyside have all accepted the conclusions of the report. This report (Grassy Trail Dam and Reservoir Seismicity Report) is included in Appendix 5-11. This report also includes as an

appendix an independent report prepared by Agapito Associates (Estimated Impacts to the Grassy Trail Reservoir due to Longwall Mining) which addresses the potential effects on the dam/reservoir due to longwall induced subsidence. A companion report (Grassy Trail Dam & Reservoir Phase II Dam Safety Study) is included as Appendix 5-12. WEST RIDGE has committed to an intensive program of monitoring of the dam and reservoir during the mining of Panel #7. This monitoring plan is outlined in section 301-114.100 of this Mining & Reclamation Plan and is included indetail in Appendix 5-13.

Based on subsequent approval of the mine plan, panel #7 was extracted starting in December, 2005, and completing in September 2006. Extraction closest to the Grassy Trail Reservoir occurred in March, 2006. Monitoring, as described above, was conducted continuously during the mining of panel #7. As predicted by the RB&G report, there was no mining related damage to the dam, although some slumpage of the adjacent hillside occurred, resulting in minor movement of the west abutment of the dam. There was no loss of integrity of the earthen structure of the dam. In January, 2008, after the area above and adjacent to panel 7 had completely stabilized, RB&G Engineering prepared a post-mining Summary Report of the mining-induced seismicity. This report is included in Appendix 5-16.

After panel 7 was completed, longwall mining moved to the west side of the mains near the outcrop (more than two miles distant from the dam), and then proceeded to the northeast. Also during this time, the company went to a panel-barrier system of longwall extraction, replacing the previous side-by-side panel method. This panel-barrier system leaves a 400' wide solid barrier pillar between each longwall panel, and has significantly reduced the magnitude and frequency of mining-related seismic events. During the ensuing five years of mining, the company has continued to monitor the dam and reservoir. Results of this monitoring have been provided to all the regulatory agencies and the owners of the reservoir on a regular basis. The results of this monitoring have shown that all mining-related effects on the reservoir have stabilized. RB&G Engineering then, in September, 2010, prepared a summary report update of the subsequent mining-induced seismicity, and this report is included in Appendix 5-17.

On July, 21, 2010, BLM approved the R2P2 for federal lease UTU-78562 and approved mining of panels 18, 19 and 20 on the east side of the mains in the vicinity of the Grassy Trail Reservoir. In the decision document, BLM states, *"We agree with the conclusion that mining longwall panels 18 through 20 as submitted should have no adverse effects on the dam structure or reservoir. The dam structure has seen no detectable affects from the mining of panel number 7. The proposed panels are further distant from the reservoir and much further from the Grassy Trails Reservoir dam. Also, the new panel-barrier design has reduced dramatically the amount and intensity of any mining induced seismicity or subsidence. Additionally, this mining plan will comply with the lease stipulation to not subside perennial*

streams, unless authorized, as the Left Fork Whitmore Canyon Stream will be under a barrier pillar and no full extraction mining is planned under the stream." A copy of the approved R2P2 for panels 18-20 is included in Appendix 5-3C. As with the previous mining of panel 7, the company commits to conducting the same level of intensive monitoring of the dam during longwall mining of panel block 18-20, as previously approved by the regulatory agencies, as stated above, and included in Appendix 5-13.

As mentioned in the BLM approval letter, mining of panel block 18-20 will be further distance away from the Grassy Trail dam than with panel 7. Panel 7 mined within 995' (horizontal) from the dam, while the closest mining from Block 18-20 would be more than 3000' (horizontal) away. Also, panel 7 was about 1664' stratigraphically lower than the dam; while panel block 18-20 is located more than 2200' lower than the dam. Also, panel 7 was mined using side-by-side panels, whereas panel block 18-20 will be mined as panel-barrier, further reducing the potential for seismicity.

It is considered very unlikely that adverse impacts to the hydrologic balance will occur as a result of mining activities in the 273.43-acre permit boundary change area that will allow longwall mining of Panel 22. The reasons for this conclusion are summarized below.

The coal seam in the development entries to be mined in the Panel 22 permit modification area is separated from the land surface by more than 2,650 feet of bedrock cover. The depth of cover overlying longwall Panel 22 will range from about 2,800 to 3,500 feet, which will make the West Ridge Mine the deepest coal mining in operation in the world when this area is mined.

The overburden in the Panel 22 permit modification area is made up of a heterogeneous sequence of bedrock formations which creates alternating horizons of mostly impermeable rocks and relatively permeable rocks (See Appendix 7-1). This heterogeneity prevents significant vertical or horizontal movement of groundwater within the overburden. The overburden present above the Panel 22 longwall mining area includes the entire thickness of the North Horn Formation, Price River Formation, Castlegate Sandstone, and portions of the Colton Formation. A southwest to northeast geologic cross section through the Whitmore Canyon and adjacent areas that depicts these relationships is provided in Appendix 7-1 (see cross-section A-A' in Figure 6 of Appendix 7-1). In particular, the North Horn Formation is known regionally to contain hydrophyllic clays that swell when wetted to seal fractures that may form (Appendix 7-1).

There will be no longwall mining beneath the Right Fork of Whitmore Canyon Creek. The only mining under the Right Fork will be the full-support mining of development entries associated with the longwall bleeder system. Using these mining techniques, no subsidence of the land surface is anticipated, and the

potential for fracturing of overlying strata is minimized.

Accordingly, because only full-support development mining techniques will be used, there should be *no* subsidence of the stream bed in the Right Fork of Whitmore Canyon in the Panel 22 permit modification area. Accordingly, the potential for fracturing of overlying strata beneath the stream bed will be negligible.

It should be noted that the Division has previously approved development mining beneath the Right Fork of Whitmore Canyon. Development mining for longwall panel 20 has already occurred under the currently approved mining plan (under about 2,200 feet of cover). The proposed mining of development entries for longwall panel 20 in the panel 20 extension area will occur under an additional at least 400 feet of cover.

A stream gain/loss study was performed by Petersen Hydrologic, LLC in the Right Fork of Grassy Trail Creek in October 2011. A report summarizing the findings of this investigation is provided in Appendix 7-14. The purpose of the gain/loss study was to provide a baseline characterization of spatial variability in baseflow stream discharge rates in the stream reaches in proposed mining areas (i.e. to characterize gaining and losing reaches of the stream). Additionally, the study provides insights into interactions between groundwater and surface-water systems in the canyon.

Petersen Hydrologic reports that the maximum upstream flow (above proposed mining areas) on 24 October 2011 was 673 gpm measured at monitoring site 2. The maximum downstream flow (below proposed mining areas) on that same day was 712 gpm monitored at site 11. Discharge rates measured in the middle portions of the surveyed stream reach are somewhat lower.

During the field investigation, it was observed that materials comprising the stream channel substrate in the Right Fork consist of cobbles, gravels, and fine-grained sands and silts in varying proportions. The width of the valley bottom is also variable within the surveyed reach of the Right Fork. Both the uppermost and lowermost portions of the surveyed stream channel were relatively narrow bottomed, while the valley bottom widened considerably in the middle reaches. Also present in the middle reaches of the Right Fork was a series of beaver dams.

Discharge rates were measured at 11 locations along the surveyed stream course (see Appendix 7-14 for locations). At nine of these locations, discharge measurements were performed using a current-velocity meter and a wading rod. The other two measurements were performed at the permanently installed Parshall flumes in the Right Fork. The results of these measurements are presented in Appendix 7-14, (Appendix 7-14; Table 1, and are plotted in Figure 2).

When the stream was surveyed in October 2011, there was a net increase of 39 gpm from the maximum measured upstream flow (673 gpm) to the maximum

downstream flow (712 gpm), which represents a gain of approximately 5.8%. The maximum up-stream discharge measurement was determined using the newly installed 3-foot Parshall flume at station RF-2. The maximum downstream discharge measurement was performed using a current-velocity meter and a wading rod at a location a short distance below the lower flume (RF-1). It should be noted that under ideal conditions, the accuracy range of stream flow measurements performed using a current velocity meter and wading rod is typically on the order of 5 to 10 percent. The typical range of measurement error for a well constructed and maintained Parshall flume is approximately 3 to 5% plus head detection error (see USBR water measurement manual). Thus the 5.8% measured difference between the maximum upstream and maximum downstream flow readings is within or slightly greater than the anticipated margin of error anticipated for the flow measurement techniques utilized.

Petersen Hydrologic concluded that it is likely that the decrease in stream discharge rates measured in the middle portion of the surveyed stream channel results from groundwater-surface-water interactions (i.e. the infiltration of surface flows into zones of permeable alluvium beneath the stream channel). This effect is likely most significant in the middle portions of the surveyed Right Fork where the canyon bottom widens and a series of beaver dams impounds surface waters on the underlying alluvial sediments.

Petersen Hydrologic concluded that the flux of water moving down the Right Fork drainage includes both surface flows within the stream channel and also waters migrating through subsurface zones of coarse alluvial sediments beneath the stream channel. Such occurrences are very common in streams in the region. In some zones, more water moves through the alluvium, in other zones it is less. Most notably, in the middle reaches of the surveyed stream, where the valley bottom is wide and a series of beaver dams impounds water over broad portions of the valley floor, the stream looses water which flows into the underlying alluvial groundwater system. In the lower reaches of the surveyed stream the valley bottom becomes narrower and stream discharge rates increase as water flows from the alluvium into the stream channel. It is important to note that discharge rates in the Right Fork at the most downstream monitoring point are similar to or slightly greater than those measured at the maximum upstream monitoring point (RF-2). What this indicates is that, while some Right Fork stream water recharges the alluvial groundwater system in the middle reaches of the surveyed stream, this same water likely reemerges at downstream locations in the drainage (i.e. there is no apparent loss of water from the drainage).

Petersen Hydrologic concluded that the measured 5.8 percent increase in discharge rate at the lower monitoring site relative to the maximum upstream site may be explained by 1) the forcing of alluvial groundwater to the surface near the mouth of the canyon as the valley width decreases, and perhaps also as the Grassy Trail Reservoir groundwater system is intersected, , 2) typical discharge measurement

error, 3) minor contributions of groundwater to the stream flow in the surveyed reach of the stream, or 4) a combination of these factors.

What this indicates is that, while there may possibly be a modest gain of water in the stream, there is apparently no large source of groundwater gain between the stream areas above and below proposed mining areas.

What these discharge measurement indicate is that during baseflow conditions, approximately 94% of the water that flows down the Right Fork of Whitmore Canyon in proposed mining areas is sourced from regions higher in the drainage. These source areas are completely outside areas which could potentially be impacted by mining operations at the West Ridge Mine. Given that no mining-related subsidence of the stream channel or valley bottom is anticipated, and that the stream is separated by the underlying development entries by at least 2,650 feet of cover, it seems exceedingly unlikely that detrimental impacts to discharge rates in the Right Fork drainage could occur. Similarly, in the absence of physical changes to the stream channel itself, detrimental impacts to water quality in the stream are likewise not anticipated.

In the very unlikely event that impacts to the stream channel or underlying alluvial groundwater system were to occur as a result of mining-related activities at the West Ridge Mine, these would be readily detectable in discharge rates at the lower monitoring station in the Right Fork relative to upstream discharge rates measured at flume RF-2. Petersen Hydrologic indicates that in the lower reaches of the drainage, there is readily measurable discharge of alluvial groundwater into the overlying stream channel. Any potential upstream losses of flow (either from the stream itself or from the underlying alluvial groundwater system) should be manifest as a decrease in flow in the vicinity of the lower flume RF-1. Accordingly, because impacts to either the surface-water and/or alluvial groundwater components of the hydrologic balance in the area can be monitored at RF-1, and because of the very low level of risk associated with full-support development mining only, with no anticipated subsidence, under more than 2,650 feet of cover, the construction of alluvial groundwater monitoring wells does not seem warranted at this time. The fact that the essentially all of the water present in the drainage under baseflow conditions originates from areas outside the proposed mining areas (which will not be impacted) further supports this conclusion (see Appendix 7-14).

It should be noted here that Petersen Hydrologic indicates that the lower flume in the Right Fork of Whitmore Canyon (RF-1) is situated atop coarse grained alluvial deposits consisting largely of cobbles and gravels. Discharge measurements performed in the Right Fork on 24 October 2011 suggest that during baseflow conditions, an appreciable portion of the surface water present above the flume bypasses the flume itself and flows through the coarse alluvium beneath the flume (see Appendix 7-14). Accordingly, these factors should be considered when discharge data from RF-1 are interpreted. Accordingly, when discharge monitoring

occurs at RF-1 during low-flow periods (when the relative contribution of the subsurface flow component is substantial and when the flows are near the lower working range of the flume, discharge monitoring will be performed a short distance below the RF-1 flume in order to gain a more accurate measurement of the stream flow in the lower Right Fork.

It should also be noted that during drought periods or at times when the stage of the Grassy Trail Reservoir is lowered, water levels in the Right Fork alluvial groundwater system near the reservoir may correspondingly decline. As a result of the declining alluvial water levels, upwelling of alluvial groundwater into the lower Right Fork stream channel could temporarily diminish or cease (i.e. much or even all of the water in the drainage could migrate through the coarse, permeable alluvium beneath the stream channel). The lack of the reemergence of the alluvial groundwater into the channel in this area would result in a decrease in the measured flow in the stream. Thus under persistent drought conditions or low reservoir levels it is possible that surface flow could be present in the vicinity of the upper flume (where the alluvium is apparently both less extensive and less permeable), but absent near the mouth of the drainage where the abundance of coarse-grained, permeable alluvium is present beneath the stream channel. Accordingly, it will be necessary to carefully evaluate climatic conditions and reservoir stage levels when evaluating the reasons for potential future low flows in the lower reaches of the Right Fork.

If in the future a loss of flow in the Right Fork is suspected, it would be useful to at that time repeat the gain/loss investigation as performed by Petersen Hydrologic (Appendix 7-14) to quantify changes to the system that may have occurred.

While no longwall mining beneath the Right Fork drainage will occur, longwall mining beneath the adjacent upland areas will occur at panels 20, 21, and 22. For several reasons, it is considered very unlikely that the undermining of these areas will result in detrimental impacts to the hydrologic balance. The basis of this conclusion is described below.

It has been the previous experience at the West Ridge Mine that subsidence measured above longwall mining panels in this portion of the mine has been minimal (typically on the order of an inch or less, and in many instances it has been undetectable). Because of the very large depth of cover in proposed mining areas (2,700 to 3,500 feet), and the minimal amount of anticipated surface subsidence, it is considered unlikely that groundwater systems in the Colton Formation exposed at the land surface and in the upper several hundred feet of overburden in the area would be adversely affected by the proposed mining activities.

No springs have been identified in the area directly overlying longwall panel 22 within the panel 22 extension area. The springs identified in the area surrounding Panel 22 discharge from the Colton Formation. Beneath the Colton Formation lies

the entire thicknesses of the North Horn Formation, Price River Formation, and the Castlegate Sandstone. The presence of these formations between the coal mine workings and the land surface creates an effective hydraulic barrier to downward groundwater flow. A single spring (6-113) overlies a gateroad entry for Panel 22 in the existing permit area which has already been approved for mining. Spring 6-113 discharges from the Colton Formation at a rate of about 1.5 gpm (Appendix 7-6a). Spring 6-113 is separated from the proposed Panel 22 mine workings by about 2,800 feet of bedrock overburden. The presence of the more than ½ mile vertical thickness of relatively impermeable bedrock strata that separates spring 6-113 from the mine workings, and the minimal anticipated ground subsidence associated with the longwall mining (likely less than an inch) suggests that the potential for impacts to this spring is minimal.

Springs RFS-1 and RFS-2 were identified in the 2011 Petersen Hydrologic spring and seep survey (Appendix 7-6b). These springs are located several hundred feet from Panel 22 and, due to the thick overburden thickness and the lack of any anticipated subsidence should not be impacted.

Springs 6-104, 6-105, 6-106, and 6-107 all discharge from alluvial deposits near the Right Fork stream channel (Appendix 7-6a). Coal mining in the vicinity of these alluvial springs will consist of full support development mining only. As no subsidence in these areas is anticipated, and because the springs are separated from the development mine entries by more than 2,600 feet of overburden, impacts to these springs are considered unlikely.

It is illustrative to compare the recommended minimum overburden thicknesses for coal mines as recommended by the SME in the Mining Engineers Handbook (See Chapter 10.6, "Mine Subsidence"). The Mining Engineers Handbook recommends that *for total extraction mining* a vertical distance between the mine and a water body *with potential for causing catastrophic damage* should be a minimum of 60 times the coal mining height. The same vertical separation distance is recommended for protection of aquifers overlying total extraction mining areas. (A similar standard has often been applied by Federal and State regulatory agencies in Utah coal mining permitting activities). Using a conservative estimate of a 10-foot coal seam thickness to be mined, the minimum overburden thickness required for protection of overlying surface water bodies and aquifers situated above total extraction areas would be 600 feet. Given that the overburden thickness above the proposed longwall Panel 22 ranges from about 2,800 to 3,500 feet, it is calculated that the overburden thickness present above Panel 22 is 4.6 to 5.8 times the minimum recommended by SME. Similarly, given that the vertical distance between the Panel 22 bleeder entries and the stream channel in the Right Fork of Whitmore Canyon exceeds about 2,650 feet, it is calculated that the overburden thickness there is 4.4 times the minimum thickness recommended by SME for *total extraction mining* below the creek. Given that only full support development entry mining will occur beneath the creek, it follows that the potential for adverse impacts

to the creek bed as a result of the proposed development mining is negligible based on considerations set fourth by SME.

It should be noted that groundwater has previously been encountered in fault systems at the West Ridge Mine. Water bearing fault zones have also been occasionally encountered at other surrounding coal mines in the Book Cliffs coal mining district. If a water-bearing fault system were to be intercepted by the mine workings in the Panel 22 permit modification area, groundwater inflows from the fault system could occur. However, because of the thickness of the overburden in the area (> 2,700 feet), and the poor vertical water transmitting potential of the clay-rich overburden lithologies (which are known regionally to contain clay minerals that have the tendency to heal mining-induced fractures when wetted), the potential for a possible fault system to intercept shallow groundwater systems that could support springs or provide baseflow to streams is considered low (See Appendix 7-1).

As mining progresses beneath the Right Fork of Grassy Trail Creek drainage, the rates of groundwater interception in each longwall panel area will be closely monitored. West Ridge Resources plans to install a total of six flow meters to measure the discharge from each of the three longwall panels in the Right Fork of Grassy Trail Creek drainage (two each in Panels 20, 21, and 22). The locations of these flow meters are shown in Appendix 7-16. By having flow meters at the outflow points of the longwall panels (located at sumps in both the headgate and tailgate entries) it will be possible to quantify the groundwater interception rates in each panel as the drainage is undermined.

If substantial, sustained inflows of groundwater (exceeding about 250 gpm for more than one month) are encountered when mining in the Right Fork drainage (longwall Panels 20, 21, and 22), a qualified Hydrogeologist will perform a hydrogeologic investigation of the intercepted groundwater system. It should be noted that the interception of modest quantities of ancient Blackhawk Formation groundwater during mining operations in the Left Fork is anticipated (this is a common occurrence in essentially all Utah coal mines). The less common occurrence of a sustained, significant flow will warrant further hydrogeologic investigation. The purpose of the hydrogeologic investigation will be to characterize the intercepted groundwater system and, where possible, determine its likely source. Where directed to do so by the Division, the results of the hydrogeologic investigation will be incorporated as a revision of this PHC.

It should be noted that after the mining in this district is completed, that portion of the mine will be permanently sealed. As a result, discharge data from this area can be collected only for as long as the area remains open and accessible. Based on current mining projections, this area will likely be sealed in early- to mid-2013.

728.320 Presence of acid-forming or toxic-forming materials

Acid-forming materials in western coal mines generally consist of sulfide minerals, namely pyrite and marcasite, which, when exposed to air and water, are oxidized causing the production of H^+ ions (acid). Oxidation of pyrite will occur in the mine; however, acidic waters will not be observed in the mine. The acid is quickly consumed by dissolution of abundant, naturally occurring carbonate minerals. Iron is readily precipitated, as iron-hydroxide, and excess iron will be not observed in mine discharge water.

No other acid-forming materials or any toxic-forming materials have been identified or are suspected to exist in materials to be disturbed by mining.

728.331 Sediment yield from the disturbed area

Undisturbed drainage from C Canyon upstream from the mine yard facility area will, for the most part, be culverted underneath the mine site by means of a 4' diameter corrugated metal pipe in the right fork and a 3' diameter culvert in the left fork drainage. This culvert has been sized to meet or exceed the design storm for this drainage area. Runoff from the mine site disturbed area and whatever natural runoff which flows onto the disturbed area will be channeled to the mine site sediment pond. The drainage control system for the mine site is shown on Map 7-2.

The culvert and ditch system is designed to handle drainage from a 10 year, 24 hour event. Any storm event that exceeds this amount will flow through the mine yard drainage structures to the sediment pond. If a storm should exceed the design event and the magnitude of the runoff exceeds the pond capacity, the over flow will be channeled through the pond cells and out the emergency spillway to the natural drainage channel below the sediment pond. This overflow will have a lower suspended solid content than the inflow to the pond or any drainage which may be flowing down the natural drainage channel. The sediment pond will detain the inflowing water and allow suspended solids to settle out in the pond cells prior to discharge. Given the ephemeral nature of the drainages and the fact that the sediment pond is designed for the complete retention of the 10 year, 24 hour storm event, it is unlikely that discharge from the sediment pond will occur very often if ever. Since the sediment pond is designed to completely contain the 10 year, 24 hour event, only a limited amount of outflow, that in excess of the design event, would be discharged. Excess water contained in the sediment pond following runoff events would be allowed to settle and evaporate, or be decanted in a controlled manner through the primary discharge pipe to reduce the potential for erosion downstream.

Using the Universal Soil Loss Equation (USLE), an estimate of the annual sediment yield from the mine site disturbed area (in the pre-mining condition) is 0.3082 acre-

feet per year. In the operational phase, this same area (the mine yard disturbed area) would then yield 0.3090 acre-feet per year. During the postmining phase, the estimated annual sediment yield is projected to be 0.2679 acre-feet per year. Even though the sediment yield from this area will be greater during the operational phase, the sediment pond has been designed to handle the sediment yield from the disturbed area and retain it in the pond. This will effectively reduce the sediment yield from the disturbed area to an insignificant amount during the operational phase of the mine.

The sediment pond will be constructed as soon as practical at the mine site during construction. When reclamation of the mine yard is initiated following the operational phase, the sediment pond will be removed during removal of the bypass culvert and restoration of the natural channel through the site. Silt fences will be installed adjacent to the reclaimed channel to collect and contain sediment from the regraded site. The silt fences will be constructed approximately along contour with overlapping ends to prevent drainage from going around the ends. Refer to Map 5-9. Because the surface of the regraded area will be gouged with a backhoe bucket to create large depressions, the depressions of the regraded area will also act as a sediment trap. It is anticipated that sediment yield from the reclaimed area will be similar to other adjacent undisturbed areas.

During reclamation, if it is determined that topsoil resources are needed from the topsoil borrow site to achieve reclamation of the mine site, silt fencing would be placed around the outer limits of the borrow area to be disturbed. Topsoil would be stripped and stockpiled. The required amount of topsoil would then be removed from the borrow site. Care would be taken to contour the borrow pit such that runoff infiltration would be maximized to the fullest extent within the disturbed area. This would include gouging the regraded surface with pits approximately 24" wide, 36" long and 18" deep as well as sloping the regraded slopes inward to encourage precipitation infiltration on-site.

There will be no new surface disturbances associated with the 273.43-acre Panel 22 permit modification area. Little or no subsidence of the land surface is anticipated as a result of the proposed mining operations (likely a few inches or less). Accordingly, no increase in sediment yield from disturbed areas is anticipated as a result of mining and reclamation activities in the permit modification area.

728.332 Impacts to important water quality parameters

WEST RIDGE Resources, Inc. anticipates that at some time it may be necessary to discharge water from its proposed mine into the C Canyon drainage. The distance from the proposed discharge point in the ephemeral C Canyon to the confluence with the first perennial stream, Grassy Trail Creek near Sunnyside Junction, is approximately 10 miles. Because of the general aridity of the region, and the permeable nature of the alluvial sediments over which the discharge water will flow, it is unlikely that the

above-ground flow of discharge water will persist to the confluence with Grassy Trail Creek. When mine water is discharged into an ephemeral drainage from Andalex's Tower Mine (located in the Book Cliffs 15 miles north of West Ridge), water flows in the drainage for less than one mile before the flow is entirely lost to infiltration or evapotranspiration. Likewise, Icelander Creek, which flows over alluvial sediments at the base of the Book Cliffs Escarpment just south of East Carbon, flows for only about 4 miles before being totally lost to infiltration. Therefore, there will most likely be no impacts to important water quality parameters in Grassy Trail Creek from proposed mining operations because mine discharge water will likely not reach the creek. However, if mine discharge water were to persist in the stream channel to the confluence with Grassy Trail Creek, the volume of discharge water entering the creek will be only a fraction of that which discharged from the mine.

Discharge water from the Sunnyside Mines located southeast of West Ridge had TDS concentrations of about 1,600 mg/l, with the dominant ions being sodium, sulfate, and bicarbonate (Sunnyside Coal Company, 1993). The chemical composition of this water is similar to that of waters that have been in contact with the Mancos Shale. The TDS concentration of discharge water from WEST RIDGE Resources, Inc.'s proposed new mine will likely be similar to discharge from the Sunnyside Mines.

The TDS concentration of water in Grassy Trail Creek at the mouth of Whitmore Canyon, (USGS station 0931430) near the upper contact with the Mancos Shale, averaged 988 mg/l between 1979 and 1984, with the dominant ions being sodium, sulfate, and bicarbonate (Waddell, 1981). The water quality of Grassy Trail Creek after flowing over 11 miles of Mancos Shale sediments to the confluence with the C Canyon drainage near Sunnyside Junction is significantly degraded.

Due to the low anticipated volume of mine discharge water which will flow into Grassy Trail Creek, and the similarity of the chemistry of the mine discharge water to the water in the creek, the water quality in Grassy Trail Creek will likely not be significantly impacted by mine discharge water.

Because of the poor quality of the water naturally flowing in Grassy Trail Creek near Sunnyside Junction and the relatively small quantities of mine discharge water (if any) which will flow into the creek, important water quality parameters in Grassy Trail Creek, such as sodium, sulfate, and bicarbonate will not be significantly increased.

Most of the water from any potential discharge from WEST RIDGE Resources, Inc.'s proposed new mine will infiltrate into the alluvial sediments in Clark Valley near the Book Cliffs escarpment. This will result in a rise in the local water table, or the creation of a perched water table above impermeable layers. Shale layers in the Mancos Shale will prohibit significant downward migration of these waters. The raising of the local water table may result in increased vegetation in the area. The increase in vegetation and the presence of surface water in the drainage would be a positive impact on wildlife and the local ecosystem. There are no known water rights

or surface facilities adjacent to the stream drainage that could be impacted by the rising water table. Because the water quality of groundwaters in the Mancos Shale is naturally poor (with TDS significantly greater than 1,600 mg/l), the addition of mine discharge water to this system will not have any detrimental effects on water quality.

The Sunnyside mines discharged water from the mine workings for many years. This water was put to beneficial use for agricultural purposes such as growing alfalfa crops and also for irrigating the municipal golf course, from the time it was built in 1967 up to the closure of the mine in 1993. The city park also used the mine water for irrigation since the mid-1940's. Sunnyside Coal Company had an approved UPDES permit with a TDS concentration limit of 1,650 mg/l for the mine water discharge. Excess water was discharged into Grassy Trail Creek where it was also utilized by cattle and wildlife.

The chemical quality of groundwater discharging from springs above the proposed coal mine will not be adversely affected by underground mining operations. The chemical quality of surface water flowing in upper Grassy Trail Creek will likewise not be adversely affected by underground mining operations. It has been demonstrated (Mayo and Associates, 1997; Appendix 7-1, 2001; Appendix 7-1A) that deep groundwaters adjacent to the coal seams throughout the Book Cliffs and Wasatch Plateau coal fields are hydraulically isolated from shallow overlying groundwater systems which support springs and provide baseflow to streams at the surface. There is no mechanism by which important water quality parameters in shallow groundwater systems above WEST RIDGE Resources, Inc.'s proposed coal mine may be adversely impacted by mining operations.

There are no known springs of significance in the lease and adjacent area which discharge from locations that are stratigraphically or topographically below the coal seam to be mined. The thick Mancos Shale will prevent the migration of any mine discharge water downward to formations underlying the Mancos Shale. No seeps or spring exist within or adjacent to the proposed topsoil borrow area to the west of C Canyon.

There should be no change to the quality of mine discharge waters as a result of mining in the 273.43-acre Panel 22 permit modification area. This conclusion is based on the assumption that mining conditions and the hydrogeochemical regime in the proposed mining area will be similar to those encountered elsewhere in the West Ridge Mine. The chemical quality of groundwater discharging from springs in the permit boundary change area should not be adversely impacted as a result of the proposed mining operations. This conclusion is based on the fact that 1) springs in the area are separated from the underlying mine workings by more than 2,500 feet of overburden, and 2) because of the minimal subsidence anticipated in the area, significant impacts to bedrock or alluvial strata that support groundwater flow to spring discharge locations likely will not occur.

728.333 Flooding or streamflow alteration

WEST RIDGE Resources, Inc. anticipates that at some time it may be necessary to discharge water from its proposed mine into the C Canyon drainage. The discharge point will be about 1 mile above the confluence with B Canyon. Both C and B Canyons are ephemeral drainages that rarely have flow. The stream channel in this drainage is large enough to contain torrential thunderstorm events that commonly exceed several cfs in this region. The anticipated discharge rate from the mine is unknown at this time. However, historic discharges from nearby mines in the Book Cliffs coal field (Soldier Canyon and Sunnyside) average about 300 to 400 gpm. It is possible that over the life of the mine the discharge rate from WEST RIDGE Resources, Inc.'s proposed mine could be in this same range. However, it must be noted that as new mine workings are developed in "wet" areas, the discharge rate may temporarily exceed this amount. It is anticipated that similar mining conditions will be encountered in mine workings in the proposed the 273.43-acre permit boundary change area that will allow longwall mining of Panel 22. The discharge rates from these mines have been quite variable over time due to the nature of the groundwater systems encountered in the mines. Groundwater encountered in coal mines in the Book Cliffs and Wasatch Plateau coal fields is contained mostly in sandstone channels and in fractures and faults. It is not unusual for large portions of the mines to be mostly dry. For these reasons, the mine discharge rate is more a function of the amount of new mine area recently opened than the total size of the mine. At the Soldier Canyon Mine, mining proceeded for several years before any significant water sources were encountered and thus, no discharge occurred. Similar experiences are reported at Andalex's Tower Mine. Thus, although short-term increases in mine discharge rates will likely occur, the long-term average will probably be in the range of 300 to 400 gpm if water is encountered.

A discharge of 300 to 400 gpm will not cause flooding or significant alteration of the streambed in the C Canyon drainage. The channel geometry in C Canyon is primarily the result of erosion which occurs during torrential thunderstorm events where the flow in the drainage is several times that anticipated from WEST RIDGE Resources, Inc.'s proposed mine. The mine discharge will easily be contained within the inner stream channel, which should be stable. Additionally, if a constant, relatively small discharge is achieved in C Canyon as a result of mine discharge, the net effect will be a positive one. Vegetation densities along the stream bank will increase causing increased bank stability and decreased erosion. Wildlife habitat will also be improved with the available water and the vegetation growing on the stream bank.

No streams exist in or adjacent to the proposed topsoil borrow area west of C Canyon in section 16, T. 14 S., R. 13 E.

Rates of Groundwater interception at the West Ridge Mine have varied with time and location during the period of operation of the mine. While some areas of the mine have been relatively dry, other portions have been considerably wetter. While it is not possible to predict with certainty the quantities of water that will be intercepted in any

given mining area, it seems unlikely that anomalous quantities of water (of such a magnitude that flooding or streamflow alteration resulting from the discharge of mine water to the surface) will be encountered in the Panel 22 permit modification area.

728.334 Groundwater and surface water availability

Mining in the permit area (including the 273.43-acre permit boundary change area that will allow longwall mining of Panel 22) will not significantly affect the availability of groundwater. Groundwaters in the Blackhawk Formation exist in highly compartmentalized partitions, both vertically and horizontally, and the formation does not act as a hydraulically continuous aquifer. Groundwater systems in the Blackhawk Formation are hydraulically isolated from overlying, modern groundwaters. The effects of locally dewatering the Blackhawk Formation adjacent to mine openings will not have any significant impact on groundwater availability in the region surrounding the mine.

There are no groundwater supply wells in the mine lease area or adjacent to it. Likewise, there are no water supply wells in the 273.43-acre Panel 22 permit modification area. The removal of water from horizons immediately above and below the mined horizon will not impact any water supplies. Rather, underground mining makes water available from the Blackhawk Formation that was previously inaccessible.

Because of the extreme thicknesses of the bedrock overburden in the Panel 22 permit modification area, and the fact that only full-support development mining will occur beneath the Right Fork of Whitmore Canyon Creek (with more than 2,700 feet of cover), it is considered very unlikely that adverse impacts to the availability of surface waters in the creek will occur (See discussion in Section 728.310). Similarly, because of the extreme thickness of bedrock overburden overlying longwall Panel 22 (about 2,700 to 3,500 feet), adverse impacts to discharge from springs in the area are not anticipated (See discussion in Section 728.310).

For the reasons discussed above (including Section 728.310) the underground coal mining and reclamation activities in the Panel 22 permit modification area should not result in the contamination, diminution, or interruption of State-appropriated water.

728.400 The hydrology and geology of the area around Grassy Trail reservoir is discussed in a seismic analysis report (see Appendix 5-11) and the Phase II dam safety report (see Appendix 512). These reports conclude that it is unlikely that mining induced seismicity or subsidence will impact the performance of the Grassy Trail Dam and Reservoir. Based on the conclusion of this study the BLM has approved the R2P2 to allow full extraction longwall mining of Panel #7. BLM also added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, "*The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease.*"

Based on BLM's approval the company then successfully mined longwall panel 7 from December, 2005 through September, 2006. Soon thereafter, RB&G Engineering

prepared a summary post-mining report on the mining related affects on the reservoir (see Appendix 5-16). Still later, in 2010, RB7G Engineering prepared an additional update to the summary report (see e). Based on these reports, BLM has recently approved the R2P2 to allow additional longwall mining of panel block 18-20 on the east side of the mains in the vicinity of (i.e., west and north of) Grassy Trail reservoir (see Appendix 5-3C). This new approval contains the same reference to lease stipulation #17, as with the previous approval of panel 7.

R645-301-729 CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

The Division will provide an assessment of the probable cumulative hydrologic impacts of the proposed coal mining and reclamation operation and all anticipated coal mining and reclamation operations upon surface and groundwater systems in the cumulative impact area.

R645-301-730 OPERATION PLAN

R645-301-731 GENERAL REQUIREMENTS

A plan has been included to minimize disturbance to the hydrologic balance, to prevent material damage, and to support postmining land use.

731.100 Hydrologic Balance Protection

Groundwater Protection

Although testing has shown that no significant impacts from acid or toxic producing materials should occur, groundwater quality will be protected by handling runoff in a manner which minimizes the infiltration into the groundwater system. Examples of techniques that may be utilized to accomplish this would include routing disturbed area drainage to the sediment pond through properly sized ditches and culverts and diverting undisturbed drainage through a bypass pipe past the disturbed area.

Within the disturbed area, drainage will be directed to ditches by sloping the yard areas. The ditches will be appropriately sized to handle flow from the 10 year/24 hour event. Culverts within the drainage system have also been sized to meet or exceed the 10 year, 24 hour design criteria.

Surface Water Protection

Coal mining and reclamation activities will be conducted according to the following plan.

The sediment pond will be installed as soon as possible during construction of the surface facility area. The pond will be appropriately sized to handle the design storm event (10 year, 24 hour) for the mine site.

Protection of surface water will incorporate measures cited under Groundwater Protection. All surface runoff from the mine site disturbed area will be diverted to the sediment pond for treatment. The sediment pond has been designed to provide total containment for the 10 year/24 hour storm plus three years of sediment accumulation.

Based on sampling of the soils in the area and the fact that waste rock material will not be stored on the surface, it is unlikely that the sediment pond will impound acid- or toxic-drainage.

It is anticipated, based on the climate of the area, that the sediment pond will remain dry most of the time. (This has been demonstrated to be true for existing coal mining operations in central Utah.) Water in the pond should evaporate rapidly following precipitation events. Infiltration into ground water zones is not expected because of the interbedded nature of the strata below the pond. Thick sequences of shale in the bedrock below the pond will greatly limit the vertical movement of water. Also, the alkaline nature of other sediment flowing to the sediment pond would serve to neutralize any low pH materials when mingled together.

To minimize disturbance to the undisturbed drainage, large diameter bypass culverts will be installed beneath the mine yard facility to allow runoff upstream above the mine site to continue downstream without coming in contact with and becoming contaminated by the mine yard area.

The bypass culvert system will be the first structure to be installed during construction of the mine site facility. Undisturbed area drainage will be bypassed under the disturbed area to minimize the amount of drainage that must be treated by the sediment pond. The bypass culverts will allow natural drainage to continue down the drainage course unaffected by the mining operation. A 36" diameter culvert will be installed in the left fork and a 48" diameter culvert will be installed in the right fork. A 48" culvert will be installed in the main canyon below the confluence of the forks. The size of the culverts will adequately pass the 100 year, 6 hour flow event even though a smaller culvert would meet the requirements of the regulations.

At the topsoil pile locations, undisturbed drainage will be diverted around the stockpiles with ditches at the edge of the pile toward the undisturbed drainage channel. The ditches will divert water away from the stockpile to minimize erosion. The ditches have been sized to convey flow from the 10 year, 24 hour event. The ditches will slope 1% toward the natural drainage. A typical ditch design is presented in Appendix 7-4 "West Ridge Mine Sedimentation and Drainage Control Plan". The stockpiled topsoil material will be loosely piled and have an irregular, pitted surface or contour furrows to help retain runoff from precipitation events and to reduce erosion until vegetation becomes reestablished. A diversion ditch will be constructed at the edge of the stockpile to divert undisturbed drainage away from the stockpile. Silt fencing will be placed around the perimeter of the stockpile to treat any runoff from the pile.

The topsoil stockpile and test plots will be designated as Alternate Sediment Control Areas (ASCAs).

Refer to Appendix 5-5 for a complete discussion on the construction of the topsoil

stockpiles. Refer to Appendix 7-4 for details of the drainage control designs. Map 2-4 depicts the drainage controls of the topsoil stockpile areas.

731.200 Water Monitoring

This section describes the hydrologic monitoring plan. Locations of operational surface-water and groundwater monitoring sites are indicated on Map 7-7. Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Tables 7-1 through 7-5. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in Table 7-2, and for groundwater in Table 7-3. The hydrologic monitoring parameters have been selected in consultation with the DOGM's directive Tech-004, *Water Monitoring Programs for Coal Mines.*

Water monitoring reports will be submitted on a quarterly basis to UDOGM. Should any ground water or surface water samples indicate noncompliance with the permit conditions, the operator will promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and will provide the results of the sampling to the Division.

Operational field and laboratory parameters were measured quarterly for the first ten years of mine operation, rather than for only the first two years as originally proposed in the MRP. The original MRP stated that after a two-year period of quarterly monitoring, if sampling has adequately characterized the hydrology in the area, a request would be made to reduce monitoring to field parameters and one operational analytical sample collected during low flow (3rd Quarter). It also stated, the physical parameters and chemical composition of springs and streams in and around the permit area should be adequately characterized following the collection of three years of baseline laboratory data and two years of operational laboratory data. (The first year of field data was collected in 1985-1986. The original MRP further stated that, thereafter, continued quarterly monitoring for laboratory parameters would probably not enhance the scientific understanding of hydrologic systems in the mine permit area. Beginning in 2nd Quarter of 2011, WEST RIDGE Resources, Inc. ~~will implement this reduced schedule for ST-10 and~~ will officially drop stream sites ST-5, ST-6A, ST-7, ST-11, ST-12 and ST-13 and spring sites SP-15, SP-16, WR-1 and WR-2. Also, beginning 2nd Quarter of 2011, a total of four flumes will be added, two in the left fork, (LF-1 and LF-2) and two in the right fork, (RF-1 and RF-2). Two springs in the right fork will be added, road spring and Section 5 spring; and 1 stream in the right fork, Patterfore Stream.

Each of the sampling locations and their hydrologic significance are described below. However, in order to comply with UDOGM directive Tech-004, baseline samples will be collected from each spring in the monitoring program during the low flow (fall) sampling and from each stream monitoring site during low flow every five years beginning with the first mid-term review. The five year baseline samples will be repeated every five years until reclamation is complete.

Two years of baseline monitoring has been performed at all monitoring sites; subsequently, the quarterly operational monitoring schedule was utilized through 2010. Monitoring as specified herein will continue through reclamation until bond release unless otherwise modified.

Streams

Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. Four sites on Grassy Trail Creek have been monitored.

Stream site ST-10 is located on the north end of our mining panels, this site will be replaced by a new 2' parshall flume called LF-2. ~~a reduction in laboratory analyses from quarterly to annually will be implemented beginning 2nd Quarter of 2011.~~ Stream site ST-3 is located below the confluence with Hanging Rock Canyon. Stream site ST-8 is located just above the confluence with Water Canyon, downstream of the permit area and ST-9 is located on upper Grassy Trail Creek at the inlet to Grassy Trail Reservoir. In 2nd Quarter of 2011, Patterfore Stream was added to the permit. This stream site is located north of the extent of our mining panels in the right hand fork of Grassy Trail. These monitoring sites on Grassy Trail Creek will be used to document any potential changes in stream flow or water quality that may be attributable to mining at WEST RIDGE, so data collection efforts at these sites will continue~~, while ST-10 will be on the reduced monitoring schedule.~~ A description of Upper Grassy Trail water quality included above, which was included in the original verison of the MRP based upon two years of data, indicates that magnesium, calcium, and bicarbonate are the major ionic components, and that TDS at ST-3 is 350 mg/L. After 10 more years of data collected, analysis indicates that the assessment is still correct: those three ions still represent the majority of the dissolved solids in Upper Grassy Trail Creek, and calculated average TDS at ST-3 is 358 mg/L. Further, quarterly water quality monitoring shows that there is relatively minor temporal variation in water quality at these sites, based upon an assessment of their major ions as represented by Stiff, Piper, and Schoeller Diagrams (see Appendix 7-11). ~~Therefore, reduction in collecting analytical samples from quarterly to annually at ST-10 is supported by the record.~~

One tributary to Grassy Trail Creek within Whitmore Canyon is also monitored. ST-15 is located in at the mouth of Spring Canyon, and has been monitored since 2003. No flows have been reported since that time. It will continue to be monitored quarterly, and operational samples will be collected if flow is occurring during quarterly visits.

The sample point RST-1 was added 3rd Quarter of 2010. This site is located on the right fork of Whitmore Canyon above Grassy Trail Reservoir. In 2nd Quarter of 2011, this site will be replace by a 3' parshall flume called RF-1. This site will continue to be monitored quarterly and analyzed for operational field and laboratory parameters.

On the west side of West Ridge, five stations have been monitored for many years on ephemeral drainages contributing to lower Grassy Trail Creek. They are ST-4 (lower Bear Creek), ST-5 (below confluence of B and C Canyons), ST-6A and ST-6 (above and below the mine site, respectively, in C Canyon) and ST-7 (below A Canyon). ST-4 was monitored by visual observation of the channel for flowing water. ST-5 had a crest gauge and automatic sampler while ST-6A, ST-6 and ST-7 each had a crest gauge and bottle samplers. The west side of West Ridge stream monitoring stations, are described as follows:

ST-4 No monitoring equipment was ever located at this site. The purpose of this station was to conduct baseline observations for two years to determine whether this portion of Bear Creek acted as an ephemeral or intermittent stream channel. Based on monthly monitoring during 1997 and 1998, it has been determined that intermittent flow does not occur in the lower section of Bear Creek and the channel responds only as an ephemeral drainage following substantial rainfall events. This continued to be documented at this site until 2005, when it was officially dropped from the monitoring plan in July 2005.

ST-5 From 1997 through 2008, this location contained the ISCO automatic sampler and a crest gage. This station monitored drainage from both the B and C Canyon drainages. However, based on field observations, virtually all of the flow comes from the B Canyon drainage, primarily the lower side drainages and adjacent Mancos slopes. Both the B and C Canyon drainages respond as ephemeral drainages. In recent years, this site typically continued flows that were 100 percent comprised of mine discharge. While originally intended to cover both B and C Canyon drainages because surface facilities were contemplated in both of these canyons, its locations below the confluence is no longer important since surface facilities are contained within C Canyon, and not in B Canyon. Because the site has served its primarily purpose (to document the ephemeral nature of flows) and because it represents essentially the same data as is also collected upstream at ST-6, this site will be dropped from the monitoring plan beginning 2nd quarter of 2011.

ST-6 and ST-6A

These two stations are located below and above the proposed mine site in C Canyon, respectively. A crest gage (as described above) and bottle samplers were installed at these sites in 1997, with only partial success at registering flows or collecting samples. Once operations began at the mine, improving access and communications, these structures were less important. The long record of data at ST-6A indicated very little, if any, flow at this site even during severe precipitation events; snow melt runoff often appears to consist of underflow through the heavy organic matter in the cannel bottom. Further, once mine discharge began, ST-6 generally receives continuous flow comprised of 100 percent mine discharge. Therefore, there is no correlation

between flows at ST-6A and ST-6. The area below ST-6A was last mined in February 2007. Beginning 2nd quarter of 2011 ST-6A will be dropped while ST-6 will continue to be monitored. Although there have been some changes in ionic strength of this water over the years, as shown by Stiff, Piper, and Schoeller Diagrams (see Appendix 7-11), the basic ionic makeup of the water remains fairly constant. This water is also sampled for UPDES samples just a short distance upstream from ST-6 on a monthly basis, which provides analytical data for compliance purposes.

ST-7 A crest gage and sampler bottles have been located in the A Canyon drainage since 1997, however equipment functionality in this very flashy and sediment-laden stream has been minimal. Originally established to document drainage, it has not served any purpose in the monitoring plan for many years, since the haul road was constructed elsewhere. Further, there are no surface facilities planned for this drainage and underground mining has been progressing in the opposite direction. This site will no longer be monitored after 2nd quarter of 2011.

ST-11 This site, located in Bear Canyon, was added to the monitoring plan in 2005, for reasons described above in Section 728. It has been monitored since that time, but no flows have ever been reported. The area below ST-11 was mined out in November, 2006. This site will be dropped beginning 2nd quarter of 2011.

ST-12 This site, also located in Bear Canyon and described above in Section 728, has similarly been monitored since 2005. The area below ST-12 was mined out in October 2007. No flows have been reported since that time. It will be dropped from the monitoring plan beginning in 2nd quarter 2011 as there is no longer any reason to document flow regime in this reach of Bear Canyon.

ST-13 Similarly, this site is located in Bear Canyon, and was added to the monitoring plan in 2005, for reasons described above in Section 728. It has been monitored since that time, but no flows have been reported. This site will be dropped from the monitoring plan beginning in 2nd quarter 2011.

Springs

Eight springs in the permit and adjacent areas have been monitored since at least 1999; some of these have been monitored by WEST RIDGE since 1997, and some even earlier by other entities. Two other springs, SP-101 and SP-102 have been monitored since 2003. Four of these springs (SP-12, SP-13, SP-15, and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs, WR-1 and WR-2, discharge from the upper slope of West Ridge in Whitmore Canyon. Refer to Map 7-7. One spring (SP-8) discharges in the upper drainage of C Canyon. Hanging Rock Spring (S-80), SP-101 and SP-102 are located near the northeast corner

of the permit area and discharges from the east slopes of Whitmore Canyon.

Most of the monitoring stations in this monitoring program are located on the east slope of West Ridge. This is because, with the exception of SP-8, there are no springs that are suitable for monitoring on the west side of West Ridge.

Beginning in 2nd Quarter of 2011, monitoring at SP-15, SP-16, WR-1 and WR-2 will be discontinued. These sites are away from the direction that mining is occurring or will occur in the future, a long record is in place to document that no impacts have occurred, and any past subsidence activities have long ceased. WR-1 is located outside the West Ridge Mine permit area. It was undermined by the adjacent Sunnyside Mine workings at a depth of more than 2000' below the surface as shown on Plate 7-7. This area was undermined at least fifteen years ago. WR-2 is located 2400' above the underlying coal seam and was undermined in June, 2004 as part of the West Ridge mining operation. Subsidence monitoring has been conducted by Ware Surveying as a part of the continuing monitoring program for the Grassy Trail Reservoir located not far away. Several of the subsidence points were located above longwall panel 7 and are less than 1700' feet from WR-2. These points were undermined in March, 2006. This survey shows that mining-induced subsidence in these areas has been completely stabilized for the past three years (see Appendix 7-13). Since WR-2 was undermined by longwall panel 5 nearly two years prior to the Grassy Trails subsidence points, this provides strong assurance that the area around WR-2 has now been similarly stabilized for an even longer time period.

At sites SP-12, SP-13, SP-101, SP-102, S-80 and SP-8, quarterly monitoring will continue.

Beginning 2nd Quarter of 2011, two springs in the right fork will be added to the monitoring plan. The first will be called road spring and the second will be called Section 5 spring.

Wells

Only one groundwater monitoring well (DH86-2) exists in the permit area. This well monitors the Sunnyside Sandstone Member of the Blackhawk Formation, which is below the coal seam that will be mined. In addition to field parameters and operational water quality parameters, water level will be measured in this well. Because data collected at this site since 1997 exhibits more variability than at the other monitoring sites, quarterly analytical sampling will continue.

Underground Sampling

UG-1 Staring in the fall of 2010, West Ridge Resources will begin an underground monitoring program on the pre-treatment mine-water. A monthly sample of the in-mine water will be collected prior to treatment and analyzed for

operational field and laboratory parameters. Parameters will include total and dissolved iron, sulfate, alkalinity, total and dissolved solids, field conductivity, field temperature, field dissolved oxygen and field pH. The sample will be collected in 9th right between the seal and treatment area. This sample point will be called UG-1. Please refer to Appendix 5-15, Attachment 10 for a description and location of UG-1.

Underground Flow Meters, Right Fork Longwall Panels

In order to determine the possible affects of mining within the watershed of the Right Fork of Whitmore Canyon, the company has committed to installing flow meters in the underground mine works. Longwall panels #20, 21 and 22 are the only panels proposed to mine within the Right Fork watershed, as depicted on Map 5-4A and Map 7-8. (It should be noted that there will be no longwall mining conducted under the Right Fork; the only mining to extend under the Right Fork will be the development mining associated with the gate-roads and bleeder entries.) Any water encountered in mining these panels will have to be pumped out of the mine through any of the six development entries (gate-roads) associated with these panels (2 each gate-roads per panel). Therefore the company commits to installing a total of 6 each flow meters, one in each gate-road of the these panels in order to measure the amount of water encountered in the mine within the vicinity of the Right Fork drainage. The flow meters will be installed at the sumps where the gate-roads connect to the main entries, and where the minewater is collected and pumped into the main discharge waterline.

The specific location of these flowmeters is shown on the map in Appendix 7-16, and also Map 7-7. The flow meters will be installed at such time that any water is encountered in quantities sufficient to require pumping. The flow meters will be equipped to read instantaneous flow and total flow. The flow readings will be reported to the Division on a monthly basis. If the total cumulative flow from these meters exceeds 250 gpm (0.5 cfs) for a period of more than one month, the company will notify the Division and will initiate a hydrogeologic investigation and a subsequent revision of the PHC. The flow meters will be monitored and reported as long as any water continues to flow from these panels, or until this area of the mine is sealed, according to MSHA and BLM approvals. Under the current production schedule, the entire lower end of the mine will be sealed around March, 2013 for safety reasons, at which time the only remaining mining will be several small longwall panels near the outcrop.

Grassy Trail Flumes

In response to an agreement between the company and the owners of the Grassy Trail Dam/Reservoir (East Carbon City, Sunnyside City and Sunnyside Cogen Power Plant) flow measurements, field parameters, and lab analysis of the Right and Left Forks of Whitmore Canyon above the reservoir will be taken, as described below:

RF-1 This is a 3' Parshall flume located in the Right Fork immediately above the reservoir. This is an existing flume, owned by East Carbon City, which was recently restored to operational condition. Initial flow readings began in May, 2011. This flume will be equipped with a recording device. This flume is located downstream from any proposed mining activity below (underground). This flume now replaces RST-1 as a stream monitoring point.

RF-2 This is a newly installed 3' Parshall flume, (June, 2011). It is located in the Right Fork approximately one mile upstream (north) of the reservoir. It is also located upstream from the most northerly extent of any proposed projected future mining below. The location of this flume was selected to provide baseline flow data, in conjunction with RF-1 located downstream, to help assess the affects of potential future mining on the stream flow of the Right Fork. This flume will be equipped with a recording device.

LF-1 This is a newly installed 2' Parshall flume, (June, 2011) located in the Left Fork immediately above the reservoir. It is located in an area where an old flume, owned by East Carbon City, was previously located, but has for many years been dysfunctional. Although the coal reserves under the Left Fork have already been mined, LF-1 will provide baseline flow data to help assess the affects of previous longwall mining on the stream flow of the Left Fork. LF-1 will become an active monitoring site as soon as construction is complete, scheduled for July, 2011. This flume will be equipped with a recording device. When completed, LF-1 will replace ST-9 as a stream monitoring location.

LF-2 This is a new 2' Parshall flume located in the Left Fork approximately two miles upstream (west) of the reservoir, and is presently (July, 2011) under construction. Although the coal reserves under the Left Fork have already been mined, LF-2 will be located upstream from any mined out area below. The location of this flume was selected to provide baseline flow data, in conjunction with LF-1 downstream, to help assess the affect of previous longwall mining on the stream flow of the Left Fork. This flume will be equipped with a recording device. LF-2 will become an active monitoring site as soon as construction is complete, scheduled for July, 2011. When completed, LF-2 will replace ST-10 as a stream monitoring location.

In previous discussions with the Division, West Ridge Resources had

committed to installing Parshall flumes with continuous recording devices in both the Right and Left Forks of Whitmore Canyon. These commitments were based on the then proposed mining plan, which contemplated longwall mining with potential subsidence directly beneath the Right Fork drainage. Subsequently, as mining has progressed, due to unforeseen geologic conditions, the proposal for longwall mining beneath the Right Fork was abandoned.

Under the currently proposed mining plan, only full-support mining of development entries beneath the Right Fork is proposed. Given that 1) no subsidence of the stream channel is anticipated, and 2) the proposed development entries are isolated from the overlying stream channel by more than 2,000 feet of low-permeability bedrock overburden, the potential risk associated with the currently proposed mining activities in the Right Fork is minimal, and as such does not seem to warrant the intensive, continuous monitoring protocols previously contemplated. Additionally, it has become evident that the collection of continuous stream discharge data from the Whitmore Canyon Flumes would likely not be straightforward. The basis for this conclusion and West Ridge Resources' proposal for on-going monitoring at the Whitmore Canyon monitoring stations are discussed below.

While the currently installed continuous stream flow monitoring devices at the Whitmore Canyon Flumes can be operated successfully during the snow-free and ice-free period of the year, these systems generally cannot provide reliable discharge data when there is the possibility of snow and ice being present in the canyon (which can be approximately half of the year). This is because 1) the water in the stilling wells and piping can become frozen or blocked during cold periods resulting in the collection of non-representative discharge data, or 2) the primary measuring device (i.e. the flume itself) can be impacted by ice or accumulated snow (i.e. the accumulation of ice along the edges of the flume throat, the development of layers of surface ice in the flume throat or approach section, or the physical blockage of the flume with ice, snow, or other debris). These conditions can result in the user unknowingly computing and compiling erroneous discharge data at the flumes. The interpretation of data collected when there is a possibility of snow and ice being present becomes very problematic (i.e. it is unknown whether a change in the flume stage is a result of an actual change in the stream flow rate or whether it is a result with a problem at the flume).

Additionally, the flumes installed in Whitmore Canyon are either 2-foot or 3-foot Parshall flumes. Accurate discharge data can be determined using these flumes during the high-flow and mid-season flows when discharge rates are in the normal working range of the flumes. However, during seasonal low-flow conditions, or during drought conditions, the flows in the streams may drop below the normal working range of the flumes (resulting in less accurate flow

readings). Accordingly, discharge monitoring at these sites during the seasonal low-flow or drought conditions may be performed using an alternate appropriate discharge measurement technique a short distance below the flume locations. However, during these conditions when the alternate, manual data collection techniques are employed, continuous data collection obviously cannot be accomplished.

It should also be noted that the flumes and the automated data collection systems are not the property of West Ridge Resources. Accordingly, the maintenance and availability of these systems is beyond the control of West Ridge Resources.

While no impacts to discharge rates in the streams are anticipated, the types of impacts that could conceivably occur would likely not be of the sort that would necessitate the collection of continuous discharge data collected at frequent intervals. The level of risk to these stream associated with the proposed mining activities in the drainage is considered to be very low. Accordingly, it seems reasonable that quarterly monitoring of these streams would be sufficient to identify and quantify potential future impacts to the streams.

~~A 3' Parshall Flume or a comparable flume will be reconstructed in the right and left forks above Grassy Trail Reservoir in the Spring/Summer of 2011. Flumes will be equipped with a flow monitor and will be downloaded and reported quarterly.~~ See Appendix 7-14 for Grassy Trail Reservoir - Right Fork Historical Flow Data. See Plate 7-7 for Water Monitoring Location Points.

The company acknowledges that concerns have been raised by certain stakeholders regarding previous proposals for longwall mining under the Right Fork. However, due to unfavorable geologic conditions recently encountered in the coal seam, the company has now abandoned plans for any longwall mining under the Right Fork. Nonetheless, in deference to the concerns of the stakeholders, the company proposes to continue with additional hydrologic baseline measures discussed previously, including the following:

a) Installation and/or rehabilitation of measuring flumes in the upper and lower reaches of both Right and Left Forks of Whitmore Canyon above the reservoir (total of 4ea. flumes).

b) Installation of measuring/recording devices at each flume, within the normal operating flow limits of the flumes.

c) Installation of survey elevation monitoring stations at 100' intervals along the bottom of the Right Fork drainage within the permit area.

d) Installation of flow meters within the underground mine water collection/pumping system sufficient to adequately assess the quantity of groundwater sources encountered in the mine works in the vicinity of the Right Fork.

e) On-site location and development of selected springs in the Right Fork area subject to future monitoring, conducted in conjunction with stakeholder input.

f) Expansion of the seep and spring survey in the Right Fork to include more of the upper drainage area above longwall Panel #22.

g) Completion of a detailed gain-loss analysis of the stream flow in the Right Fork within the area of proposed development mining.

Table 7- 1 HYDROLOGIC MONITORING PROTOCOLS AND LOCATIONS

Name	Sample Parameters	Sample Frequency	Location Description
Streams			
RST-1 [1]			See note below
ST-3	Flow, Field, Lab Analysis	Quarterly	Grassy Trail Creek
ST-6	Flow, Field, Lab Analysis	Quarterly	C Canyon
ST-8	Flow, Field, Lab Analysis	Quarterly	Grassy Trail Creek
ST-9 [2]			See note below
ST-10 [3]			See note below
ST-15	Flow, Field, Lab Analysis	Quarterly	Spring Canyon Stream
Patterfore	Flow, Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
Flumes			
LF-1	Flow [4], Field, Lab Analysis	Quarterly	Left Fork of Grassy Trail Reservoir
LF-2	Flow [4], Field, Lab Analysis	Quarterly	Left Fork of Grassy Trail Reservoir
RF-1	Flow [4], Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
RF-2	Flow [4], Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
Springs			
SP-8	Flow, Field, Lab Analysis	Quarterly	North Horn Fm. In C Canyon
SP-12	Flow, Field, Lab Analysis	Quarterly	Colton Fm. Upper Whitmore Canyon
SP-13	Flow, Field, Lab Analysis	Quarterly	Colton Fm. Upper Whitmore Canyon
SP-101	Flow, Field, Lab Analysis	Quarterly	Little Spring Bottom
SP-102	Flow, Field, Lab Analysis	Quarterly	Spring Canyon Hillside
S-80	Flow, Field, Lab Analysis	Quarterly	Hanging Rock Spring
Road Spring	Flow, Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
Sec 5 Spring	Flow, Field, Lab Analysis	Quarterly	Right Fork of Grassy, Section 5
Wells			
DH86-2	Water Level, Field, Lab	Quarterly	Sunnyside Sandstone in C Canyon
Underground			
UG-1	Field, Lab Analysis	Monthly	West Ridge Mine
U-14E	Flow only	Monthly	West Ridge Mine – 14 East
U-15E	Flow only	Monthly	West Ridge Mine – 15 East
U-16E	Flow only	Monthly	West Ridge Mine – 16 East

U-17E	Flow only	Monthly	West Ridge Mine – 17 East
U-18E	Flow only	Monthly	West Ridge Mine – 18 East
U-19E	Flow only	Monthly	West Ridge Mine – 19 East

Notes:

(1) RF-1 replaced RST-1 in 2011.
(2) LF-1 replaced ST-9 in 2011.
(3) LF-2 replaced ST-10 in 2011.
(4) During low-flow conditions, discharge at these sites may be measured a short distance below the flumes using an appropriate alternate measurement technique.

ST-5, ST-6A, ST-7, ST-11, ST-12, ST-13, SP-15, SP-16, WR-1 and WR-2 were dropped in 2011.

Table 7-2 SURFACE WATER OPERATIONAL WATER QUALITY MONITORING

Field Measurements	**Reported As**
Flow	gpm
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Dissolved Oxygen	mg/l
Temperature	°C
Laboratory Measurements	**Reported As**
Total Dissolved Solids	mg/l
Total Suspended Solids	mg/l
Carbonate	mg/l
Bicarbonate	mg/l
Alkalinity, Total	mg/l
Hardness	mg/l
Calcium (Dissolved)	mg/l
Chloride	mg/l
Iron (Total)	mg/l
Iron (Dissolved)	mg/l
Magnesium (Dissolved)	mg/l
Manganese (Total)	mg/l
Manganese (Dissolved)	mg/l
Potassium (Dissolved)	mg/l
Sodium (Dissolved)	mg/l
Sulfate	mg/l
Oil and Grease	mg/l
Cations	meq/l
Anions	meq/l
Cation/Anion Balance	%

Table 7-3 GROUNDWATER OPERATIONAL WATER QUALITY MONITORING

Field Measurements	**Reported As**
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Temperature	°C
Laboratory Measurements	**Reported As**
Total Dissolved Solids	mg/l
Carbonate	mg/l
Bicarbonate	mg/l
Alkalinity, Total	mg/l
Hardness	mg/l
Calcium (Dissolved)	mg/l
Chloride	mg/l
Iron (Total)	mg/l
Iron (Dissolved)	mg/l
Magnesium (Dissolved)	mg/l
Manganese (Total)	mg/l
Manganese (Dissolved)	mg/l
Potassium (Dissolved)	mg/l
Sodium (Dissolved)	mg/l
Sulfate	mg/l
Cations	meq/l
Anions	meq/l
Cation/Anion Balance	%

Table 7-4 UPDES DISCHARGE POINT MONITORING

MONITORING POINTS	FREQUENCY
001	Monthly
002	Monthly
FIELD MEASUREMENTS	**REPORTED AS**
Flow	gpd
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Temperature	°C
LABORATORY MEASUREMENTS	**MAXIMUM**
Oil and Grease (if sheen is visible)	10 mg/l
Total Suspended Solids	70 mg/l
Total Iron	1.0 mg/l
Total Dissolved Solids	One ton/day

Table 7-5 UG-1 UNDERGROUND MONITORING POINT

MONITORING POINT	FREQUENCY
UG-1	Monthly

FIELD MEASUREMENTS	REPORTED AS
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Dissolved Oxygen	mg/l
Temperature	°C

LABORATORY MEASUREMENTS	REPORTED AS
Total Dissolved Solids	mg/l
Total Suspended Solids	mg/l
Iron (Total)	mg/l
Iron (Dissolved)	mg/l
Sulfate	mg/l
Alkalinity	mg/l

*Please refer to Appendix 5-15, Attachment 10 for a description and location of UG-1.

MONITORING POINT	FREQUENCY
U-14E	Monthly
U-15E	Monthly
U-16E	Monthly
U-17E	Monthly
U-18E	Monthly
U-19E	Monthly

FIELD MEASUREMENTS	REPORTED AS
Flow	gpm

*If the total cumulative flow from these meters exceeds 250 gpm (0.5 cfs) for a period of more than one month, the company will notify the Division and will initiate a hydrogeologic investigation and a subsequent revision of the PHC.

731.300

Based on testing of roof and floor materials, formation of acid- or toxic-materials does not appear to be a concern. Roof and floor materials will be permanently stored underground and will not brought to the surface for disposal.

Samples of the roof, floor and coal from an outcrop of the Lower Sunnyside coal seam in the left fork of C Canyon were collected for analyses. The samples were sent to Inter-Mountain Laboratories, Inc. in Sheridan, Wyoming and analyzed according to Table 6 in DOGM's "Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining". The Table 6 parameters were run on the samples to look for toxic or acid-forming materials. Refer to Appendix 6-1 for the laboratory analyses. The Table 6 sampling regime was intended for soil materials which are going to be used a plant growth medium during final reclamation. It is not likely that any significant amount of the roof, floor or coal material would be incorporated in the regraded fill material at the time of final reclamation because there will not be any coal processing or coal preparation at the minesite. Also, prior to reclamation of the minesite, all coal will be removed from the minesite and sold.

Chemicals and petroleum products to be used at the mine will be stored in a controlled manner. The following products may be used by mining operations: diesel fuel, gasoline, grease, motor oil, water based hydraulic fluid, antifreeze, brake fluid, gear lubricating oil, rock dust, magnesium chloride, spray paint and stopping sealant. Chemicals and petroleum products to be used at the mine will be stored in a controlled manner. Petroleum products such as diesel fuel, transmission oil and grease will be stored in the mine yard in a contained, concrete structure. Other miscellaneous products would be stored in the mine warehouse.

Emulsion fluid spills will be minimized through the following:

-Emulsion fluid will not be mixed on the surface. The emulsion concentrate is delivered to the minesite in factory sealed 500 gallon containers. These containers area specifically designed to be easily handled by standard equipment at the mine site and transferred to mobile equipment for transport underground near the longwall equipment.

-Most longwall installations now utilize a bio-degrade able emulsion fluid in accordance with the manufacturer's recommendations. The emulsion mixture is very dilute, typically 2 parts emulsion fluid to 98 parts water.

-Any accidental longwall fluid spills on the surface would be cleaned up like any other spill in accordance with the site specific Spill Prevention Control and Countermeasure Plan. The sediment pond cells would provide an

effective line of defense against any offsite contamination.

-Any emulsion fluid spill underground would go to an underground sump where water is typically stored and reused underground. Any water discharged from the mine would be tested and analyzed in accordance with the approve UPDES permit.

-The C Canyon drainage is ephemeral and supports no aquatic life. The closest flowing stream is Grassy Trail Creek which is over 11 miles to the southwest.

731.400 All water wells utilized during the operating phase will be abandoned in accordance with the rules outlined in "Administrative Rules For Water Well Drillers, State of Utah, Division of Water Rights, 1987". Closure of the wells will be conducted by a licensed well driller.

Final abandonment of the proposed water monitoring well DH 86-2 (at the mine site) will be conducted prior to completion of final reclamation. The abandoned well will be filled to within two feet of the surface with Neat Cement conforming to ASTM standard C150, a cement grout consisting of equal parts of cement conforming to ASTM standard C150 and sand/aggregate with no more than 6 gallons of water per sack of cement or bentonite-based products specifically designed for permanent well abandonment.

The cement will be introduced at the bottom of the well and placed progressively upward to within two feet of the surface. The casing will be severed a minimum of two feet below the ground surface. A minimum of two feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the state engineer by the responsible licensed driller giving data related to the abandonment of the well. The report shall be made on forms furnished by the state engineer and shall contain the information required, including but not limited to:

1) Name of licensed driller or other person(s) performing abandonment procedures,

2) Name of well owner at time of abandonment,

3) Address or location of well by section, township and range,

4) Abandonment materials, equipment and procedures used,

5) Water right or file number covering the well,

6) Final disposition of the well,

7) Date of completion.

731.500 Discharges

731.510 The West Ridge Mine will be operating in the Lower Sunnyside seam which is the same seam mined by Kaiser Sunnyside mine immediately to the southeast of the West Ridge reserves. WEST RIDGE intends to mine around old Sunnyside mine workings. There is a possibility that the old Sunnyside works may contain water, especially in the northeasterly areas which are the furthest down dip. WEST RIDGE Resources has acquired all of the most current certified mine maps of the Sunnyside old works. The Kaiser mining operation was a large operation with a sophisticated engineering, surveying and drafting department. WEST RIDGE Resources is confident that these maps were accurately surveyed and updated and accurately portray the extent of the old works. Nonetheless, extreme caution will be exercised as mine development is being driven out toward the old works. WEST RIDGE Resources will employ professional licensed, certified land surveyors to monitor the progress of the underground mine development. All surveying in the West Ridge mine will be tied to the same surveying coordinates and control as was used for the Sunnyside mine. When the West Ridge works are within 500 feet of the projected Sunnyside works exploratory drilling will begin ahead of the development. Face drills will be used to drill at least 100 feet out in advance of the actual mine face development. The exploratory face drill will be a small diameter and if water is encountered from the old works the drill hole can easily be plugged and sealed. The West Ridge mine plan assumes that development will proceed to within 300 feet of the old works. West Ridge mine intends to stay away from the old works but will drill ahead as a precautionary measure in the event that the mine maps or surveying has a margin of error.

731.520 Gravity Discharges From Underground Mining Activities

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, the discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area.

Refer to Map 6-2, Coal Seam Structure Map for the Lower Sunnyside seam structure contours.

731.520 Gravity Discharges From Underground Mining Activities

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, the discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area.

Refer to Map 6-2, Coal Seam Structure Map for the Lower Sunnyside seam structure contours.

731.600 Stream Buffer Zones

The natural drainage channels in the main C Canyon and right fork of C Canyon drainage are classified as intermittent by the regulatory definition. (The watershed area is greater than one square mile). The channel operates like a ephemeral drainage channel although no drainage flow in the channel has been recorded during the last two years of monitoring.

A buried culvert will be placed through the proposed disturbed area to convey drainage from precipitation events past the mine site. The undisturbed bypass culvert system will be sized to handle runoff from the 100 year, 6 hour precipitation event. This is well in excess of the 10 year, 6 hour design event required by the regulations for a temporary diversion. The larger culvert is being proposed as an extra measure of safety and protection for the mineyard. Stream buffer zone markers will be placed at the north and south ends of the mine site facility area above the drainage channel to prevent channel disturbance by surface operations.

Mining activities will minimize impact to the undisturbed area by use of

diversion ditches and the sediment pond to control and contain sediment and disturbed area runoff within the mineyard facility area.

It was determined by the Division of Water Rights that no stream alteration permit would be required for culverting of the C Canyon drainage. Refer to the August 19, 1998 letter included in Appendix 7-9.

The proposed undisturbed drainage channel diversion is discussed in greater detail under R645-301-742.300 and in Appendix 7-4.

Grassy Trail Creek is an intermittent stream located in the permit area in Whitmore Canyon located northeast of West Ridge. In this area the coal seam to be mined is 2000' below the streambed. Technically speaking, mining will be conducted within the 100' stream buffer zone, but only as measured horizontally. Therefore, no stream buffer zone protection measures on the surface are anticipated. In the "Investigation of Surface Water and Ground Water Systems in the Whitmore LBA Area, Carbon County, Utah" (Appendix 7-1A), Mayo and Associates concludes that "the stream channel in this area is underlain by approximately 2,000 feet of cover, which includes the entire thickness of relatively unfaulted and unfractured North Horn Formation, which is known to form an effective barrier to vertical groundwater migration (Mayo and Associates, 1998) and is known to contain hydrophyllic clays that swell when wetted to seal any fractures that may form. Therefore, the potential for the interception and diminution of surface water flows in Grassy Trail Creek as a result of mining induced subsidence is minimal." Mining related impacts to fish, wildlife and other hydrologic resources is expected to be correspondingly minimal.

731.700 Cross Sections and Maps

There is no flowing surface water within the permit area and no water supply intakes. Surface receiving waters are at least ten miles to the southwest where the ephemeral drainage system reaches Grassy Trail Creek near the Sunnyside Junction (junction of Highway 123 and State Road 6). Refer to Map 1-1 for the location of Grassy Trail Creek. All disturbed area runoff will flow into the sediment pond where it will be contained.

The location of the water monitoring well, the water supply pipeline from East Carbon and the water storage tanks to be used are shown on Map 5-5.

Water monitoring stations and water monitoring well DH 86-2 are shown on Map 7-6. Operational monitoring stations are depicted on Map 7-7 "Operational Monitoring Map". Refer to Table 7-1 for a listing of the operational monitoring locations.

Map 5-5 shows the location of the proposed sediment pond.

Cross sections for the proposed sedimentation pond are presented on Map 7-4A "Sediment Pond Cross-Sections".

731.800 Water Rights and Replacement

No surface coal mining and reclamation activities (strip mining) will occur in the affected permit area.

Mining should not have any impact on the existing water rights in and around the proposed mining area.

R645-301-732 SEDIMENT CONTROL MEASURES

732.100 Siltation structures will be constructed and maintained in accordance with the applicable regulations. Siltation structures will not be removed until authorized by the Division of Oil, Gas and Mining.

Alternative sediment control measures will be used in areas where the surface disturbance is minor and sediment control is expected to be restored fairly rapidly with revegetation. Alternate sediment controls will be used on the topsoil stockpile and test plot areas. At these locations diversion ditches will divert undisturbed area runoff away from the site. Silt fencing will be utilized to minimize siltation from the sites. The surface of the stockpile will be pocked and roughened to retain moisture and minimize runoff from the disturbed surface. The surface area will be revegetated to minimize surface erosion. The alternate sediment control area located in the right fork is 0.46 acres while the stockpile area for the left fork is 1.13 acres.

The other ASCA (alternate sediment control area) will be at the office and parking lot area below the mine yard facility area. This 1.37 acre area will be sloped to one end of the pad area where a sediment retention basin will be used for sediment control. In addition, the slopes and embankment of the office pad will be revegetated to control sedimentation and erosion.

732.200 The sedimentation pond has been designed in compliance with the appropriate regulations. Refer to Maps 7-4 and 7-4A for the sediment pond plan and cross-section details. The sediment pond will be reclaimed during reclamation of the mineyard facilities. Refer to Appendix 5-5 for the complete details of the reclamation plan.

732.300 Diversions will be constructed and maintained with respect to R645-301-742.100 and 742.300.

732.400 Road Drainage

Roads within the disturbed area will be designed and constructed to utilize standard designs for surface drainage control, culvert size and spacing and grade. Refer to Map 5-5, Surface Facility Map.

Drainage ditches and culverts have been designed to handle a 10 year, 24 hour storm event. The larger design capacity will also provide additional capacity above what is required by the regulations, for a greater margin of safety in the mineyard during operations.

Riprap will be placed around the inlet end of the culverts to a height of at least 6" above the required headwall for each culvert. The outlet of the main

canyon bypass culvert will be equipped with adequately sized riprap to slow the outlet velocity and prevent erosion to the natural downstream channel.

Trash racks will be placed on all undisturbed bypass culvert inlets to prevent floating debris and rocks from plugging the culvert. The trash racks will be slanted 3/4 inch steel bars welded on six inch centers across the flared inlet structures of each culvert. The bars will be sloped from the front of the inlet up to the top of the culvert. Use of trash racks on the smaller culverts within the mine yard drainage system will be at the discretion of the operator and based on site specific conditions.

R645-301-733 IMPOUNDMENTS

733.100 General Plans

A sediment impoundment structure (sediment pond) is proposed for treatment of disturbed area runoff from the mineyard facility area. The pond will be located near the southern end of the mine yard (refer to Map 5-5) and has been designed to contain and treat drainage from the 10 year, 24 hour event. The associated conveyance structures, such as culverts and ditches, have been sized to convey drainage from the 10 year, 24 hour event into the sediment pond. Appendix 7-4 provides the detailed designs and calculations used to derive the pond capacity, ditch and culvert sizes.

733.110 The designs and calculations have been certified by a registered, professional engineer experience in the design and construction of sediment ponds.

733.120 Maps 7-4 and 7-4A depict the pond design in plan view and in cross-section. Calculations made in Appendix 7-4 are based on the design dimensions presented in the above-mention maps.

733.130 The sediment pond has been designed to contain runoff from the mineyard disturbed area as well as several contributing undisturbed drainage areas. The runoff and sediment yield have been calculated using a 10 year, 24 hour precipitation event. Because of the narrowness and steep gradient of the canyon at the downstream end of the mine yard facility area, the sediment pond has been designed to have two cells that will contain the total volume of the 10 year, 24 hour design event plus three years of sediment storage (using 0.1 acre-feet of sediment per disturbed acre). Sediment will be captured by both cells (A and B). The total sediment storage capacity of the sediment pond for a three year interval is 1.845 acre feet, however, the sediment will be cleaned out when the storage capacity reaches 60%. Sediment indicator stakes will be placed at various locations in both the upper and lower cells (A and B) so that a visual determination of the 60% level can be made.

The required volume for the sediment pond is calculated at 7.052 acre feet, including 3 years of sediment storage. The actual pond volume at the principal spillway is 7.669 acre-feet. Refer to Appendix 7-4 for the pond design calculations. Refer to Map 7-4 for the individual cell dimensions and features. The upper cell will be approximately 18.5' feet deep from the cell bottom to the crest of the embankment while cell B will be approximately 14' feet deep. Neither of the cells meet the size specifications that require them to be regulated by MSHA under 30 CFR 77.216(a).

The pond will provide a theoretical detention time of 24 hours. The upper cell (cell A) of the sediment pond will be constructed with an open channel spillway at a minimum depth of 1.5' below the top of the dam. The open-channel spillway will be constructed of grouted rip-rap or concrete, and will have a minimum 5' bottom width with 2h :1v side slopes. The lower cell (cell B) will be constructed with a combination of 2 spillways. The principal spillway will be a 36" C.M.P. culvert riser and oil skimmer. This spillway will overflow at an elevation at least 3' below the top of the dam. This spillway will discharge directly into the bypass culvert (UC-OO) which is located beneath the pond. In the unlikely event of failure of the principal spillway, the lower pond cell will also be equipped with a second (emergency) culvert spillway, consisting of a 36" C.M.P. culvert riser and oil skimmer, with a minimum depth of 2.0' below the top of the dam. This spillway will also flow directly into the undisturbed bypass culvert (UC-OO).

Discharge from the pond will be in accordance with the UPDES permit issued for the facility. Decanting the pond will be accomplished by using a portable submersible pump with an inverted inlet to decant the pond if necessary. A sample will be collected prior to decanting to determine if the water quality will meet the requirements of the UPDES permit.

UPDES sample point # 1 is located at the principal spillway of the sediment pond. (see Map 7-4). This sample point will be used if and when the pond fills to capacity and must be decanted. Access to this sampling point will be provided by a walkway which will be constructed from the crest of the pond embankment out to the primary spillway. This walkway will be substantially constructed of steel, with an expanded metal walk surface and adequate handrails. It will be attached to the steel structure of the primary spillway /oil skimmer structure. During discharge activities personnel in charge of the sampling will walk to the end of the walkway to collect samples

Decanting of this pond will be done manually using a small mobile gasoline powered pump. When used, the pump will be positioned on the spillway walkway, (see Map 7-4). The end of the suction hose will be equipped with a float so that the decanted water is sucked from the top layer of pond water

which should contain less sediment. The discharge line of the pump will feed directly into the primary spillway. Mine personal will take samples at the discharge end of the pump line as it enters the principal spillway. Samples will be secured and analyzed in accordance with the approved UPDES permit.

UPDES sample point #2 is located at the culvert riser near the mine portals. This riser leads directly into the main bypass culvert. The riser will be 42" in diameter, large enough to allow access by mine personnel. The purpose of UPDES sample point #2 is to sample any water that may be discharged from the mine in the future. It is not known at this time if or when such discharge may be necessary. However, if mine discharge becomes necessary, a discharge line (most likely 6" to 8" diameter) would be installed in the return entries (to keep from freezing) and would exit the mine through the fan portal. From the fan it is a short distance over to the culvert where the line would discharge directly into the main bypass culvert riser the discharge line will be equipped with a small petcock value that will conveniently allow the operator to take a UPDES sample whenever water is being discharged from the mine. Samples will be secured and analyzed in accordance with the approved UPDES permit. Refer to Appendix 7-10 for the UPDES general permit.

Inlet ditches to the pond will be protected from erosion by using concrete, culverts or rip rap to convey drainage down to the water level.

The principal spillway in cell B will be a 36" cmp culvert fitted with an oil skimmer. This spillway will carry the peak flow from the 25 year, 6 hour event at a depth of 0.89' over the pipe.

The emergency spillway, located on cell B, will also be a 36" cmp culvert fitted with an oil skimmer. This spillway will be utilized, if necessary, to convey any flow in excess of the 25 year, 6 hour precipitation event out of the pond.

The sediment pond is a temporary feature. It will be removed during final reclamation of the mine site.

733.140 No previous mining has occurred under the sediment pond location, nor is mining proposed under that site. Therefore, there should be no effect on the sediment pond due to past or future mining activities.

The pond will be constructed according to design criteria listed in Appendix 7-4 under "Design and Construction Specifications For Sedimentation Pond". The sediment pond will be removed upon cessation of mining.

733.150 A structural stability analysis was performed on the pond embankment slopes by Agapito Associates, Inc. The results of their analysis are presented in

Appendix 5-4.

The pond embankment (the east slope of the pond) will be keyed into bedrock or natural ground. The bedrock appears to be competent at this location with no visible faults or fractures that would impair the operation and stability of the pond.

733.160 A certified sediment and drainage control plan containing design details (Appendix 7-4) is presented in this permit application package.

733.200 Permanent and Temporary Impoundments

Maps and cross-sections for the sediment pond have been prepared and certified. Refer to Maps 7-4 and 7-4A. Details of the pond design are presented in Appendix 7-4.

The sediment pond will collect runoff from the disturbed area during mining operations. Because the pond is a temporary structure, it has been sized according to requirements for the 10 year, 24 hour storm event. The calculated required volume for this storm event is 7.052 acre-feet, which includes a volume for three years of sediment storage. The actual design volume for the pond is 7.669 acre-feet. The pond will have a principal and emergency spillway in cell B. The maximum pond volume will be 7.669 acre-feet at the principal spillway and the maximum height water could be impounded in either of the cells is 16.5 feet (to the principal spillway in cell A). The pond therefore does not meet the criteria for MSHA regulation.

In addition to the principal spillway, the pond's emergency spillway has also been designed to safely pass the peak flow from the 25 year, 6 hour precipitation event. Any discharge from this pond will meet the requirements of the UPDES permit for the facility.

No mining will occur underneath the sediment pond nor has any mining been done beneath this location in the past. The potential effect on the structure from subsidence of subsurface strata would be nonexistent.

This temporary impoundment will be constructed and maintained to comply with the appropriate requirements. No permanent impoundments are being proposed. Reclamation of the structure will be as presented in the reclamation portion of Chapters 5 and 7 and in Appendix 5-5, Construction and Reclamation Plan.

R645-301-734 DISCHARGE STRUCTURES

Discharge structures will be constructed and maintained to comply with R645-301-744. Refer to the discussion under R645-301-744.

R645-301-735 DISPOSAL OF EXCESS SPOIL

No areas are presently designated for disposal of excess spoil. No excess spoil is anticipated during the life of the mine.

R645-301-736 COAL MINE WASTE

No coal mine waste disposal areas are being planned in the mine yard. Any waste generated will be disposed of in an approved, permitted disposal site.

R645-301-737 NONCOAL MINE WASTE

Noncoal mine waste will be stored in dumpsters, or in a contained manner, in a designated portion of the disturbed area near the shop/warehouse. Final disposal of noncoal mine waste will be in an approved, waste disposal site and will comply with R645-301-747.

R645-301-738 TEMPORARY CASING AND SEALING OF WELLS

Sealing of the groundwater monitoring well and any future wells will comply with R645-301-748. Refer to R645-301-765 for the well abandonment plan. The groundwater monitoring well will be used for monitoring only and is locked in a closed position between sampling events.

R645-301-740 DESIGN CRITERIA AND PLANS

Site specific plans that incorporate design criteria for control of drainage from disturbed and undisturbed areas are presented below.

R645-301-742 **SEDIMENT CONTROL MEASURES**

Sediment control measures have been designed to prevent, to the extent possible, additional contributions of sediment to stream flow or runoff outside the permit area, to meet effluent limitations and to minimize erosion.

The most significant sediment control measure will be to collect all disturbed area runoff and divert it into a sediment pond designed for total containment of the 10 year, 24 hour precipitation event. Runoff from undisturbed areas above the mining site will be diverted, as much as possible, to reduce the amount of runoff to be treated by the sediment pond. Refer to Appendix 7-4 for the "West Ridge Mine Sedimentation and Drainage Control Plan" and Map 7-1 "Drainage Area Map " and Map 7-2 "Mine Site Drainage Map" for the mine site drainage calculations and diversion culvert specifications.

Additional measures to be taken may include: interim reclamation of disturbance, where practical, to reduce runoff and erosion; rip rapping or lining diversion ditches, where necessary, to reduce erosion; and using straw bales and check dams to control flow, sediment and erosion. A discussion of alternate sediment controls measures is presented in Appendix 7-4 for the ASCA areas (topsoil stockpile, test plots and office pad). Designs for the sediment controls will be according to information presented in Appendix 7-4 and Maps 5-5, 5-8, 7-1, and 7-4.

Snow removal activities at the mine site will attempt to stockpile any large amounts of snow in those snow storage site locations indicated on Map 7-2. The snow stockpile locations are primarily designed for storing snow clear from some of the larger pad areas. Snow will still be plowed to the side of roadways and small pad areas.

742.220 Minimizing contributions of suspended solids and sediment to streamflow or runoff outside the permit area will be accomplished by constructing a multiple cell sediment pond for sediment treatment and storage of runoff from the disturbed area. The sediment pond has been designed to provide adequate sediment storage and detention time for the 10 year, 24 hour precipitation event. The pond has a principal and emergency spillway in cell B which is designed to pass the peak flow from the design event as required by the regulations. The design of both the principal and emergency spillways will accommodate the peak flow of 23.71 cfs from a 25 year, 6 hour event.

Water will be decanted in accordance with the UPDES permit for the facility. A submersible pump will be used to decant the pond if needed.

The sediment in the pond cells will be removed when it reaches 60% of the maximum design sediment level in cells A and B of the pond. Two sediment

markers will be installed at various locations in the bottom of the cells for evaluation of the sediment level. Refer to Map 7-4 for information regarding the sediment pond configuration. Refer to Appendix 7-4 for the "West Ridge Mine Sedimentation and Drainage Control Plan" for design calculations.

The sediment pond cell will be cleaned out upon reaching the 60% of the maximum sediment capacity. Clean out will be done during late fall or early winter, October-December, when the chance of thunderstorms is the lowest and the pond is dry. Decanting of the pond prior to cleanout will probably be unnecessary due to the arid nature of the climate. However, if decanting is necessary, the water will be allowed to settle for a minimum of 24 hours. The water will be drawn down as much as possible by pumping it into the adjacent cell.

Prior to sediment removal, samples will be taken from the sediment on the bottom to determine the depth of sediment as well as the nature of the material to be removed. Samples will be composited and analyzed according to Table 6 of DOGM's "Guidelines For Management Of Topsoil And Overburden For Underground And Surface Coal Mining".

The sediment pond does not meet the size criteria of MSHA 30 CFR 77.216(a).

The sediment pond has been designed with a primary and emergency spillway each capable of safely discharging the peak flow from the 25 year, 6 hour precipitation event. This should provide an additional measure of safety to prevent damage to the pond's integrity.

The construction site for the sediment pond will be cleared of all vegetation and debris prior to the removal of topsoil. Topsoil, if present, will be removed from the pond site and stockpiled in the topsoil storage area. In areas where fill is to be placed for the pond impoundment, natural ground will be removed for at least 12" below the base of the structure. Native material will be used when possible. The fill will be placed in lifts not to exceed 15" and compacted. Compaction of the fill material will be 95% or greater. Silt fencing and straw bales will be used to treat drainage from the site until the sediment pond embankment is constructed.

742.300 Diversions

General Requirements

Flow from undisturbed areas will be diverted away, where possible, from disturbed areas by means of temporary diversions (i.e. undisturbed drainage culverts). The diversions have been designed to minimize impacts to the

hydrologic balance of the permit and adjacent areas.

All of the undisturbed drainage diversions (bypass culverts) have been sized, as a minimum, to meet the 100 year, 6 hour event for maximum protection of the mine yard area, sediment pond and undisturbed drainage below. The design incorporates structural stability and protection against flooding and damage to life and property. Designs for all diversions are presented in Appendix 7-4 and the structure locations depicted on Map 7-1. The map and plan have been certified by a registered, professional engineer.

The sediment pond has been designed and located such that if any of the temporary drainage structures (disturbed area culverts and ditches) within the disturbed area were to exceed their capacity, all drainage would still flow to and be treated by the sediment pond. Four culverts will convey drainage into the sediment pond. These inlets, have been designed to pass the flow from a 10 year, 24 hour precipitation event in order to provide more capacity and an extra measure of protection.

Following completion of mining activities, the undisturbed drainage diversion culverts, which will bypass the undisturbed drainage past the disturbed area, will be removed and the natural channel restored. Restoration of the channel will seek to reestablish a natural appearance to the drainage channel while providing a suitable channel configuration. Refer to Appendix 5-5 for a detailed discussion of the reclamation plan for the C Canyon drainage channel.

Based on measurements taken during field investigations and baseline mapping in the mine yard area, it will be possible to restore the channel to a configuration similar to what exists at the present time (pre-disturbance). Refer to Map 5-1 which is the existing topography of the site. Refer to Map 5-9, Mine Site Reclamation, for the proposed channel alignment and configuration.

Vegetation surveys conducted during June and August of 1997 confirm that there is no riparian zone in the existing drainage channels. Refer to Appendix 3-1 in Chapter 3 for information regarding vegetation of the mine site area.

742.400 Road Drainage

Roads within the disturbed area will be designed and constructed to provide environmental protection and safety and will adequately provide for surface drainage control, sufficient culvert design and spacing.

The placement of the road will seek to minimize downstream sedimentation and disturbance to the road due to runoff. The road will be located on the most stable available surface.

Primary Roads

Drainage structures on the road within the mineyard will be designed and constructed to pass the peak runoff from a minimum of a 10 year, 24 hour precipitation event.

Culverts will be designed so as to avoid plugging, collapse or erosion at the inlets and outlets. Trash racks will be installed where deemed appropriate by the operator.

The culvert calculations for the C Canyon county road culvert located within the disturbed area are provided in Appendix 7-8 C Canyon Road Station 406+70 - Culvert Sizing. The culvert was sized for a 25 year storm using the UDOT Small Area Method, the same method used to size the other culverts on the C Canyon road as well.

Following mining activities, the channel will be completely restored by removing the mine yard pad fill and regrading slopes to approximate original contour. In topsoiled areas, the channel will be reestablished by removing the geotextile fabric once the pad fill has been removed. Below the geotextile will be the original channel materials in their original arrangement. The restored channel will merge with the undisturbed downstream drainage southwest of the mine office area. The gradient of the channel and the side slopes will be similar to the premining channel.

No riparian area exists along the present drainage channel. The proposed seed mix to be used for final reclamation will incorporate species that presently exist in and adjacent to the channel area. The seed will be applied to the regraded channel side slopes by hydroseeding or hand broadcasting and raking. Containerized plants would also be planted along specified portions of the reclaimed channel.

R645-301-743 IMPOUNDMENTS

The proposed sediment pond is less than the size criteria listed in MSHA, 30 CFR 77.216(a). It has been designed and certified according to R645-301-512. Since the impoundment (sediment pond) is a temporary structure, regulations require the principal and emergency spillway to be designed to safely pass the 25 year, 6 hour precipitation event.

The impoundment will be inspected as described under R645-301-514.300.

R645-301-744 DISCHARGE STRUCTURES

Discharge from the sediment pond and bypass culvert will be controlled by riprap energy dissipators below the outlet ends downstream from the culvert outlet. The calculations and design specifications for the spillway are presented in Appendix 7-4.

R645-301-745 DISPOSAL OF EXCESS SPOIL

No areas are presently designated for disposal of excess spoil. No excess spoil is anticipated during the life of the mine. Refer to the discussion in Chapter 5, section R645-301-553 under Spoil and Waste (553.200).

No valley fills or head-of-hollow fills are being proposed.

No durable rock fills are included in the operation plan.

R645-301-746 COAL MINE WASTE

No coal mine waste piles are being proposed.

R645-301-747 DISPOSAL OF NONCOAL MINE WASTE

Noncoal mine waste, including but not limited to grease, lubricants, paints, flammable liquids, garbage, machinery, lumber and other combustible materials generated during coal mining and reclamation operations will be placed and stored in a controlled manner at the designated location near the shop/warehouse, (see Map 5-5) within the disturbed area or in a state-approved solid waste disposal area. No noncoal waste will be permanently disposed of within the permit area. Dumpsters will be used for collection and disposal of trash.

Lubricants, solvents, and grease will be stored in a covered area with limited access to prevent accidental contact from machinery. The storage area will be in the vicinity of the shop/warehouse. Any leakage at the fuel storage site will be contained within concrete lined or steel containment structures. Surface runoff will be diverted away from the storage site. Should any uncontrolled discharge of oil or petroleum products occur within the general mine yard area, the sediment pond would act as a last line of defense for the containment of any such spills and prevent flow into the natural drainage system. A Spill Prevention Control and Countermeasure (SPCC) Plan will be posted at the shop/warehouse.

A dumpster will be placed in a convenient location for disposal of nonhazardous trash. Used/broken equipment will be stored within the storage area of the mine yard. As the entire storage area reports to the sediment pond, the exact location of storage will be left to the discretion of the operator as long as the storage of materials does not block ditches or roadways.

R645-301-748 CASING AND SEALING OF WELLS

The water monitoring well (DH86-2) will be cased, sealed or plugged to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized.

Upon completion of monitoring activities, the groundwater monitoring well will be permanently sealed by filling the hole with cement to within two feet of the top of the hole. Two feet of compacted native material will be placed above the sealed hole and the area reseeded.

Any future water or monitoring wells will be abandoned in a similar manner.

R645-301-750 PERFORMANCE STANDARDS

All mining and reclamation operations will be conducted to minimize disturbances to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and support approved postmining land uses.

R645-301-751 WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS

WEST RIDGE Resources, Inc. has obtained a UPDES discharge permit to cover any possible discharge from the sediment pond. Refer to Appendix 7-10.

R645-301-752 SEDIMENT CONTROL MEASURES

Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760.

752.100 Siltation Structures and Diversions

Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763.

752.200 Road Drainage

Any roads within the disturbed area will be located, designed, reconstructed and maintained to control erosion, minimize contributions to stream flow, minimize diminution of the surface and ground water systems and refrain from significantly altering the normal flow of water in the drainage channel in accordance with R645-301-732.400, R645-301-742.400 and R645-301-762.

Drainage for the roads within the mine yard disturbed area has been addressed in Appendix 7-4 under culvert and ditch designs. The road configuration is presented on Map 5-5.

R645-301-753 IMPOUNDMENTS AND DISCHARGE STRUCTURES

Impoundments and discharge structures will be located, maintained, constructed and reclaimed to comply with R645-301-733, R645-301-734, R645-301-743, R645-301-745 and R645-301-760.

R645-301-754 DISPOSAL OF EXCESS SPOIL, COAL MINE WASTE AND NONCOAL MINE WASTE

Disposal for coal mine waste and noncoal mine waste will be located, maintained, constructed and reclaimed as described in R645-301-735, R645-301-736, R645-301-745, R645-301-746, R645-301-747 and R645-301-760.

R645-301-755 CASING AND SEALING OF WELLS

All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738

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R645-301-760 RECLAMATION

R645-301-761 GENERAL REQUIREMENTS

All temporary structures will be removed and reclaimed before bond release is sought. The restored channel will follow the grade, alignment and sinuosity of the original natural channel. Suitable riprap already existing in the stream channel will provide adequate protection against erosion, as demonstrated by the stability of the existing natural channel.

R645-301-762 ROADS

The access road is a Carbon County public road and will be left in place and maintained by Carbon County. A turnaround will be left at the end of the road.

R645-301-763 SILTATION STRUCTURES

Siltation structures will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated.

When the sediment controls are removed, the land on which the siltation structures are located will be regraded and revegetated. Refer to Chapter 5 for the regrading plans of siltation structures and Chapter 3 regarding the revegetation plan for reclamation.

R645-301-764 STRUCTURE REMOVAL

Appendix 5-1 presents a detailed timetable and outline for the removal of all structures on the minesite area. Removal of the siltation structures will be contingent upon DOGM approval. The sediment pond will be removed in conjunction with the reclamation of the mine yard.

R645-301-765 PERMANENT CASING AND SEALING OF WELLS

Permanent closure of the monitoring well 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights.

The abandoned well will be filled to within two feet of the surface with Neat Cement conforming to ASTM standard C150, a cement grout consisting of equal parts of cement conforming to ASTM standard C150 and sand/aggregate with no more than 6 gallons of water per sack of cement or bentonite-based products specifically designed for permanent well abandonment.

The cement will be introduced at the bottom of the well and placed progressively upward to within two feet of the surface. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the state engineer by the responsible licensed ,driller giving data related to the abandonment of the well. The report shall be made on forms furnished by the state engineer and shall contain the information required, including but not limited to:

1) Name of licensed driller or other person(s) performing abandonment procedures,

2) Name of well owner at time of abandonment,

3) Address or location of well by section, township and range,

4) Abandonment materials, equipment and procedures used,

5) Water right or file number covering the well,

6) Final disposition of the well,

7) Date of completion.

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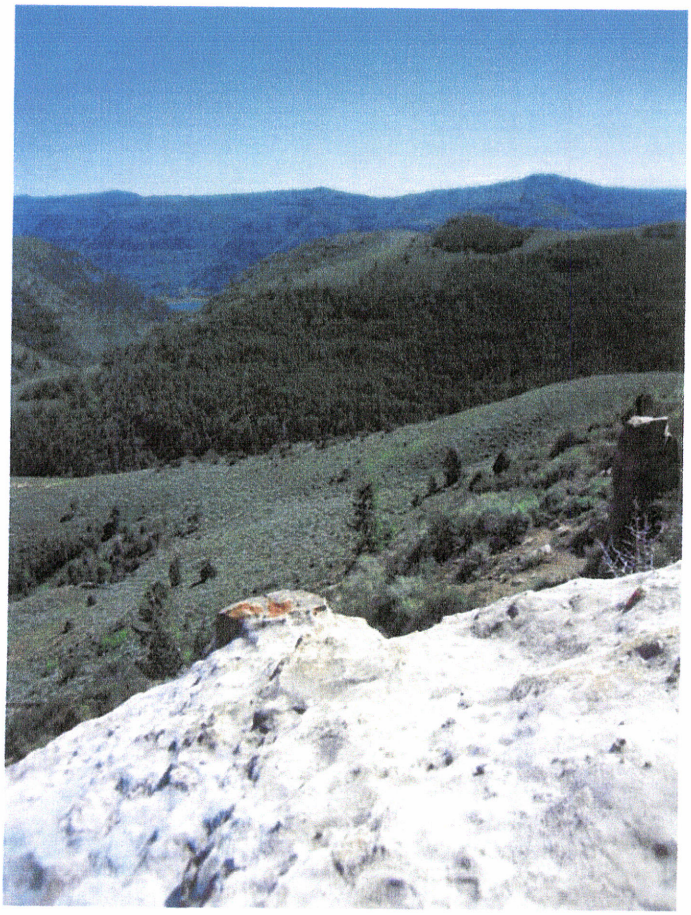
APPENDIX 7-6B.....2011 SPRING & SEEP DATA

APPENDIX 7-6B

2011 SEEP & SPRING SURVEY DATA

Report of Spring and Seep Survey in the Right Fork of Whitmore Canyon Area

West Ridge Mine, Carbon County, Utah



3 August 2011

West Ridge Resources, Inc.
West Ridge Mine
East Carbon, Utah

PETERSEN HYDROLOGIC, LLC
CONSULTANTS IN HYDROGEOLOGY

Report of Spring and Seep Survey in the Right Fork of Whitmore Canyon Area

West Ridge Mine, Carbon County, Utah

3 August 2011

West Ridge Resources, Inc.
West Ridge Mine
Carbon County, Utah

Prepared by:

Erik C. Petersen, P.G.
Senior Hydrogeologist
Utah P.G. No. 5373615-2250

PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

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PETERSEN@RELIA.NET

Report of Spring and Seep Survey In the Right Fork of Whitmore Canyon Area, West Ridge Mine Carbon County, Utah

1.0 Introduction

West Ridge Resources, Inc operates the West Ridge Mine, located in B Canyon in the Book Cliffs coal field approximately 4 miles north of the town of East Carbon, Utah. In association with a proposed expansion of the West Ridge Mine permit area in the Right Fork of Whitmore Canyon, Petersen Hydrologic, LLC has conducted a spring and seep survey in the area. This report summarizes the results of the spring and seep survey.

Including this introduction, this report contains the following sections:

1. Introduction
2. Methods of Study
3. Presentation of Data
4. Photographs Section

2.0 Methods of Study

Survey Area

The extents of the spring and seep survey area are shown on Figure 1. The survey area is located in the Right Fork of Whitmore Canyon drainage and encompasses portions of Sections 31 and 32, Township 13 South, Range 14 East, and Sections 5 and 6, Township 14 South, Range 14 East.

Spring and Seep Identification

The spring and seep survey was performed by traversing the study area by foot on 23 June 2011 and 14 July 2011. Spring DZP-1 was identified in a previous spring and seep survey on 20 August 2010. At each location measurements of discharge, temperature, pH, and specific conductance were performed. Spring and seep areas were digitally photographed.

Spring and Seep Location

Spring and seep locations were determined in the field using a Garmin GPSmap 60CSx hand-held GPS unit. Locations are reported in the UTM, Zone 12, NAD 27 coordinate system. The spring and seep locations were then plotted on a USGS 7.5 minute topographic base using AllTopo7 mapping software.

Discharge Measurements

Discharge measurements for springs were performed using a calibrated container and a stopwatch. Generally, spring discharge measurements were performed by damming and diverting the spring discharge through a pipe. Using an appropriately sized container, time-to-fill measurements were typically performed at least 3 times at each location. An average time-to-fill value was used to calculate the reported discharge measurement.

Discharge Temperature Measurements

Temperature measurements were performed using a Taylor brand electronic digital thermometer. Discharge temperature measurements were performed as close to the spring discharge locations as possible.

Specific Conductance Measurements

Specific conductance measurements were performed using an Extech brand model EC400 conductivity meter with automatic temperature compensation. The instrument was regularly calibrated using NIST traceable conductivity standard solutions.

pH Measurements

pH Measurements were performed using an Oakton model pH Testr 30 with automatic temperature compensation. The instrument was regularly calibrated using NIST traceable pH standard solutions.

3.0 Presentation of Data

Identified spring and seep locations are plotted on a 7.5 minute USGS topographic base map in Figure 1. Discharge data and field water quality parameters (temperature, pH, and specific conductance) for each identified spring and seep are reported in Table 1. Information on geologic occurrence and usage are also presented in Table 1. Photographs of spring areas are provided in the photograph section at the end of this report.

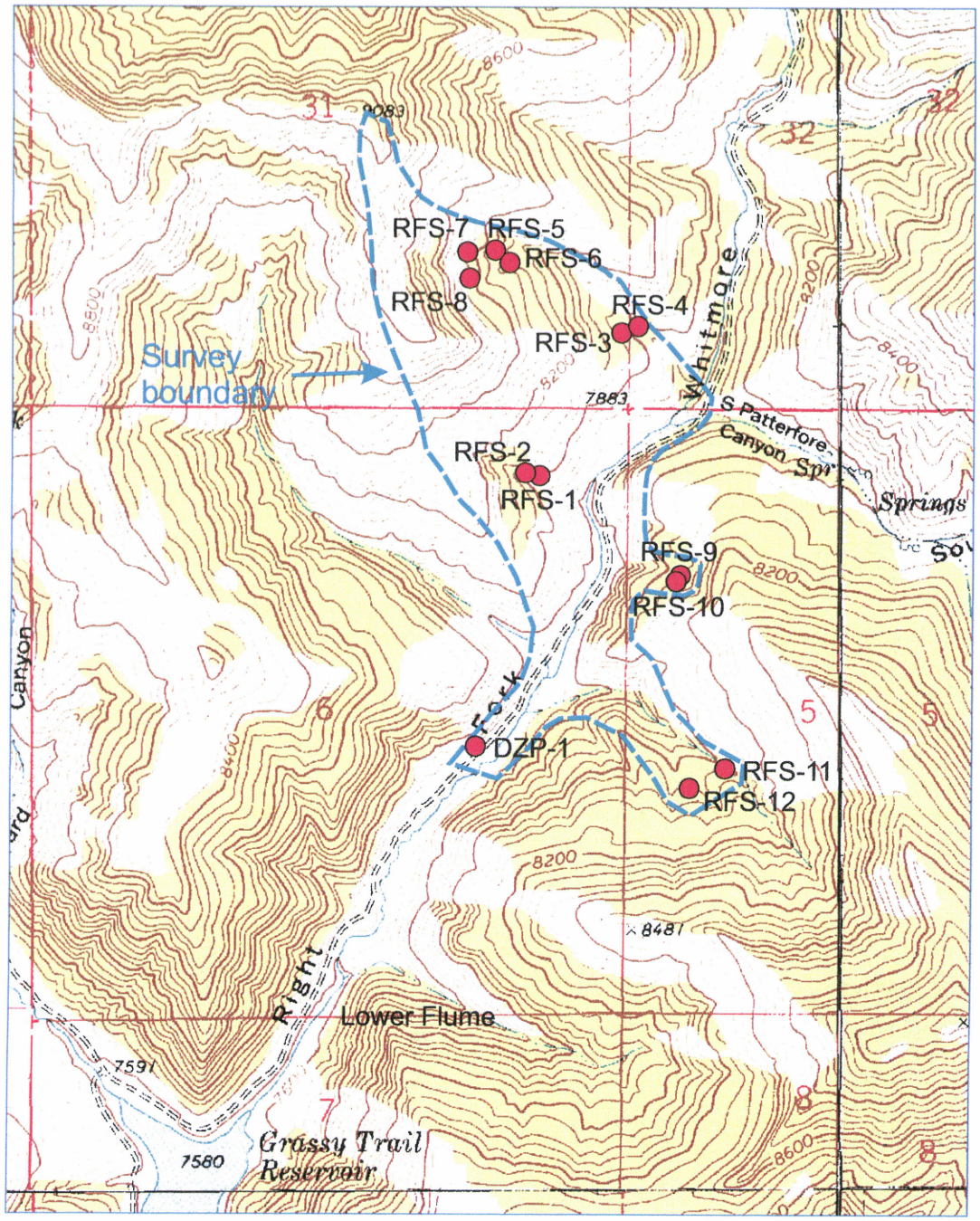

Figure 1 Spring and seep locations.

Table 1 Spring and seep survey information.

	Date	Location (UTM, Z12, NAD 27)		Q (gpm)	T (°C)	pH	Cond (µS/cm)	Geologic formation	Use
RFS-1	14-Jul-11	552837	4387995	0.22	13.2	7.68	541	Colton Formation	wildlife, no development
RFS-2	14-Jul-11	552790	4388012	<0.1	—	—	—	Colton Formation	none apparent
RFS-3	14-Jul-11	552994	4388422	0.84	9.1	7.73	1058	Colton Formation	wildlife, no development
RFS-4	14-Jul-11	553087	4388417	13.8	23.6	8.38	1,004	Colton Formation	wildlife, no development
RFS-5	14-Jul-11	552709	4388614	0.99	11.4	7.76	988	Colton Formation	wildlife, no development
RFS-6	14-Jul-11	552740	4388575	1.03	9.2	7.67	1,015	Colton Formation	Spring area fenced, stockwatering
RFS-7	14-Jul-11	552641	4388606	12.9	7.7	7.79	894	Colton Formation	wildlife, no development
RFS-8	14-Jul-11	552630	4388533	6.31	7.8	7.72	874	Colton Formation	wildlife, no development
RFS-9	14-Jul-11	553210	4387743	3.90	5.9	7.57	934	Colton Formation	wildlife, no development
RFS-10	14-Jul-11	553204	4387735	2.75	5.8	7.55	930	Colton Formation	wildlife, no development
RFS-11	23-Jun-11	553321	4387230	32.5	8.6	7.90	811	Colton Formation	Stockwatering/wildlife, fenced area
RFS-12	23-Jun-11	553238	4387181	2.13	13.3	7.69	774	Colton Formation	wildlife, no development
DZP-1	20-Aug-10	552670	4387288	0.44	13.5	7.44	764	Colton Formation	wildlife, no development
	23-Jun-11			1.44	7.9	7.80	752		

4.0 Photographs Section

RFS-1

RFS-2

RFS-3

RFS-4

RFS-5

Fenced area near RFS-6

RFS-7

RFS-8

RFS-9

RFS-10

DZP-1

APPENDIX 7-14.....HISTORICAL FLOW DATA
RIGHT and LEFT FORK, WHITMORE CANYON

APPENDIX 7-14

HISTORICAL FLOW DATA
RIGHT and LEFT FORK, WHITMORE CANYON

Grassy Trial Reservoir - Right Fork Historical Flow Data - 3' Parshall Flume			
Date	Right Fork		Comments
	cfs	gpm	
4/19/1962	25.10	11,266	Leon Pressett (1)
5/1/1962	24.60	11,041	Leon Pressett (1)
4/21/1981	5.39	2,419	Leon Pressett (1)
11/13/1981	1.37	615	Leon Pressett (1)
4/26/1982	7.81	3,505	Leon Pressett (1)
5/6/1982	23.60	10,592	Leon Pressett (1)
5/25/1982	17.40	7,810	Leon Pressett (1)
6/17/1983	55.00	24,686	Leon Pressett (1)
7/14/1989	0.48	217	M. Page & R. Wilde (2)
9/15/1989	0.32	145	M. Page & R. Wilde (2)
3/7/1990	0.28	126	M. Page & R. Wilde (2)
4/20/1990	1.05	470	M. Page & R. Wilde (2)
5/22/1990	0.78	352	M. Page & R. Wilde (2)
6/8/1990	0.88	397	M. Page & R. Wilde (2)
6/15/1990	0.63	283	M. Page & R. Wilde (2)
8/27/1990	0.09	42	M. Page & R. Wilde (2)
9/17/1990	0.17	77	M. Page & R. Wilde (2)
11/14/1990	0.16	71	M. Page & R. Wilde (2)
4/15/1991	0.45	203	M. Page & R. Wilde (2)
5/14/1991	1.68	754	M. Page & R. Wilde (2)
9/17/2010	0.14	61	Dana Marrelli - Right Fork (3)
11/4/2010	0.37	165	Dana Marrelli - Right Fork (3)
1/18/2011	2.15	963	Warren Monroe (4)

Notes:

(1) Leon Pressett - East Carbon City Water Master

(2) M. Page & R. Wilde - Division of Water Rights

(3) Dana Marrelli - UAE (Flow taken in Right Fork but not from the Flume)

(4) Warren Monroe, PLS - Jones and DeMille Engineering, Inc.

Coal Operator's Weekly Inspection Form

Grassy Trail Reservoir

Inspector Name: [illegible] Title: [illegible]

Date: 4/21/81 Date Last Inspection: 4/20/81

Site Name:

Refuse Facility I. D. No.:

1.	Seepage* (specify location, color, and approx. volume)		
	From underdrain pipes	___ Yes	___ No
	At isolated points on embankment slopes	___ Yes	✓ No
	At natural hillside	✓ Yes	___ No
	Over widespread areas	___ Yes	___ No
	From downstream foundation area	___ Yes	___ No
	"Boils" beneath stream or ponded water	___ Yes	___ No
2.	Cracks or scarps on crest	___ Yes	___ No
3.	Cracks or scarps on slope	___ Yes	___ No
4.	Sloughing or bulging on slope	___ Yes	___ No
5.	Major erosion problems	___ Yes	___ No
6.	Surface movements in valley bottom or on hillside*	___ Yes	___ No
7.	Erosion of toe*	___ Yes	___ No
8.	Water impounded against toe*	___ Yes	___ No
9.	___ Increase ___ Decrease in water level (feet)	0.5	
10.	Embankment freeboard (feet)	[illegible]	
11.	Cracks, bulging, or erosion on upstream face*	___ Yes	___ No
12.	Visible sumps or sinkholes in slurry surface	___ Yes	___ No
13.	Clogging*		
	Spillway channels and pipes	___ Yes	___ No
	Decant system	___ Yes	___ No
14.	Cracking or crushing of pipes*		
	Spillway pipes	___ Yes	___ No
	Decant system	___ Yes	___ No
15.	Trash racks clear and in place	___ Yes	___ No

Auth. KSC Signature: Date:

Adverse conditions noted in items marked (*) should be described (extent, location, volume, etc.) in the space provided. Major adverse changes in these items could cause instability.

Inspection Category	Comments
	3.50 c.f.s. Left To 5.39 c.f.s. at Farm
	No [illegible]
	Spillway — No [illegible]
	[illegible]
	[illegible]
	[illegible]

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5/6/82 Clear & cool

900 H.M. - Met State Eng. At the dam - He didn't see any change at their plot - Overflow clear.

Observed By Stamp Lee with Eng

Sdg. 0.128 Flow 6.624

Looked At Minutes Diff Est 20 to 25% going by Chuckars Feathers

4:00 PM. - Cleaned Outlet

Rt. Fork	3 Min	1.520	73.6 cfs
St. Dr	4 Min	1.53	38.3 cfs
Est. Left Fork			7.7 cfs

5/9/82 - Clear & cool

Put in New Loss Kaiser & City Helped Me

Flow dropped because of cool temps.

Took Help to Col at Nucks

5/10/82 - Cloudy & cool - Snow expected

Stream flow down Site Notes last P.M.

Been working good Cleaned Over-flow

5/11/82 Cloudy & Showers

Over-flow Clear Res. down Freeboard 2.05 Over Wk 0.21

No Change in Condition No Cleaning Wk

5/5/12- High clouds & smog
1st div- Bay 1.46 VR 1 cfs
Rt. Fork 3'6 1.17 17.4'
Est Left " 1 15.7"
No change in conditions
over-flow clear.
5/6/12 - Cool & clear
Lock messed up
on gates put new
lock on.
Stream flows heavy
Diverging off bank
No change in
Conditions Around
Dam.
5/7/12- Cloudy & cooler
Cleaned over-flow.
No leak & dropping
off.
No change in
Conditions Around
Dam

29.1
33.1
17.9
13.7
Strike- East 120 - Dip 15° NE
Upstream Road Cut
Flows Around Main Body
Fish Ladder
Strike- Downstream Side Looking
Out - Overflow Chute -
Stone Pavement Facing
Rock Around Water Tap
Safe Storing Locker
Strike- Entrance Wall + Rip
Rap Downstream.
Center Top of Middle Pool Showing
Left Side of Chute - West
Side Overflow Chute.
Concrete Retaining To
Keep Out
Entire Control Gate -
Rt. Bank Showing - Bank
Material
Entire Left Control
Gate Still Facing Upstream
To Open Channel

11/11/87- Clear & Sunny

Inspected dam this date-

No change in Condition.

Res. dropping 0.01 A day.

Seep #1 & #2 Clear and flows about the same.

11/12/87- Clear & Sunny. A little cooler

Talked with Phil Mann About Truck- Bumper & Radio.

Phil to be out 23 of Nov. to look over Properties.

Inspected dam-

11/13/87 Pt. Cloudy & Cooler-

Res. down 3.50
3.45
3.27

64
4)18.0
16
2

0.18 drop
for 4 days
0.04 drop av. per day

No CHANGE IN EXISTING CONDITIONS AROUND DAM THIS DATE. SEEP #1 & #2 CLEAR & FLOWS THE SAME.

Res. dropping ABOUT THE RIGHT AMOUNT TO ASSURE REMAINING Volume for MANY EARLY RUN-OFF IN THE SPRING, CONTINUE PLAN OF ACTION AGAINST THE CRUSHING TROUBLE AROUND OVERFLOW.

RT. FORK SITE = OUT

INSPECTED RT. FORK TO MEADOWS- NO STOCK

RECEIVED
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Div. of Oil, Gas & Mining

Remarks & Comments - 1982

4/19/82 - Windy & cold. Reservoir down 2.30 feet. Released more water to creek. Water clear coming out of seeps.

4/20/82 - Cold & windy. Light snow falling at dam. No apparent change in landslides.

Wind blowing hard at the dam. Ice not melting on dam surface very fast. Surface is still completely covered. No change landslide conditions. Reservoir down 2.36 feet.

4/21/82 - Cold & Windy. Reservoir still dropping. No change in conditions of landslides. Ice not moving. Drove to the top of dam for the first time this year.

4/22/82 - Sunny & windy. Reservoir down 2.42 feet. Ice still intact all across the dam surface. Some superficial sliding around the tunnel outfall. Snow moving around dam.

4/23/82 - Light snow & warmer. Reservoir still dropping alittle. Ice still on surface. Boom starting to show up thru the ice. 4'Parshall at first diversion reading 0.60

4/24/82 - Clear & sunny. Reservoir down 2.50 feet. Ice still not moving off of the surface of the dam. Run-off should start any day now. No change in condtions of landslides.

4/25/82 - Pt cloudy & warmer. Reservoir down 2.30 feet and starting to gain. Ice still solid all over surface of dam. Reservoir gained 0.20 in 24 hours.

4/26/82 - Reservoir down 1.18 feet and gaining. Rt. fork 3' Parshall reading 0.76. Ice on reservoir about 4" thick at this time . Water coming from seeps.

4/27/82 - Pt. cloudy & warm. Reservoir down 1.86 feet and gaining. Ice still solid over the whole surface of dam. Seepage water flows the same and water clear.

4/28/82 - Clear & warmer. Reservoir down ~~3xx~~ 1.37 feet. 0.49 gain in 24 hours. Ice stll on surface. Reservoir started to spill over the over-flow this afternoon. Boom frozen in ice.

4/29/82 - High clouds & cool. Ice still intact. water flowing over the over-flow smoothly. First diversion reading 0.88 4'Parshall .91 c.f.s.

5/1/82 - Raining & cool. Shut by-pass water off. Cleaned over-flow. Ice still on surface of reservoir, but should move off today. Slide areas look stable.

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Remarks and Comments - 1982

5/2/82 - Continued- 11:00 P.M. starting to rain hard at dam. Ice layer still intact and being forced over boom and into grill ara around over-flow. Stayed to 3:00 A.M. - 5/3/82 cleaning over-flow by keeping ice cleaned off. I came back to dam at 5:30 A.M. and cleaned over-flow. At 8:30 A.M. Cleaned over-flow again and observed flows coming into dam. Flows increasing fast.

5/3/82 - Talked to Kaiser about making a new boom. Cleaning over-flow 6 times a day at this time.

5/4/82 - Pt. cloudy & warmer. Cleaned over-flow. Freeboard - 7.94 feet. 0.34 going over lip of over-flow. Some 47.0 c.f.s. going o over. Slide areas look good with no apparent change. Seeps running the same and the water is clear.

5/5/82 - Cold & windy - Free-board 7.90 feet from water level in dam and crest of dam.

5/6/82 - Met State Eng. at the dam. He didn't seem to think that there had been any change in the landslide areas. Observed the Big Spring diversion point with State Eng. Rdg 1.40 thru 3'Parshall Observed the Himonas diversion point. Est. 20 to 30 c.f.s. going by diversion point. Cleaning over-flow 3 times a day at this time. rt. Fork 3'Parshall - 1.54 - 23.6 c.f.s. - First diverion 4'Parshall - 1.53 31.3 c.f.s.

5/7/82 - Clear and cool - Put in new boom with Kaiser & City people. Flows dropping because of cooler weather.

5/8/82 - Cloudy & cool - Reservoir free-board 8.05 feet. 0.21 going over lip of over-flow. Cleaned over-flow. Boom working good. No change in conditions of landslides around dam.

5/11/82 - Cludy & Cool. Seeage flows the same and clear. No new slide areas. First diversion 4'Pharshall 18.1 c.f.s.

5/12/82 - Cold & windy - Boom working good. Stream flow down alot. No change in conditions around dam.

5/13/82 - Clear & warm. Over-flow clean. Flows have dropped way way off.

5/14/82 - Stream flows still dropping. Boom working good. No apparent change in landslide areas.

5/15/82 - Over-flow clean. Cloudy and chance of rain today. Light rain fell in the afternoon. No problem from any increase flows into the dam.

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Remarks & Comments - 1982

5/16/82 - High clouds & Warmer. Boom in good shape and over-flow is clear of any trash. Nice rain again. No change in conditions around dam.

5/17/82 - Clear & cool. Inflow into reservoir dropping fast. Water is clear. Freeboard 8.18 feet. Seeps look clear and the flows the same. Not much water being used in towns at this time.

5/18/82 - Cloudy & Rainimg. Drove above dam to look at water shed. No change in conditions around dam. Roads slikk. Boom in good order. Over-flow clean.

5/19/82 - Cloudy & cool. Cleaned voer-flow. Freeboard 8.00 feet Water going over lip of over-flow 0.27 feet. No apparent change in conditions around dam. 0.22 " of rain fell in area.

5/20/82 - Clear & Sunny. Freeboard 8.05 feet. 0.22 going over lip. Water flows dropping.

5/21/82 - Warmer. No change in conditions around dam. Cleaned over-flow.

5/22/82 - Routine Turned more water to towns. Leaves starting to leave out on trees.

5/23/82 - Warmer. Snow starting to move fast. Seep water clear & flows the same. Canyon is starting to green and pretty.

5/24/82 - Pt. cloudy & warmer. Light rain in the evening. No apparent change in condtions around dam.

5/25/82 - High clouds & Warmer. First diversion 4'Parshall 1.46 - 29.1 c.fs. Right fork 3' Parshall 1.27 17.4 c.fs. No change in condtions around dam.

5/26/82 - Cool & clear. Lock messed up on gate. I put a new one one one. No apparent change in conditons around dam.

5/27/82 - Cloudy & cooler. Cleaned over-flow. Flows dropping off. No change in conditions around dam.

5/28/82 - Routine - Cleaned over-flow. Roads are real rough. Percolation water around dam the same and the water water is clear.

5/29/82 - Routine - Boom working good. Cleaned over-flow. Some superficial fliding taking place in area of tunnel out-fall.

5/30/82 - Routine - Reservoir still over-flowing. Some superficial sliding taking place along bank near the road on the West side Cleaned over-flow. Canyon is really green and pretty.

5/31/82 - Routine - Cleaned over-flow. Gate still locked. Water still bein diverted to creek.

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6/15/83 Clear & Sunny
Freeboard 7.23
6/9 Cleaned over-flow
3/14 Talked with STATE
people AT dam - TAR. SANDS
info.
Cleaned TRASH Around
edges of dam.
Landslide draining
out Rdg c.f.s
1st. 9.30 am 4 PAK 7.68 750
6/16/83. Clear & Sunny
Worked on KAISER
CHlorinator
9:00 am 1st div 4 PAK. 7.42 67.1
Cleaned over-flow
" logs on edges
of dam

6/17/83 Clear & Sunny
Cita 6 PAK for tomorrow-
10:30 am 1st div 7.54 69.0 c.f.s up from yesterday
5 pm ST. Fan 3 PAK.
7.66 55.0 c.f.s
left 18.0 c.f.s
4.0 c.f.s going to
Towns.
Cleaned over-flow
Cleaned TRASH
Around edges of dam
Logs Left.
Left Fork H2O Muddy
Right " " Clear
Warm today - Hi Snow
MUST be coming

Grassy Trail Dam - Div. Water Rights

Stream Flow Measurements

M. Pugs / R. Wilds

1 Date Measured	2 Left Fork GPM	3 Left Fork Gal/Day	4 Right Fork GPM	5 Right Fork Gal./Day	6	7 Total - Both Forks GPM	8 Total - Both Forks Gal./Day
7-14-89	154	221760	217	312480		371	534240
9-15-89	88	126720	145	208800		233	335520
3-7-90 (est.)	108	155520	126	181440		234	336960
4-20-90	371	534000	470	678000		841	1212000
5-22-90	230	332367	352	508010		582	840377
6-8-90	123	175959	397	573496		520	749455
6-15-90	159	228799	283	407830		442	636629
8-27-90	47	67680	42	60480		89	128160
9-17-90	43	61920	77	110880		120	172800
11-14-90	56	80640	71	102240		127	182880
4-15-91	94.5	136080	202.5	291600		297	427680
5-14-91	.748 CFS 336	483840	1.68 CFS 754	1085760	2.428 CFS	1090	1569600

INCORPORATED
MAR 23 2011
Div. of Oil, Gas & Mining

Shaver, Dave

From: Warren Monroe [Warren@jonesanddemille.com]
Sent: Thursday, March 03, 2011 12:24 PM
To: Shaver, Dave
Cc: Rusty Netz; Brian Barton; Jeremy Humes; Polly
Subject: Grassy Trail flow data

The historic data I have is from an untitled, unsigned document, 10 pages long, scanned into the Ut. State Division of Water Rights database.
The only heading on the document is "General Remarks". It infers it may have been a supplemental document to a proof, but I cannot be sure of that.

The following is a portion of pages 3,4: "On April 19, 1962, readings were taken at the measuring devices mentioned above, (3' parshall flumes) by Leon Pressett, water master, and the following data were collected: at 2:30 P.M. a reading of 0.86' was taken on the 3' Parshall Flume located in the Left Fork of Grassy Trail Creek above the reservoir indicating a flow of 9.48 cfs in the left fork. At 2:45 P.M. a reading of 1.60 ' was taken on the 3' Parshall Flume located in the Right Fork of Grassy Trail Creek above the reservoir indicating a flow of 25.10 cfs in the right fork, showing a total flow into the reservoir of 34.58 cfs. (I have verified these 2 flow rates for the depth of head from one of my water measurements manuals). At 2:10 P.M. of the same date, the water level indicator in the reservoir showed the water level in the reservoir to be El. 7607.48, indicating a storage of approximately 758 acre feet at that time. The water continued to rise in the reservoir until about a week later the reservoir overflowed with a storage of about 916 acre feet. There was no water being bypassed from the reservoir into Grassy Trail Creek at the time the flow of 34.58 cfs. was measured from the Left and Right Forks".

The following is a portion of pages 8,9: "On May 1, 1962, Win Templeton, Boyd McKean, Leon Pressett, and Ted Newell took several measurements of water being used".....(measurements are from downstream diversions 4-9, unrelated to the reservoir inflow or storage) "On the same day, water was measured flowing into the reservoir as follows; The 3 foot Parshall Flume in the right fork showed a reading of 1.58 ft. indicating a flow of 24.6 cfs. The 3 foot Parshall Flume in the left fork showed a reading of 1.52 ft. indicating a flow of 23.1 cfs or a total flow into the reservoir of 47.7 cfs."

The results of water measurements of Grassy Trail Creek conducted on Jan. 18, 2011 by myself, assisted by East Carbon personal, approximately midday are as follows: Left Fork .276 cfs. or 124 gpm. Right Fork 2.145 cfs. or 963 gpm. Total inflow 2.421 cfs. or 1087 gpm. It was noted that at this time only 416 gpm of culinary water was going through the water treatment plant to the cities and Co-Gen.
There was no evidence of the water level in the reservoir raising on this day, as it should have, based on the inflow and outflow. It is our conclusion that the reservoir is leaking drastically.

I hope this is what you're looking for. I have asked the cities about any other data, and no one has any knowledge of any other record.
If we can be of more assistance, give a shout. Thanks.

Warren Monroe, PLS
Jones and DeMille Eng. Inc.
Richfield, Utah 84701
435)896-8266
warren@jonesanddemille.com

INCORPORATED
MAR 2 3 2011
Div. of Oil, Gas & Mining

JONES & DEMILLE ENGINEERING
1535 South 100 West
Richfield, Utah 84701
Telephone (435) 896-8266
Fax (435) 896-8268

Project:	Range Creek Feasibility	Page	1
Location:	Grassy trail Water	Date:	1-18-11
Product:	Measurements	By:	WM
Client:	E. Carbon / Sunnyside	Checked:	

Made site visit to Grassy trail reservoir this A.M. Aprox. 1.5' snow depth. No visible signs of ice heave to reflect water level rising.

Lt. Fork @ Grassy trail creek above reservoir.

4' Ø CMP ± outlet above res. partially silted in. Parshall flume above reservoir washed out, sitting up on bank.

width of flow 2.3' ±, depth of flow .10' + .20' + .25' = .55'

.55' ÷ 3 = .18 Ave. depth, Ave. width 2.3', Area 0.414 s.f.

Timed travel for a stick to go 2 l.f. inside c.m.p. 3 sec.

$\frac{3}{2}$ = 1.5 sec. / l.f. Area .414 s.f. ÷ 1.5 = .276 cfs = 124 gpm

---

Rt. fork @ Grassy trail creek above reservoir.

3' steel parshall, rocks and gravel partially filled channel and flume. No staff gauge in Flume. Determined measuring Point by 2/3 convergence length.

depth .40', but only 75% of the open channel flowing because of washed in gravel.

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3' Parshall flume, $Q = 4.00 W h_a^{1.522(W^{.026})}$

.4' depth = 2.86 cfs × 75% = 2.145 cfs = 963 gpm

Air temp at Treatment plant @ 1 P.M. 40° F.

No melting on mountain.

-Flow: Total flow into Res. this A.M. 963 + 124 = 1087 gpm.

+Flow: Meters at Treatment Plant this P.M. #1 202 gpm, #2 214 gpm, total 416 gpm

Grassy Trial Reservoir - Left Fork Historical Flow Data - 3' Parshall Flume			
Date	Left Fork		Comments
	cfs	gpm	
4/19/1962	9.48	4,255	Leon Pressett (1)
5/1/1962	23.10	10,368	Leon Pressett (1)
4/20/1981	3.50	1,571	Leon Pressett (1)
5/6/1982	7.70	3,456	Leon Pressett (1)
5/25/1982	15.70	7,047	Leon Pressett (1)
6/10/1983	14.70	6,598	Leon Pressett (1)
6/17/1983	18.00	8,079	Leon Pressett (1)
7/14/1989	0.34	154	M. Page & R. Wilde (2)
9/15/1989	0.20	88	M. Page & R. Wilde (2)
3/7/1990	0.24	108	M. Page & R. Wilde (2)
4/20/1990	0.83	371	M. Page & R. Wilde (2)
5/22/1990	0.51	230	M. Page & R. Wilde (2)
6/8/1990	0.27	123	M. Page & R. Wilde (2)
6/15/1990	0.35	159	M. Page & R. Wilde (2)
8/27/1990	0.10	47	M. Page & R. Wilde (2)
9/17/1990	0.10	43	M. Page & R. Wilde (2)
11/14/1990	0.12	56	M. Page & R. Wilde (2)
4/15/1991	0.21	95	M. Page & R. Wilde (2)
5/14/1991	0.75	336	M. Page & R. Wilde (2)
1/18/2011	0.28	124	Warren Monroe (3)

Notes:

(1) Leon Pressett - East Carbon City Water Master

(2) M. Page & R. Wilde - Division of Water Rights

(3) Warren Monroe, PLS - Jones and DeMille Engineering, Inc.

Shaver, Dave

From: Warren Monroe [Warren@jonesanddemille.com]
Sent: Thursday, March 03, 2011 12:24 PM
To: Shaver, Dave
Cc: Rusty Netz; Brian Barton; Jeremy Humes; Polly
Subject: Grassy Trail flow data

The historic data I have is from an untitled, unsigned document, 10 pages long, scanned into the Ut. State Division of Water Rights database.
The only heading on the document is "General Remarks". It infers it may have been a supplemental document to a proof, but I cannot be sure of that.

The following is a portion of pages 3,4: "On April 19, 1962, readings were taken at the measuring devices mentioned above, (3' parshall flumes) by Leon Pressett, water master, and the following data were collected: at 2:30 P.M. a reading of 0.86' was taken on the 3' Parshall Flume located in the Left Fork of Grassy Trail Creek above the reservoir indicating a flow of 9.48 cfs in the left fork. At 2:45 P.M. a reading of 1.60 ' was taken on the 3' Parshall Flume located in the Right Fork of Grassy Trail Creek above the reservoir indicating a flow of 25.10 cfs in the right fork, showing a total flow into the reservoir of 34.58 cfs. (I have verified these 2 flow rates for the depth of head from one of my water measurements manuals). At 2:10 P.M. of the same date, the water level indicator in the reservoir showed the water level in the reservoir to be El. 7607.48, indicating a storage of approximately 758 acre feet at that time. The water continued to rise in the reservoir until about a week later the reservoir overflowed with a storage of about 916 acre feet. There was no water being bypassed from the reservoir into Grassy Trail Creek at the time the flow of 34.58 cfs. was measured from the Left and Right Forks".

The following is a portion of pages 8,9: "On May 1, 1962, Win Templeton, Boyd McKean, Leon Pressett, and Ted Newell took several measurements of water being used".....(measurements are from downstream diversions 4-9, unrelated to the reservoir inflow or storage) "On the same day, water was measured flowing into the reservoir as follows; The 3 foot Parshall Flume in the right fork showed a reading of 1.58 ft. indicating a flow of 24.6 cfs. The 3 foot Parshall Flume in the left fork showed a reading of 1.52 ft. indicating a flow of 23.1 cfs or a total flow into the reservoir of 47.7 cfs."

The results of water measurements of Grassy Trail Creek conducted on Jan. 18, 2011 by myself, assisted by East Carbon personal, approximately midday are as follows: Left Fork .276 cfs. or 124 gpm. Right Fork 2.145 cfs. or 963 gpm. Total inflow 2.421 cfs. or 1087 gpm. It was noted that at this time only 416 gpm of culinary water was going through the water treatment plant to the cities and Co-Gen.
There was no evidence of the water level in the reservoir raising on this day, as it should have, based on the inflow and outflow. It is our conclusion that the reservoir is leaking drastically.

I hope this is what you're looking for. I have asked the cities about any other data, and no one has any knowledge of any other record.
If we can be of more assistance, give a shout. Thanks.

Warren Monroe, PLS
Jones and DeMille Eng. Inc.
Richfield, Utah 84701
(435)896-8266
Warren@jonesanddemille.com

INCORPORATED
MAR 2 3 2011
Div. of Oil, Gas & Mining

Coal Operator's Weekly Inspection Form

Grassy Trail Reservoir

Inspector Name: Roy Prescott Title: Water master

Date: 4/21/81 Date Last Inspection: 4/20/81

Site Name:

Refuse Facility I. D. No.

1.	Seepage* (specify location, color, and approx. volume)		
	From underdrain pipes	___ Yes	___ No
	At isolated points on embankment slopes	___ Yes	✓ No
	At natural hillside	✓ Yes	___ No
	Over widespread areas	___ Yes	✓ No
	From downstream foundation area	___ Yes	✓ No
	"Boils" beneath stream or ponded water	___ Yes	✓ No
2.	Cracks or scarps on crest	___ Yes	✓ No
3.	Cracks or scarps on slope	___ Yes	✓ No
4.	Sloughing or bulging on slope	___ Yes	✓ No
5.	Major erosion problems	___ Yes	✓ No
6.	Surface movements in valley bottom or on hillside*	___ Yes	✓ No
7.	Erosion of toe*	___ Yes	✓ No
8.	Water impounded against toe*	___ Yes	✓ No
9.	___ Increase ___ Decrease in water level (feet)	0.20	
10.	Embankment freeboard (feet)	8.55	
11.	Cracks, bulging, or erosion on upstream face*	___ Yes	✓ No
12.	Visible sumps or sinkholes in slurry surface	___ Yes	✓ No
13.	Clogging*		
	Spillway channels and pipes	___ Yes	✓ No
	Decant system	___ Yes	✓ No
14.	Cracking or crushing of pipes*		
	Spillway pipes	___ Yes	✓ No
	Decant system	___ Yes	✓ No
15.	Trash racks clear and in place	✓ Yes	___ No

Auth. KSC Signature: Date:

Adverse conditions noted in items marked (*) should be described (extent, location, volume, etc.) in the space provided. Major adverse changes in these items could cause instability.

Inspection Category	Comments
	Outlet - 5.83 c.f.s. Walked around to Cool - 73 of the 1de Still on Surface - 1" to 2" thick 3.50 c.f.s. Left To 5.39 c.f.s. N. Fork
	No problem with good flow
	Surface - H2O down below lip
	Berm submerged for about 30 ft
/	No Change in Hillside slides
	H2O Clear About the same

5/6/82 Clear & cool

9:00 A.M. - Met Start Eng. at the dam - He didn't see any change at Parker Place Over-flow Clear.

Observed Big Spring Later with Eng

Rdg. 0.40 1 Pan. 6.67

Looked at Airmovac Later Est 20 to 25% going by Duration Facilities

4:00 PM. - Checked Overflow

Rt. Fork	3 Pan	1.52	23.6%
Lt. Div	4 Pan	1.53	33.3%
Est. Left Fork			7.7%

5/7/82 - Clear & cool

Put in New Basin

Kaiser & City

Helped Me

flow dropped because of cool temps.

Tour Help to Cut at Ducks

Start - 8:00 AM - Cloudy & Cool - Snow expected

Stream flow down

Site Reads Low

E.K.

Sown Working good

Cleaned Over-flow

Site - Cloudy & cool

Had shower -

Sown working good

Cleaned Over-flow

5/8/82 - Cloudy & Snowing

Over-flow Clear

Yes. Low Pressure 8.05

Over Night - 0.21

No Change in Conditions

Re Cleaning Up

5/25/82 High clouds & sunny

1st Air - Dry 1.46 V91 cfs

Rt. Fan 3" Dp 1.77 17.9"

ES Left A 15.7"

No change in Condition
over-flow clean

5/26/82 - Cool & Clear
Lock Missed up
on gate. Put new
lock on.
Stream flows really
Dropping off here
No Change in
Conditions Around
Dam

5/27/82 - Cloudy & cooler
Cleaned over-flow.
Did Weir & dropping
off.
No Change in
Conditions Around
Dam

29.1
4
33.1
17.4
15.7

6/10/83 Clear & Sunny
Nice K 6/9/83
Walked Around dam
& Checked Rt. Fork
3' Bar.

Rdg.	3/8 Ar.	3.50	54.20	c.f.s.
	14 Rec.	0.21		
1st div.	4 Bar.	3.0	67.9	c.f.s
"	14 Rec	1.30	64.9	"
Left. Fork. Est		14.7	"	

H2O Clearing up

6/11/83. 7:00AM. Pt. Cloudy
Cleaned over. flow.
Landslides about the
same.
3:00PM. - Cloudy & Cool
R.
over-flow Clear

6/12/83. Cloudy & windy
Lite R.
Checked dam three
Times - No Change
Prepared up looking
Road over for possible
Access to His Property
6/13/83 - Pt. Cloudy & Cool

		+4 Rec	+12	
Mark.	1.15	19 Rec	99.12	89 c.f.s

Picked TRASH Around
edges of dam.
Landslides drying
OUT
6/14/83 Pt. Cloudy - Warming up
Cleaned over. flow
3 Times Today
Worked on TRASH
Around dam
Talked TO Auctsmen
About opening Road - Next Mon

6/1 div. Bar 50
90 c.f.s

6/15/83 Clear & Sunny

Freeboard 7.72

6/6 Cleaned over-flow

2/14 Talked with State

People at dam - Tar-Sands

Info.

Cleaned TRASH Around

edges of dam.

Landslide dying

out. Rdg cfs

1st 9:30am 4'Par. 7.67 75.0

6/16/83. Clear & Sunny

Worked on Kaiser

Chlorinator

9:00am 1st div 4'par. 7.42 67.1

Cleaned over-flow

of logs on edges

of dam

6/17/83. Clear & sunny

Cha. of R fm overflow - up from Yesterday

1st div 7.54 69.0 cfs

Rt. Fork

3 fan. 7.66 55.0 c.f.s

Left. 18.0 c.f.s

4.0 cfs going to

Towns.

Cleaned over-flow

Cleaned TRASH

Around edges of dam

Lots Left.

Left Fork H2O Muddy

Right " " Clear

Warm today - Lt Snow

Must be coming

Grassy Trail Dam - Div. Water Rights
Stream Flow Measurements
M. Pagz / R. Wilds

Date Measured	Left Fork GPM	Left Fork Gal/Day	Right Fork GPM	Right Fork Gal./Day
7-14-89	154	221760	217	312480
9-15-89	88	126720	145	208800
3-7-90 (est.)	108	155520	126	181440
4-20-90	371	534000	470	678000
5-22-90	230	332367	352	508010
6-8-90	123	175959	397	573496
6-15-90	159	228799	283	407830
8-27-90	47	67680	42	60480
9-17-90	43	61920	77	110880
11-14-90	56	80640	71	102240
4-15-91	94.5	136080	202.5	291600
5-14-91 .748CFS	336	483840	1.68CFS 754	1085760

JONES & DEMILLE ENGINEERING
1535 South 100 West
Richfield, Utah 84701
Telephone (435) 896-8266
Fax (435) 896-8268

Project:	Range Creek Frasibility	Page	1
Location:	Grassy trail Water	Date:	1-18-11
Product	Measurements	By:	WM
Client:	E. Carlson / Sunnyside	Checked:	

Made site visit to Grassy trail reservoir this A.M. Aprox. 1.5' snow depth. No visible signs of ice heave to reflect water level rising.

Lt. Fork @ Grassy trail creek above reservoir.

4' Ø cmp ± outlet above res. partially silted in. Parshall flume above reservoir washed out, sitting up on bank.

width of flow 2.3' ±, depth of flow .10' + .20' + .25' = .55'

.55' ÷ 3 = .18 Ave. depth, Ave. width 2.3', Area 0.414 s.f.

Timed travel for a stick to go 2 l.f. inside c.m.p. 3 sec.

$\frac{3}{2}$ = 1.5 sec. / l.f. Area .414 s.f. ÷ 1.5 = .276 cfs = 124 gpm

---

Rt fork @ Grassy trail creek above reservoir.

3' steel parshall, rocks and gravel partially filled channel and flume. No staff gauge in Flume. Determined measuring point by 2/3 convergence length.

depth .40', but only 75% of the open channel flowing because of washed in gravel.

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3' Parshall flume, $Q = 4.00 W h_a^{1.522(W^{.026})}$

.4' depth = 2.86 cfs x 75% = 2.145 cfs = 963 gpm

Air temp at Treatment plant @ 1 P.M 40° F.

No melting on mountain.

low: Total flow into Res. this A.M. 963 + 124 = 1087 gpm.

ow: Meters at Treatment Plant this P.M. #1 202 gpm, #2 214 gpm, total 416 gpm

APPENDIX 7-15.....GAIN-LOSS ANALYSIS RIGHT FORK, WHITMORE CANYON

APPENDIX 7-15

GAIN-LOSS ANALYSIS
RIGHT FORK, WHITMORE CANYON

Investigation of Stream Discharge Rates in the Right Fork of Whitmore Canyon

13 December 2011

West Ridge Resources, Inc.
West Ridge Mine
East Carbon, Utah

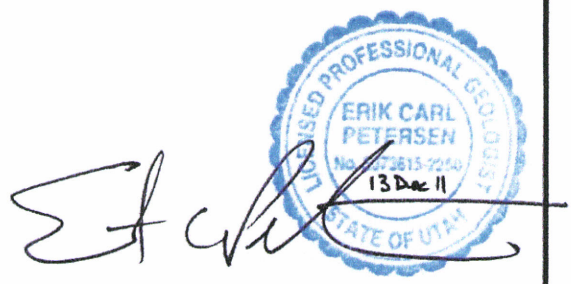
PETERSEN HYDROLOGIC, LLC
CONSULTANTS IN HYDROGEOLOGY

Investigation of Stream Discharge Rates in the Right Fork of Whitmore Canyon

13 December 2011

West Ridge Resources, Inc.
West Ridge Mine
East Carbon, Utah

Prepared by:



Erik C. Petersen, P.G.
Senior Hydrogeologist
Utah P.G. No. 5373615-2250

PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

2695 N. 600 E.
LEHI, UTAH 84043
(801) 766-4006
PETERSEN@RELIA.NET

1.0 Introduction

West Ridge Resources, Inc. is currently conducting coal mining operations in the Right Fork of Whitmore Canyon drainage. In 2011, West Ridge Resources, Inc. commissioned Petersen Hydrologic, LLC to perform a surface-water gain/loss study in the stream in the Right Fork of Whitmore Canyon (also sometimes referred to as the Right Fork of Grassy Trail Creek). The purpose of the gain/loss study is:

1. to provide a baseline characterization of spatial variability in baseflow stream discharge rates in the stream reaches in proposed mining areas (i.e. to characterize pre-mining gaining and losing reaches of the stream), and

2. to provide insight into interactions between groundwater and surface-water systems in the drainage.

This report summarizes the findings of the gain/loss study.

Including this introduction, this report contains the following sections:

1. Introduction
2. Methods of Study
3. Geology
4. Presentation of Data
5. Discussion
6. Conclusions
7. References Cited

2.0 Methods of Study

- The Right Fork drainage was visited on 24 October 2011 by Petersen Hydrologic personnel. It should be noted that in the several weeks prior to the performance of the 24 October 2011 study, a series of significant precipitation events had occurred in the drainage. In the few days prior to the field investigation, no significant precipitation had occurred.

- During the 24 October 2011 visit, observations of geologic conditions in the stream channel and in the adjacent valley bottom and hillsides were made.

- Eleven stream discharge monitoring sites were selected in the vicinity of the West Ridge Mine longwall panels 20, 21, and 22. Stream discharge monitoring site locations were selected in locations above, within, and below proposed mining areas.

- The locations of the stream discharge monitoring stations were determined in the field using a hand-held Garmin GPSmap60CSx GPS unit.

- Stream monitoring stations were photographed and marked in the field.

- Current-velocity discharge measurements were performed at 9 of the 11 monitoring sites using a Marsh-McBirney brand electromagnetic current velocity meter and a wading rod. Discharge measurements were performed using standard methods described by the United States Bureau of Reclamation in its Water Measurement Manual.

- Discharge rates at 2 monitoring sites were performed at the permanently installed 3-foot Parshall flumes present in the Right Fork (RF-1 and RF-2). Discharge rates were calculated from the flume stage height using standard methods described by the United States Bureau of Reclamation in its Water Measurement Manual.

3.0 Geology

In the surveyed portion of the Right Fork of Whitmore Canyon, alluvial sediments and the North Horn and Colton bedrock formations are present. The structure, depositional history, and lithology of the bedrock formations in the area are described by Mayo and Associates (1998).

The North Horn Formation is a late Cretaceous and early Tertiary deposit which consists of reddish-brown and grayish-brown mudstone with interbedded siltstone, sandstone, and limestone. The sandstone fraction occurs mostly as sandstone paleochannel deposits, which are isolated spatially by overbank mudstones and lacustrine clays. In the Right Fork of Whitmore Canyon area, the North Horn Formation is exposed only in the lower canyon walls near the mouth of the Right Fork drainage. It is present immediately beneath the alluvial sediments in the lower portion of the survey area.

The Colton Formation is a Tertiary deposit that consists of dark, reddish brown mudstone and shaley siltstone. The Colton Formation is the bedrock formation that comprises most of the canyon walls and mountainous regions adjacent to the Right Fork of Whitmore Canyon drainage surveyed in this investigation. It is present immediately beneath the alluvial sediments in the middle and upper portions of the survey area.

The bedrock formations in the West Ridge Mine area dip to the northeast (away from the escarpment) at approximately 3 to 8 degrees.

Underlying the stream channel in the surveyed portion of the Right Fork of Whitmore Canyon Creek are unconsolidated alluvial deposits that consist predominantly of cobbles, gravels, and fine-grained sands and silts.

4.0 Presentation of Data

Stream discharge monitoring station locations and the locations of the proposed mining areas (panels 20, 21, and 22) are shown on Figure 1. The results of the discharge measurements are presented in Table 1. Also listed on Table 1 are the locations of the stream monitoring sites in UTM, Zone 12, NAD 27 coordinates. Also listed on Table 1 are the approximate linear up-canyon distances in feet relative to the mouth of the Right Fork drainage. The discharge measurements are plotted as a function of linear distance above the mouth of the Right Fork drainage on Figure 2.

5.0 Discussion

During the field investigation, it was observed that alluvial sediments comprising the stream channel substrate in the Right Fork consist of cobbles, gravels, and fine-grained sands and silts in varying proportions. The width of the valley bottom is also variable within the surveyed reach of the Right Fork. Both the uppermost and lowermost portions of the surveyed stream channel are relatively narrow bottomed, while the valley bottom widens considerably in the middle reaches. Also present in the middle reaches of the Right Fork is a series of beaver dams (see Photographs Section).

Locally, bedrock units of either the North Horn Formation or the lower Colton Formation act as a relatively impermeable basement beneath the overlying alluvial groundwater systems in the canyon. The presence of the low-permeability bedrock strata of these formations forms a basement that minimizes the potential for downward migration of alluvial groundwaters into deeper bedrock strata. The fact that there is apparently no net loss of groundwater in the surveyed reach of the North Fork supports this conclusion.

When the stream was surveyed in October 2011, there was a net increase of 39 gpm from the maximum measured upstream flow (673 gpm) to the maximum downstream flow (712 gpm), which represents a gain of approximately 5.8%. The maximum up-stream discharge measurement was determined using the newly installed 3-foot Parshall flume at station RF-2. The maximum downstream discharge measurement was performed at monitoring site number 11 using a current-velocity meter and a wading rod. Monitoring site 11 is located a short distance below the lower flume (RF-1). It should be noted that under ideal conditions, the accuracy range of stream flow measurements performed using a current velocity meter and wading rod is typically on the order of 5 to10 percent. The typical range of measurement error for a well-constructed and well-maintained Parshall flume is approximately 3 to 5% plus head detection error (see USBR water measurement manual, 2001). Thus the 5.8% measured difference between the maximum upstream and maximum downstream flow readings is within or perhaps slightly greater than the anticipated margin of error anticipated for the flow measurement techniques utilized.

It is apparent that the flux of water moving down the Right Fork drainage includes both surface flows within the stream channel and also waters migrating through subsurface zones of permeable alluvial sediments beneath the stream channel. In some zones, more water moves through the alluvium, in other zones it is less. Most notably, in the middle reaches of the surveyed stream, where the valley bottom is wide and a series of beaver dams impounds water over broad portions of the valley floor, the stream looses water which flows into the underlying alluvial groundwater system. In the lower reaches of the surveyed stream the channel, the valley bottom becomes narrower and stream discharge rates increase, likely as water flows from the alluvium into the stream channel. It is important to note that discharge rates in the Right Fork at the most downstream monitoring point are similar to or slightly greater than those measured at the maximum upstream monitoring point (RF-2). What this indicates is that, while some Right Fork stream water recharges the alluvial groundwater system in the middle reaches of the surveyed stream, this same water likely reemerges at downstream locations in the drainage (i.e. there is no apparent net loss of water from the drainage). In other words, it is likely that the sum of the surface flow and the subsurface alluvial groundwater flow at any given location is reasonably constant.

Where alluvial groundwater migrates down the drainage through the alluvial sediments beneath the stream, if the cross-sectional area of the alluvium decreases, or if the hydraulic conductivity of the alluvial sediments decreases, alluvial groundwater tends to be forced to the surface. It may be the case that alluvial groundwaters flowing beneath the lowermost portions of the surveyed stream reach are forced to the surface as the Right Fork alluvial

groundwater system beneath the stream intersects the alluvial groundwater system associated with the Grassy Trail Reservoir.

It should be mentioned that the discharge measured at the lower Parshall flume (Site 10, RF-1) was appreciably less than that measured short distances both above and below the flume (see Figure 2 and Table 1). We suspect that the relatively lower discharge rates measured at RF-1 may be attributable to the recent excavation work that has taken place in the stream channel immediately above and below the flume (see Photographs Section). The excavation of the stream channel alluvial sediments downstream of the flume was performed to lower the head in the stream below the flume to minimize the occurrence of submerged conditions at the flume. The saturated alluvial sediments beneath the channel in this area consist mostly of cobbles and coarse gravels which appear to be highly permeable (see Photographs Section). The lowering of the downstream head results in an increase in the hydraulic gradient in the saturated alluvial sediments beneath the flume. As a result of the increased hydraulic gradient, a corresponding increase in the rate of groundwater flow through the alluvium beneath the stream would be anticipated. In other words, the steepened hydraulic gradient resulting from the excavation likely results in more alluvial groundwater flow beneath the flume, which results in a decrease in flow of surface water through the flume (i.e. some of the water is likely bypassing the flume and flowing through the coarse alluvial sediments beneath the flume). This water apparently reenters the stream channel a very short distance lower in the canyon (at monitoring station 11).

While the lower flume has been in existence in its current location for many years and was rehabilitated during 2011, the flume at RF-2 (upstream flume) was newly installed during 2011. The location for RF-2 was selected in a relatively narrow-bottomed, straight reach of the drainage. The alluvial sediments at the RF-2 location appear both less extensive and less permeable than those observed at the lower flume site (see Photographs Section).

6.0 Conclusions

- There is no major increase or decrease in stream discharge rates in that portion of the Right Fork drainage surveyed in this investigation (i.e. the maximum upstream flow is similar to the maximum downstream flow). As indicated in Table 1 and shown on Figure 2, the maximum measured discharge above proposed mining areas (673 gpm at site 10) is within 5.8 percent of the maximum measured discharge below proposed mining areas (712 gpm at Site 1). Stream discharge rates in the middle portion of the surveyed stream channel are somewhat lower than those measured at locations both higher and lower in the drainage.

- It is likely that the decrease in stream discharge rates measured in the middle portion of the surveyed stream channel results from groundwater-surface-water interactions (i.e. the infiltration of surface flows into zones of permeable alluvium beneath the stream channel). This effect is likely most significant in the middle portions of the surveyed Right Fork where the canyon bottom widens and a series of beaver dams impounds surface waters on the underlying alluvial sediments.

- The measured 5.8 percent increase in the discharge rate at the maximum lower monitoring site relative to the maximum upstream site may be explained by 1) the forcing of alluvial groundwater to the surface near the mouth of the canyon as the valley bottom constricts and as the Grassy Trail Reservoir alluvial groundwater system is intersected, 2) typical discharge measurement error, 3) minor contributions of groundwater to the stream flow in the surveyed reach of the stream, or 4) a combination of these factors.

7.0 References Cited

Mayo and Associates, 1998, Investigation of surface-water and groundwater systems in the West Ridge area, Carbon County, Utah, unpublished consulting report prepared for Andalex Resources, Inc, Price, Utah.

United States Bureau of Reclamation, 2001, Water Measurement Manual, Revised reprint, available online at:

http://www.usbr.gov/pmts/hydraulics_lab/pubs/wmm/chap08_10.html

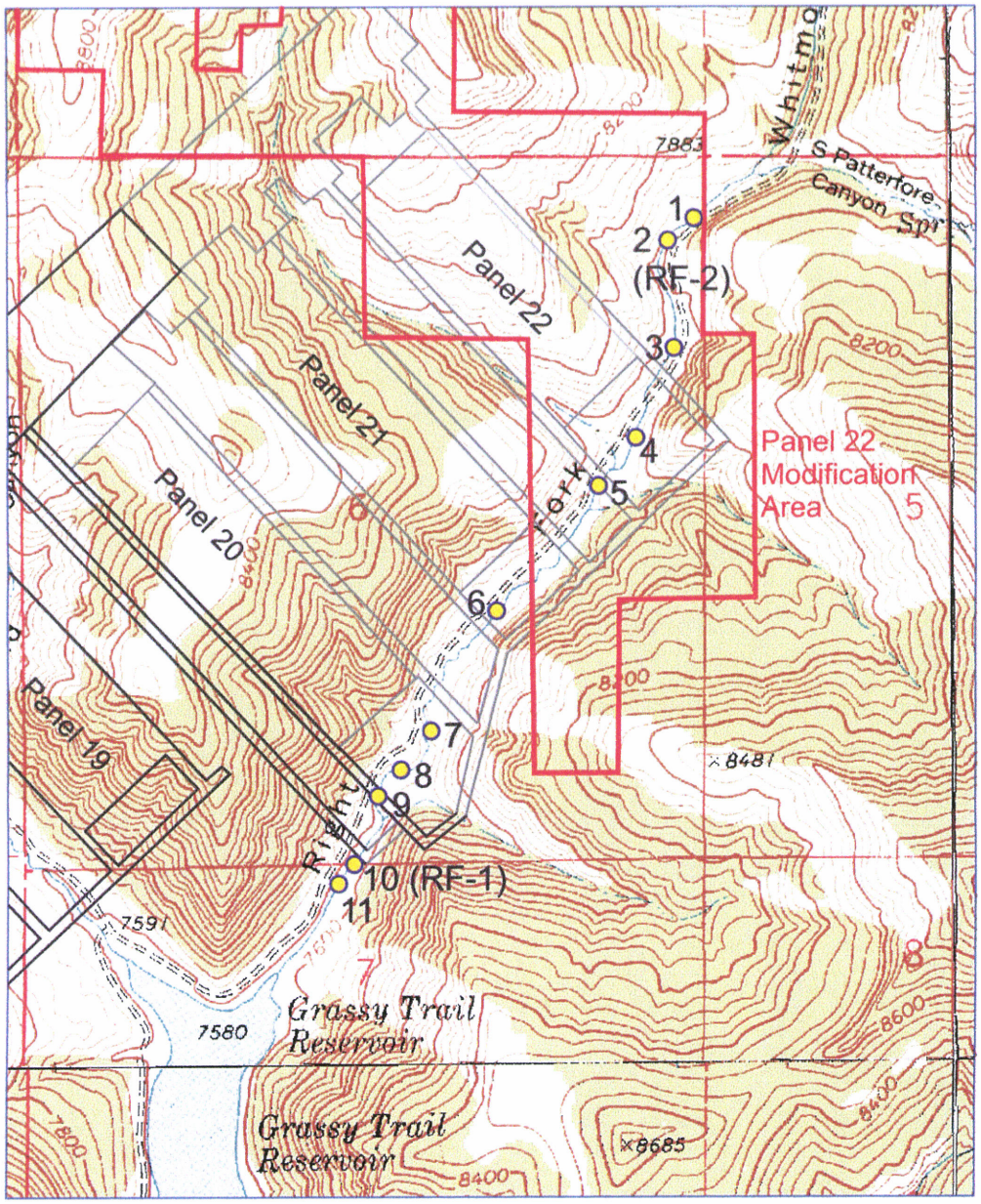


Figure 2 Locations of stream discharge monitoring stations.

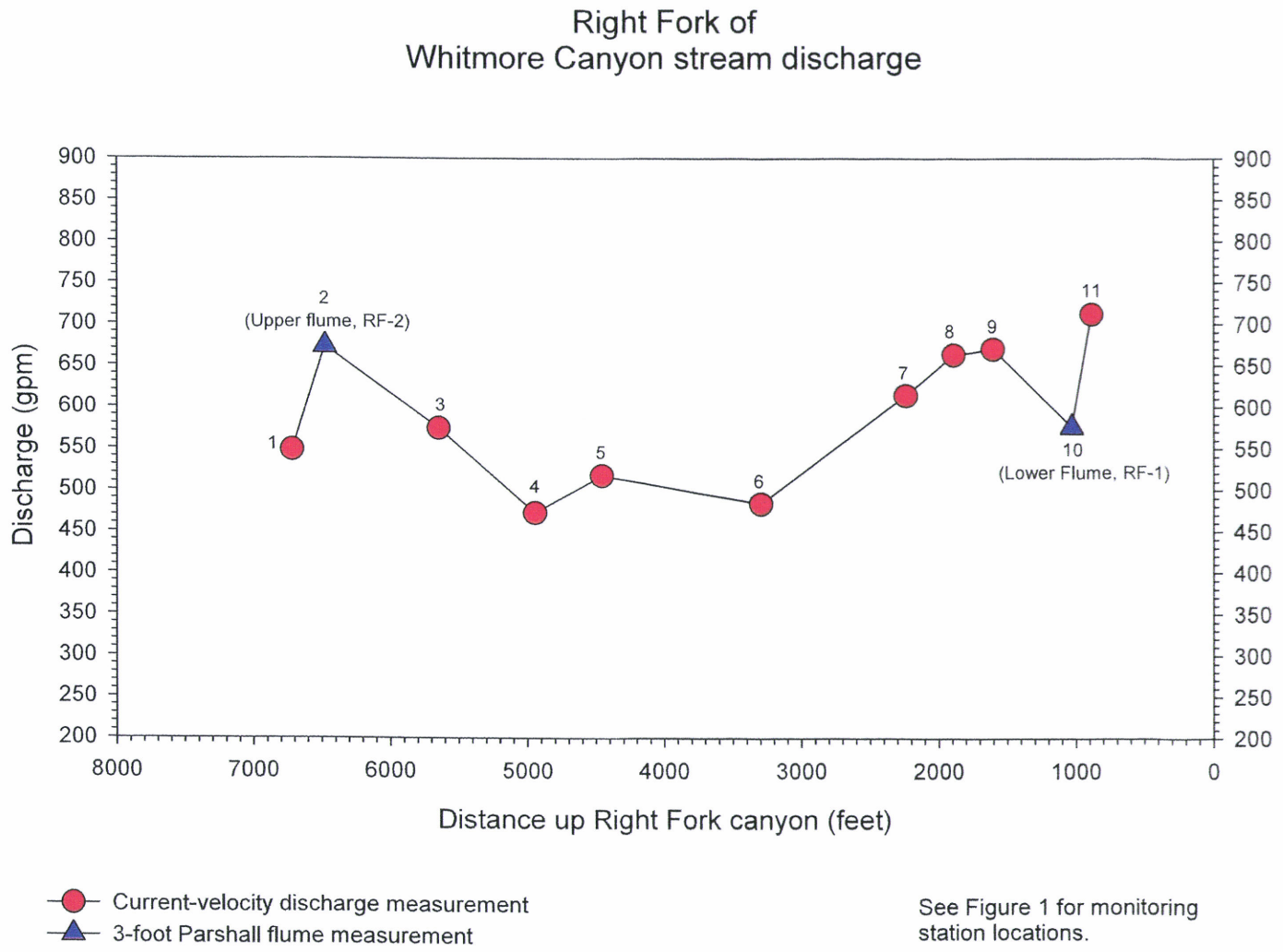


Figure 2 Stream discharge rates in the Right Fork of Whitmore Canyon, 24 October 2011.

Table 1 Results of stream discharge measurements in the Right Fork of Whitmore Canyon.

Monitoring site	Location (UTM, NAD 27)		Up-canyon distance (feet)	Discharge (gpm)
1	553033	4388042	6719	549
2 (RF-2)	552993	4387992	6478	673
3	552982	4387751	5649	575
4	552889	4387551	4946	473
5	552799	4387435	4459	518
6	552575	4387159	3296	484
7	552438	4386876	2241	614
8	552347	4386799	1893	663
9	552305	4386721	1605	670
10 (RF-1)	552234	4386557	1032	576
11	552210	4386522	887	712

Photographs Section

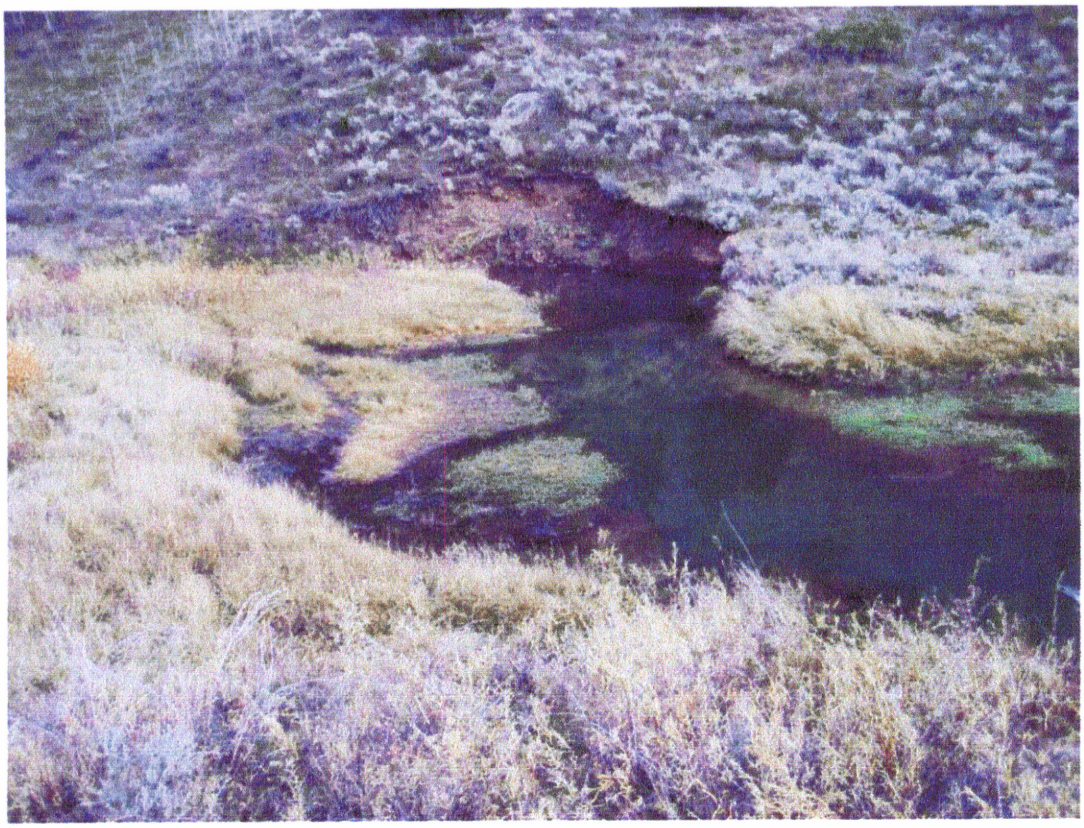
Stream channel in the vicinity of the upper flume RF-2 taken prior to the flume installation. Note narrow canyon bottom. (16 May 2011)

Upper flume RF-2. Note narrow valley bottom. (24 October 2011)

Beaver ponds near monitoring site 5 during high-flow conditions. Note widening of valley bottom. (16 May 2011)

Wide valley bottom in the middle portion of surveyed area during high flow conditions. Note the bifurcation of the stream channel on the wide, low-gradient valley floor. (16 May 2011)

Beaver pond in middle portion of the drainage. (24 October 2011)



Beaver pond in middle portion of the drainage. (24 October 2011)

Excavated stream channel near RF-1. Note the coarse, cobbley alluvium in the channel bed and banks. Also note the excavated stream sediments on the stream banks. (14 July 2011)

Location of lower flume RF-1. Note the cobbley alluvium and excavated stream sediments on the stream banks. (24 October 2011)

Monitoring site number 11. Note the excavated stream channel and the coarse-grained alluvium. (24 October 2011)

Typical measured stream channel segment in the Right Fork (monitoring site number 8). (24 October 2011)

Typical measured stream channel segment in the Right Fork (monitoring site number 3). (24 October 2011)

View from Grassy Trail Reservoir looking up the Right Fork of Whitmore canyon. Note the arm of the reservoir extending into the mouth of the Right Fork. (20 August 2010)

APPENDIX 7-16.....UNDERGROUND FLOW METERS

APPENDIX 7-16

UNDERGROUND FLOW METERS
VICINITY OF RIGHT FORK, WHITMORE CANYON

APPENDIX 7-16
Underground Flow Meters, Right Fork Longwall Panels

In order to determine the possible affects of mining within the watershed of the Right Fork of Whitmore Canyon, the company has committed to installing flow meters in the underground mine works. Longwall panels #20, 21 and 22 are the only panels proposed to mine within the Right Fork watershed, as depicted on Map 5-4A and Map 7-8. (It should be noted that there will be no longwall mining conducted under the Right Fork; the only mining to extend under the Right Fork will be the development mining associated with the gate-roads and bleeder entries.) Any water encountered in mining these panels will have to be pumped out of the mine through any of the six development entries (gate-roads) associated with these panels (2 each gate-roads per panel). Therefore the company commits to installing a total of 6 each flow meters, one in each gate-road of these three panels in order to measure the amount of water encountered in the mine within the vicinity of the Right Fork drainage. The flow meters will be installed at the sumps where the gate-roads connect to the main entries, and where the mine-water is collected and pumped into the main discharge waterline.

The specific location of these flow meters is shown on the accompanying map in Appendix 7-16, and also Map 7-7. The flow meters will be installed at such time that any water is encountered in quantities sufficient to require pumping. The flow meters will be equipped to read instantaneous flow and total flow. The flow readings will be reported to the Division on a monthly basis. If the total cumulative flow from these meters exceeds 250 gpm (0.5 cfs) for a period of more than one month, the company will notify the Division and will initiate a hydrogeologic investigation and a subsequent revision of the PHC. The flow meters will be monitored and reported as long as any water continues to flow from these panels, or until this area of the mine is sealed, according to MSHA and BLM approvals. Under the current production schedule (as of December, 2011), the entire lower end of the mine will be sealed around March, 2013 for safety reasons, at which time the only remaining mining will be several small longwall panels near the outcrop.

U-19E
U-18E
U-17E
U-16E
U-15E
U-14E
PANEL #22
PANEL #21
PANEL #20
PANEL #19
PANEL #18
BARRIER
BARRIER
3000' COVER
2500' COVER
2500' COVER
WHITMORE CANYON
RIGHT FORK
LEFT FORK
WHITMORE CANYON
GRASSY TRAIL RESERVOIR
Federal Lease UTU-78652(M)
PENTA FEE - 3
PENTA FEE - 2
PENTA FEE - 1
19th EAST
18th EAST
17th EAST
16th EAST
15th EAST
14th EAST
13.1/2 EAST
13th EAST
12th EAST
11th EAST
10th EAST
9th RIGHT
17th WEST
15th WEST
14th WEST
13th WEST
12th WEST
11th WEST
10th WEST
NORTH MAINS
SUMP 23
SUMP 22
SUMP 21
SUMP 20
SUMP 19
SUMP 18
SUMP 16
SUMP 15
SUMP 14
SUMP 13
SUMP 12
OCTOBER 11
300 0 600 1200 FEET

NOTE:
MINE WORKINGS ARE CURRENT AS OF 7 NOVEMBER 2011.

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs 12/7/11 PROFESSIONAL ENGINEER

KEY

- FLOW METER (U-14E)
- PERMIT LINE
- LEASE LINE
- MINED WORKINGS
- FUTURE WORKINGS
- INDEX COVER LINES (500' INTERVALS)
- INTERMEDIATE COVER LINES (100' INTERVALS)

APPENDIX 7-16
UNDERGROUND FLOW METERS

WEST RIDGE RESOURCES, INC.

794 NORTH "C" CANYON ROAD
EAST CARBON, UTAH 84520

MSHA MINE ID # 42-02233

DRAWN BY: PJ	SCALE: 1" = 600'
APPROVED BY: DH	DATE: 7 DEC. 2011
SHEET:	PLATE #1 of 1

J:\Current Drawings\MRP Maps\West Ridge Mine\Current 10-31-11\WR RF Whitmore Canyon Flow Meters.dwg, Layout1, 12/7/2011 11:09:17 AM

APPENDIX 7-17
DIV WATER RIGHTS CORRESPONDENCE
WATER RIGHTS.....RIGHT FORK, WHITMORE CYN

APPENDIX 7-17

DIVISION WATER RIGHTS CORRESPONDENCE

WATER RIGHTS IN RIGHT FORK, WHITMORE CANYON

GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Water Rights

MICHAEL R. STYLER
Executive Director

KENT L. JONES
State Engineer/Division Director

December 9, 2011

Dave Shaver, Manager
West Ridge Resources, Inc.
P.O. Box 910
East Carbon, Utah 84520-0910

Subject: Water Rights Consultation Related to Extraction of Longwall Panel #22, Task #3894, West Ridge Resources, Inc., West Ridge Mine, C/007/0041

Dear Mr. Shaver,

A review of water rights on the Right Fork of Whitmore Canyon has been completed. This review identifies the water rights associated with the springs and seeps located in the *Report of Spring and Seep Survey in the Right Fork of Whitmore Canyon Area* (Petersen Hydrologic, LLC, August 3, 2011, Appendix 7-6B). Included with this review is a map showing water rights in and near the subject area and a distribution schedule for water rights on Grassy Trail Creek.

Grassy Trail Creek Appropriation

Grassy Trail Creek and its associated drainage basin, upstream from the major diversion points located at Grassy Trail Dam and along the stream channel to a point below East Carbon City, are considered **Fully Appropriated**. Water rights established on the stream generally exceed in flow and volume the available water supply. All of the surface and underground sources of water within the drainage that contribute as direct flow or storage supply to Grassy Trail Creek are considered **State Appropriated** water needed to satisfy existing downstream rights.

The distribution schedule shows the stream has early decreed and appropriated rights for direct flow and storage. Some of the earliest rights date to 1878. The rights shown on the schedule represent that the stream is fully appropriated up to a flow volume of 38.325 cubic feet per second (cfs), a storage volume of 918 acre-feet (af) associated with Grassy Trail Reservoir and an estimated 8,500 af of beneficial use for irrigation, and domestic with an additional unevaluated volume for mining, industrial and municipal.

Stock Watering Rights

Point to point stock watering rights were identified within the subject area. Water within these stretches of stream as well as all surface and underground source water including springs or seeps feeding into the stream through these stretches are considered **State Appropriated** water supplying the point to point stock watering rights. The attached map shows the location of the point to point rights, for livestock watering directly on the stream. They are established on the Right Hand Fork of Whitmore Canyon from Grassy Trail Reservoir to the upper headwater reaches of all the major drainages entering the Right Hand Fork. Individual stock watering rights directly on a spring were also identified adjacent to the subject area in Section 5 as shown on the attached map.

If you have any questions regarding this information, please feel free to contact me at 801-538-7240.

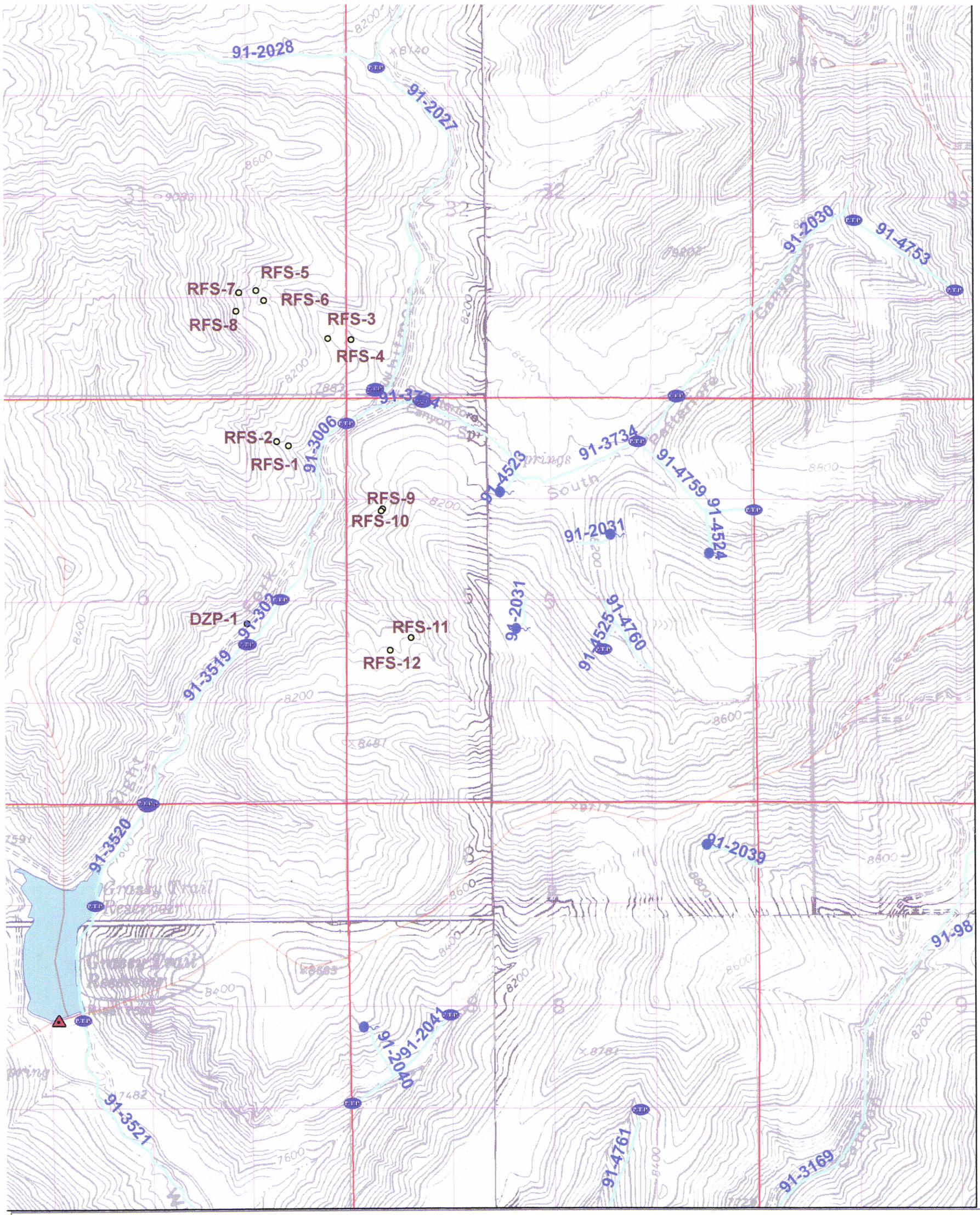
Sincerely,

Marc Stilson, P.E.
SE Regional Engineer

DELIVERY SCHEDULE - GRASSY TRAIL CREEK

FEBRUARY 3, 1999

Owner of Record	WUC #	Dec/Appl	Flow	Cum. cfs/AF	Priority
East Carbon City	91-360	Decree	2.00 cfs	2.00 cfs	1878
Sunnyside Cogeneration	91-361	Decree	0.50 cfs	2.50 cfs	1878
Sunnyside City	91-362	Decree	1.00 cfs	3.50 cfs	1878
East Carbon City	91-363	Decree	1.50 cfs	5.00 cfs	1878
Sunnyside Cogeneration	91-372	Decree	5.575 cfs	10.575 cfs	1885
Sunnyside City	91-367	Decree	0.875 cfs	11.45 cfs	1888
EC City & SS City	91-368	Decree	0.625 cfs	12.075 cfs	1888
EC City & SS City	91-369	Decree	0.25 cfs	12.325 cfs	1888
EC City & SS City	91-28	C808	2.20 cfs	14.525 cfs	6-10-13
EC City & SS City	91-84	C2047	2.00 cfs	16.525 cfs	1-31-24
C City & SS City	91-114	C2426	1.80 cfs	18.325 cfs	7-5-35
Sunnyside Cogeneration	91-118	C4137	5.00 cfs	23.325 cfs	11-5-37
EC City & SS City	91-125	C7765	5.00 cfs	28.325 cfs	2-13-40
East Carbon City	91-140	C5520	50.00 AF	50.00 AF	12-18-43
East Carbon City	91-141	C7791	5.00 cfs	33.325 cfs	12-18-43
East Carbon City	91-142	C5614	50.00 AF	100.00 AF	12-18-43
Sunnyside Cogeneration	91-143	C5510	16.67 AF	116.67 AF	12-18-43
EC City & SS City	91-144	C7959	33.33 AF	150.00 AF	12-18-43
Sunnyside Cogeneration	91-145	C5684	16.67 AF	166.67 AF	12-18-43
EC City & SS City	91-146	C7958	33.33 AF	200.00 AF	12-18-43
Sunnyside Cogeneration	91-158	C7792	65.00 AF	265.00 AF	8-19-47
Sunnyside Cogeneration	91-159	C5670	5.00 cfs	38.325 cfs	9-24-47
EC City & SS City	91-178	C5901	916.00 AF	1181.00 AF	12-19-51



State of Utah Appropriated Water Rights

Legend

- Westridge Spring Seep Survey

TYPE

- Abandonded Well
- Drain
- Point to Point
- Rediversion
- Return
- Spring
- Surface
- Underground

- Stockwater Point to Point
- Drainage Boundaries
- Section Line
- 40 Acre Parcel (Approx)

1 inch = 1,333 feet

1:16,001

Date: 12/1/2011

By: Dave Horsley

UTAH DNR WATER RIGHTS

State of Utah Appropriated Water Rights

Legend

- Westridge Spring Seep Survey

TYPE

- Abandonded Well
- Drain
- Point to Point
- Rediversion
- Return
- Spring
- Surface
- Underground

- Stockwater Point to Point
- Drainage Boundaries
- Section Line
- 40 Acre Parcel (Approx)

1 inch = 1,333 feet

1:16,001

Date: 12/1/2011

By: Dave Horsley

UTAH DNR WATER RIGHTS

This Plate has been added by Company

CONFIDENTIAL INFORMATION

NOTE TO REVIEWERS:

THE FOLLOWING INFORMATION IS INCLUDED IN THE CONFIDENTIAL BINDER:

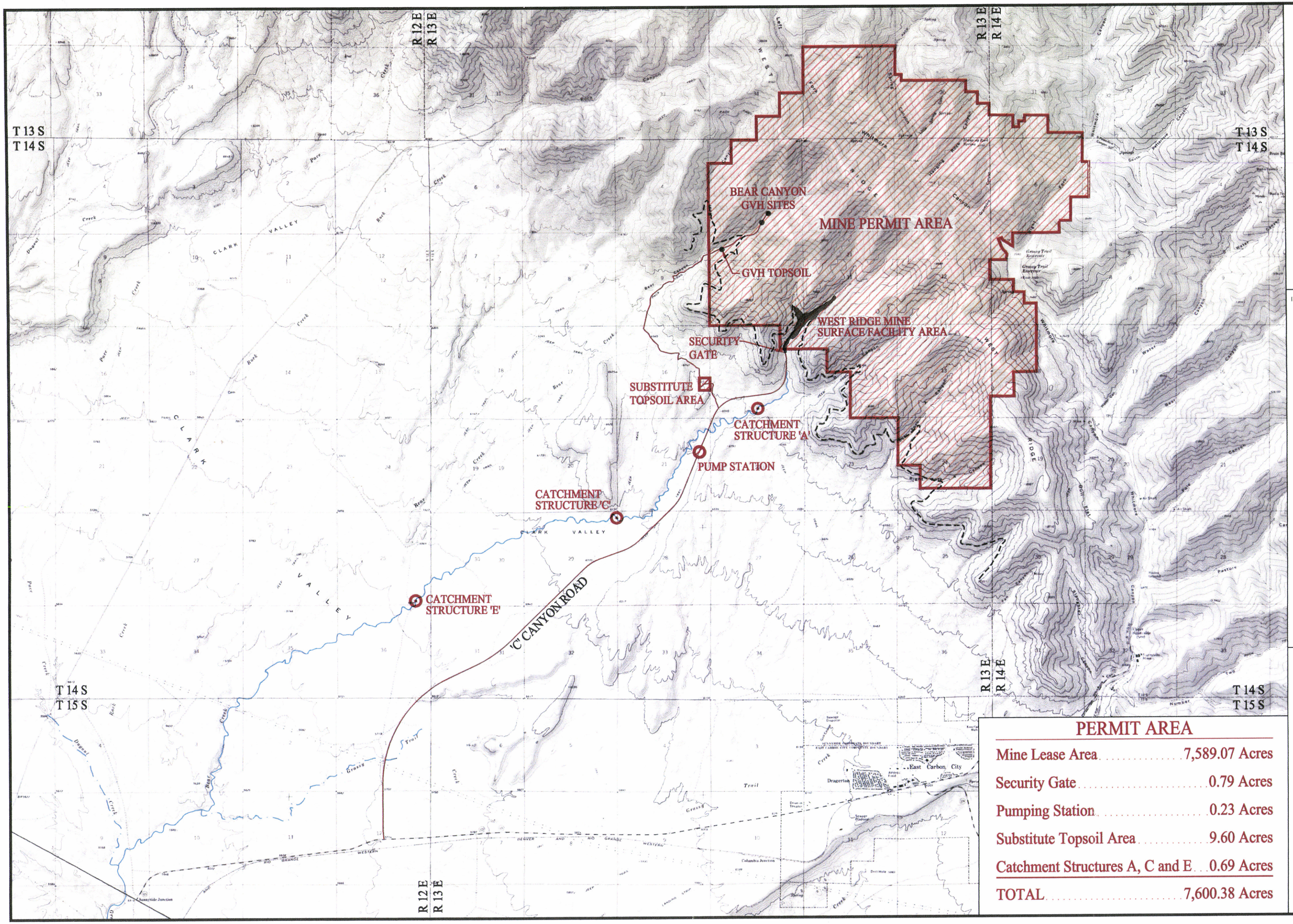
1) ARCHEOLOGICAL INFOR MATION FROM SENCO-PHENIX ARCHEOLOGICAL CONSULTANTS

2) MAP 4-2, ARCHEOLOGICAL MAP

3) 2011 RAPTOR SURVEY INFORMATION FROM eis ENVIRONMENTAL CONSULTANTS

4) MAP 3-4A, WILDLIFE MAP-RAPTOR SURVEY

MAPS



WEST RIDGE RESOURCES, INC.

SCALE: 1"=5000'

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
7/6/11
PROFESSIONAL ENGINEER

LEGEND:
- Lease Areas
- Surface Facility Area
- GVH Site
- Outcrop

N

PERMIT AREA

Mine Lease Area	7,589.07 Acres
Security Gate	0.79 Acres
Pumping Station	0.23 Acres
Substitute Topsoil Area	9.60 Acres
Catchment Structures A, C and E	0.69 Acres
TOTAL	7,600.38 Acres

WEST RIDGE MINE
Map 1-0, Permit Map
Map 1-1, Location Map

DATE: 7-06-11 REV: 15 ACAD REF: Maps 1-0 and 1-1 Rev 15

BEAR CANYON GVH SITE

GVH TOPSOIL

TOPSOIL BORROW AREA

CATCHMENT STRUCTURE 'A'

PUMP STATION PERMIT AREA

CARBON COUNTY ROAD

46 KV POWERLINE

T. 13 S.

T. 14 S.

R. 13 E.

R. 14 E.

SOIL MAP UNITS

5	Beje complex
7	Beje-Trag complex
21	Croydon loam, 8 to 30 percent slopes
24	Datino Variant very stony loam, 50 to 80 percent slopes
27	Doney-Toze families complex
33	Gerst-Badland-Rubbleland complex, 15 to 50 percent slopes
36	Gerst-Strych-Badland complex, 3 to 50 percent slopes
37	Gerst-Strych-Badland complex, 50 to 70 percent slopes
48	Haverdad loam, 1 to 8 percent slopes
49	Haverdad loam, alkali, 0 to 3 percent slopes
52	Hernandez family, 3 to 8 percent slopes
62	Midfork family-Commodore complex
71	Pathead extremely bouldery fine sandy loam, 40 to 70 percent slopes
75	Perma family, 15 to 40 percent slopes
76	Perma family-Datino complex
84	Podo-Rock outcrop complex
95	Rock outcrop
96	Rock outcrop-Rubbleland-Travessilla complex
101	Senchert loam, 3 to 15 percent slopes
103	Senchert-Toze family complex
104	Senchert family, 3 to 15 percent slopes
107	Shupert-Winetti complex
113	Strych very stony loam, 3 to 15 percent slopes
125	Unita-Toze families complex

Catchment Structures C and E (Permit Areas)
Catchment Structure C: Soil Unit 36
Catchment Structure E: Soil Unit 49
See Appendix 5-15; Attachment 11
See Map 1-1 for Catchment Locations
Source: Carbon County Soil Survey, U.S.D.A., Soil Conservation Service

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

WEST RIDGE MINE
Map 2-1
Regional Soil Map

DATE: 7-06-11 REV: 23 ACAD REF: MAP2-1 REGSOIL REV23

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Soil Mapping Boundary
- Soil Map Number (113)

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

2011 Interpretations from aerial photography by Mount Nebo Scientific, Inc. - random ground-truthing to be conducted in Spring/ Summer of 2012.

BEAR CANYON GVH SITES

Pinyon/Juniper Reference Area

Douglas Fir/Maple Reference Area

Douglas Fir/Maple (old reference area) 1997 field data

Douglas Fir/Rocky Mtn. Juniper Reference Area

TOPSOIL BORROW AREA

CATCHMENT STRUCTURE 'A'

PUMP STATION PERMIT AREA

FEE

VEGETATION COMMUNITIES

- Douglas Fir
- Pinyon/Juniper
- Sagebrush/Grass/Herbland
- Aspen
- Mountain Brush/Sagebrush
- Mixed Conifer
- Open Water
- Riparian

Note: Vegetation communities based on interpretations from aerial photography (8/20/97) with some ground-checking in 2003 by Mount Nebo Scientific, Inc.

Note: See Appendix 3-12 for description of Whitmore Canyon riparian areas.

Catchment Structures C and E (Permit Areas)
Catchment Structure C: Pinyon/Juniper
Catchment Structure E: Sagebrush
See Appendix 5-15; Attachment 11

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs 10/31 PROFESSIONAL ENGINEER

WEST RIDGE MINE
Map 3-1
General Vegetation Communities

DATE: 10-31-11 REV: 28 ACAD REF: MAP3-1 GENVEG REV28

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

DW-C
(DEER, WINTER
CRUCIAL)

DS-C
(DEER, SUMMER
CRUCIAL)

DY-S
(DEER, YEARLONG
SUBSTANTIAL)

DW-C
(DEER, WINTER
CRUCIAL)

DY-S
(DEER, YEARLONG
SUBSTANTIAL)

FEE

BEAR CANYON
GVH SITES

TOPSOIL BORROW
AREA

CATCHMENT
STRUCTURE 'A'

PUMP STATION
PERMIT AREA

DW-S
DEER, WINTER
SUBSTANTIAL)

I CERTIFY THIS MAP TO BE TRUE AND CORRECT
TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
PROFESSIONAL ENGINEER

Catchment Structures C and E (Permit Areas)
Catchment Structure C: Winter Range
Catchment Structure E: Unclassified
See Appendix 5-15; Attachment 11

Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4B

Wildlife Map - Deer Range

DATE: 7-06-11 REV: 23 ACAD REF: MAP3-4B DEER REV23

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- GVH Site
- DW-S
- DW-C
- DS-C
- DY-S

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

ES-C
(ELK, SUMMER
CRUCIAL)

EY-S
(ELK, YEAR-LONG
SUBSTANTIAL)

EY-C
(ELK, YEAR-LONG
CRUCIAL)

FEE

BEAR CANYON
GVH SITES

TOPSOIL BORROW
AREA

CATCHMENT
STRUCTURE 'A'

PUMP STATION
PERMIT AREA

I CERTIFY THIS MAP TO BE TRUE AND CORRECT
TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
PROFESSIONAL ENGINEER

Catchment Structures C and E (Permit Areas)
Catchment Structure C: Winter Range
Catchment Structure E: Winter Range
See Appendix 5-15; Attachment 11

Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4C

Wildlife Map - Elk Range

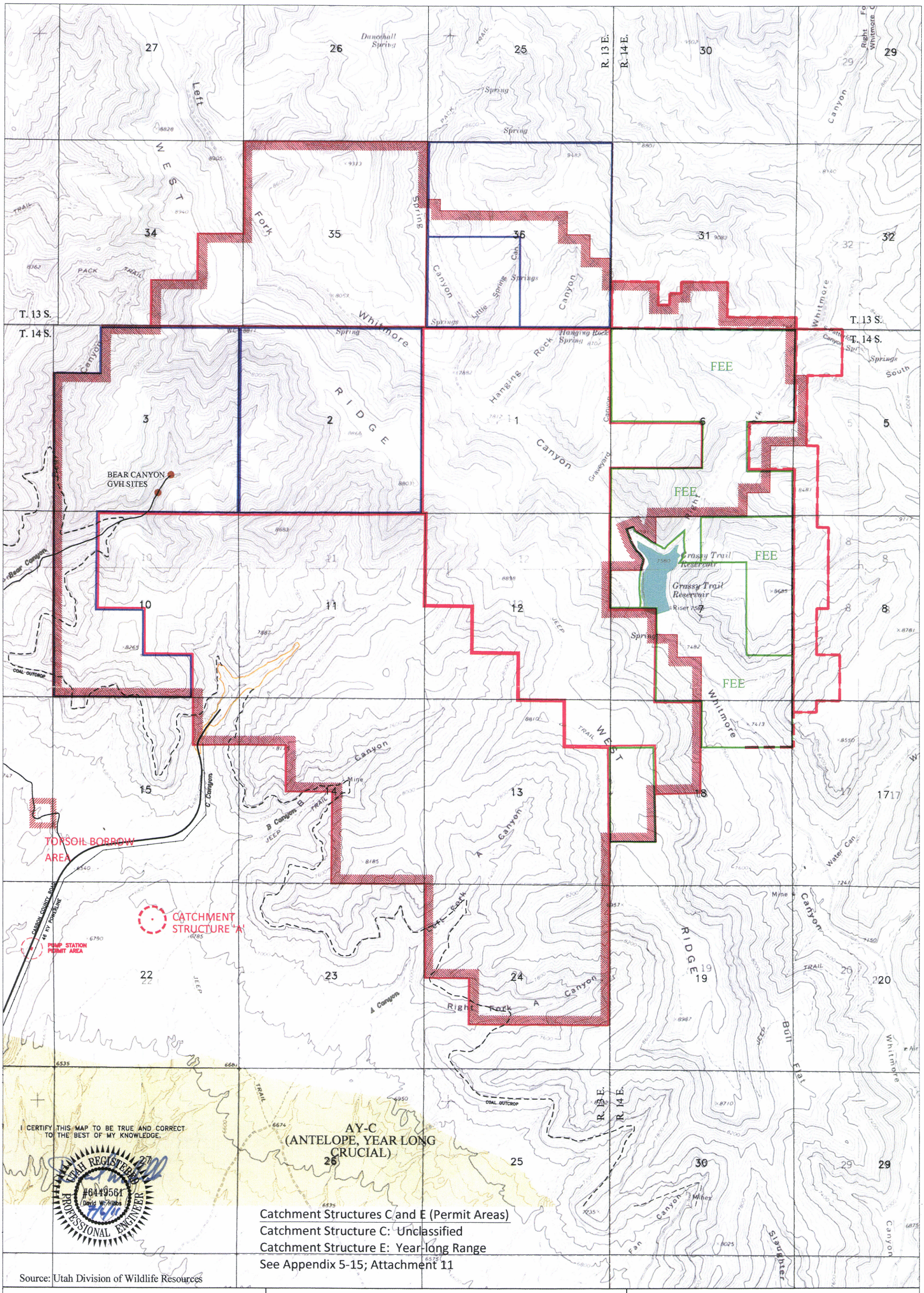
DATE: 7-06-11 REV: 23 ACAD REF: MAP 3-4C ELK REV23

Permit Boundary
Federal Lease
State Lease
Private Fee
Surface Facility Area
GVH Site
EY-C
ES-C
EY-S

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'



I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

Catchment Structures C and E (Permit Areas)
Catchment Structure C: Unclassified
Catchment Structure E: Year-long Range
See Appendix 5-15; Attachment 11

Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4D

Wildlife Map - Antelope Range

DATE: 7-06-11 REV: 23 ACAD REF: MAP3-4D ANTELOPE REV23

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- GVH Site
- AY-H

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

PACE CANYON ALLOTMENT

COW CANYON ALLOTMENT

ROCK CANYON ALLOTMENT

SHEEP CANYON ALLOTMENT

NON-ALLOTTED

FEE

NON-ALLOTTED (PRIVATE)

BEAR CANYON ALLOTMENT

MUD SPRINGS ALLOTMENT

PRIVATE CABIN

BEAR CANYON GVH SITES

GVH TOPSOIL

TOPSOIL BORROW AREA

CATCHMENT STRUCTURE 'A'

PUMP STATION PERMIT AREA

Grassy Trail Reservoir

Riser 7587

T. 13 S.

T. 14 S.

R. 13 E.

R. 14 E.

Catchment Structures C and E (Permit Areas)
Catchment Structure C: Mud Springs Allotment
Catchment Structure E: Mud Springs Allotment
See Appendix 5-15; Attachment 11

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs 7/6/11 PROFESSIONAL ENGINEER

SYMBOL LEGEND

Extent of Water Right
Impoundment
Fence
Spring
Locked Gate

Refer to Map 7-3 for State Appropriated Water Rights

WEST RIDGE MINE

Map 4-1

Existing Land Use

DATE: 7-06-11 REV: 24 ACAD REF: MAP4-1 LANDUSE REV24

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Grazing Allotment Boundary

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

N & ARDITH THAYN

GLEN L. WELLS

DAVE HINKINS

FEDERAL LEASE
UTU-78562

STATE LEASE
ML 51744

PENTA CREEK/
MAGNIFICENT SEVEN

STATE LEASE
ML 47711

DAVE HINKINS, ET AL.

U.S.A.

DAVE HINKINS, ET AL.

T. 13 S.

T. 14 S.

STATE LEASE
ML 49287

BEAR CANYON
GVH SITES

GVH TOPSOIL

PENTA CREEK/
MAGNIFICENT
SEVEN

STATE LEASE
ML 47711

MATT
RAUHALA

U.S.A.

PENTA CREEK/
MAGNIFICENT SEVEN

FEE

U.S.A.

DAVE HINKINS, ET AL.

U.S.A.

PENTA CREEK/
MAGNIFICENT SEVEN
FEDERAL LEASE
UTU-78562

FEE

DAVE HINKINS, ET AL.

U.S.A.

FEE

U.S.A.

U.S.A.

FEDERAL LEASE
SL-068754

U.S.A.

U.S.A.

U.S.A.

U.S.A.

UTAH REVERSE
EXCHANGE, LLC

PENTA CREEK/
MAGNIFICENT SEVEN

U.S.A.

U.S.A.

R. 13 E.

R. 14 E.

I CERTIFY THIS MAP TO BE TRUE AND CORRECT
TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
PROFESSIONAL ENGINEER

Catchment Structures C and E (Permit Areas)
Catchment Structure C: U.S.A. (BLM)
Catchment Structure E: U.S.A. (BLM)
See Appendix 5-15; Attachment 11

WEST RIDGE MINE
Map 5-2
Surface Ownership Map

DATE: 7-06-11 REV: 24 ACAD REF: MAP5-2 SURFOWN REV24

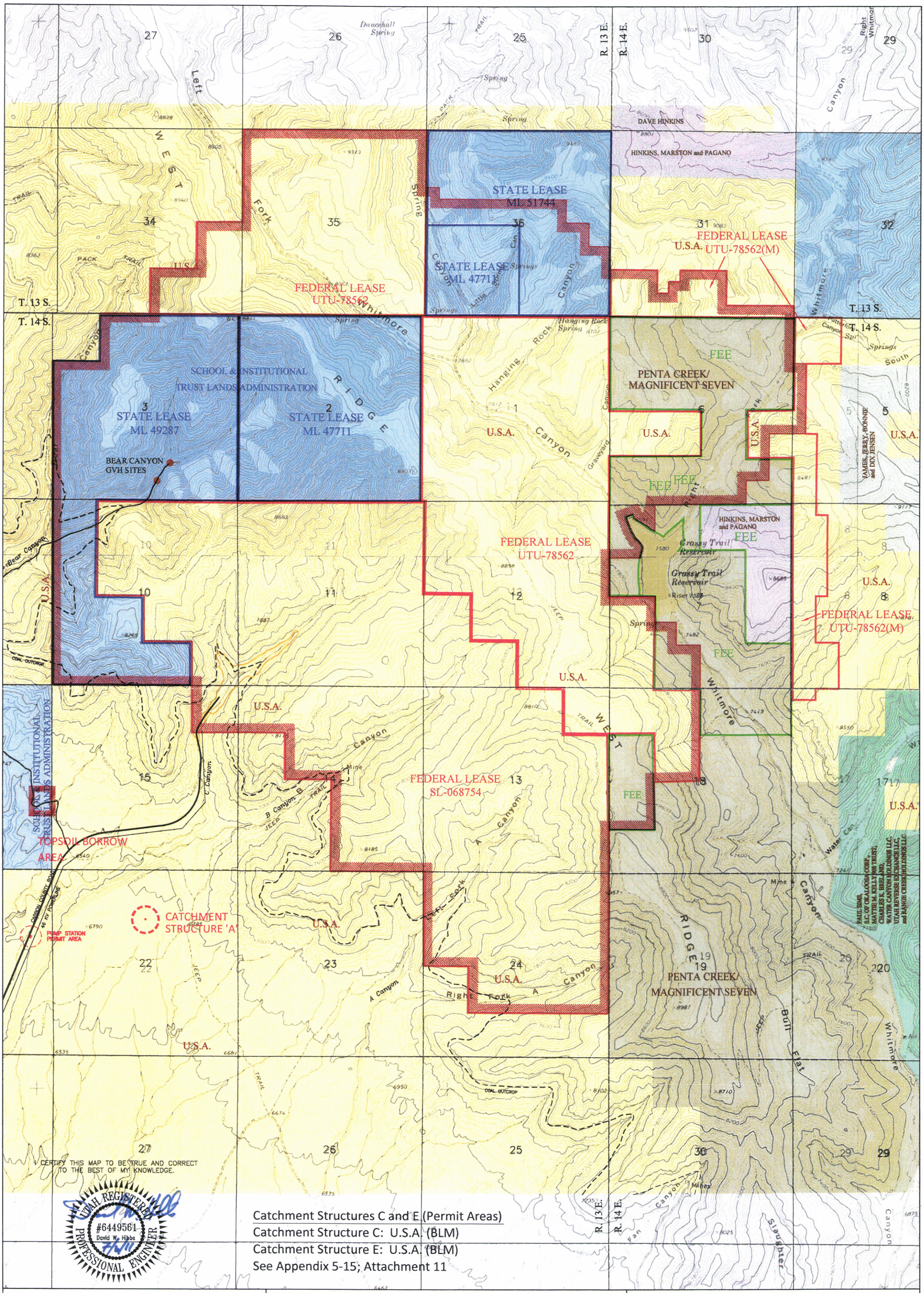
LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop
- School Trust Land (SITLA)
- Penta Creek/ Magnificent Seven
- U.S.A. (BLM)
- Dave Hinkins, et al.
- Glen L. Wells
- Matt Rauhala
- Milton & Ardith Thayn
- East Carbon City
- Utah Reverse Exchange

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'



I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs PROFESSIONAL ENGINEER

Catchment Structures C and E (Permit Areas)
Catchment Structure C: U.S.A. (BLM)
Catchment Structure E: U.S.A. (BLM)
See Appendix 5-15; Attachment 11

WEST RIDGE MINE

Map 5-3

Sub-surface Ownership Map

DATE: 7-06-11 REV: 24 ACAD REF: MAP5-3 SUBSURFOWNREV24

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop
- School Trust Lands (SITLA)
- Penta Creek/ Magnificent Seven
- U.S.A. (BLM)
- Dave Hinkins, et al.
- East Carbon City
- James T. Jensen, et al.
- Paul Sims, et al.

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

STATE LEASE
ML 51744

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
UTU-78562(M)

PANEL #23

PANEL #17

PANEL #22

PANEL #21

PANEL #20

PANEL #19

PANEL #18

STATE LEASE
ML 49287

STATE LEASE
ML 47711

BEAR CANYON
GVH SITES

Whitmore Canyon

PC FEE

Grassy Trail
Reservoir

Reservoir

HINKINS
FEE

PC FEE

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
UTU-78562(M)

FEDERAL LEASE
SL-068731

CARBON COUNTY ROAD

46 KV POWERLINE

PUMP STATION
PERMIT AREA

Strike

73°

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

I CERTIFY THIS MAP TO BE TRUE AND CORRECT
TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
7/6/11
PROFESSIONAL ENGINEER

YEAR KEY:

- 2011
- 2012
- 2013
- 2014
- Mined Area

NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of July 5, 2011.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

WEST RIDGE MINE

Map 5-4A

Mining Projections

DATE: 7-06-11 REV: 23 ACAD REF: WRTIMEA REV23

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- GVH Site
- Outcrop

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

G:\Current Drawings\MRP Maps\West Ridge Mine\Current 7-05-11\Wrtimea REV23.dwg, 5500 11x17, 7/6/2011 3:15:43 PM

STATE LEASE
ML 51744

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
UTU-78562(M)

PANEL #23

PANEL #17

PANEL #22

PANEL #21

PANEL #20

PANEL #19

PANEL #18

PC FEE

STATE LEASE
ML 49287

STATE LEASE
ML 47711

BEAR CANYON
GVH SITE

Grassy Trail
Reservoir

HINKINS
FEE

PC FEE

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
UTU-78562(M)

FEDERAL LEASE
SL-058731

CARBON COUNTY ROAD
46 KV POWERLINE

PUMP STATION
PERMIT AREA

Strike

12%

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

I CERTIFY THIS MAP TO BE TRUE AND CORRECT
TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
7/6/11
PROFESSIONAL ENGINEER

NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of July 5, 2011.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

YEAR KEY:

- 2011
- 2012
- 2013
- 2014
- 2015
- Mined Area

WEST RIDGE MINE

Map 5-4B

Mining Projections

DATE: 7-06-11 REV: 24 ACAD REF: WRTIMEB REV24

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- GVH Site
- Outcrop

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

G:\Current Drawings\MRP Maps\West Ridge Mine\Current 7-05-11\Wrtimeb REV24.dwg, 5500-11x17, 7/6/2011 3:10:00 PM

REFER TO APPENDIX S-18 FOR SUBSIDENCE DATA IN THE RIGHT FORK OF WHITMORE CANYON

STATE LEASE ML 51744

STATE LEASE ML 47711

FEDERAL LEASE UTU-78562

STATE LEASE ML 49287

STATE LEASE ML 47711

FEDERAL LEASE SL-068754

FEE

S-34

S-35

AER. BY S 1/4 34

CABIN

R. W. OF BEAR

AER. N-12

BEAR CANYON GVH SITES

AERIAL #1

AERIAL #2

AERIAL #7

AERIAL #8

AERIAL #97B

AERIAL #22

AERIAL #173

AERIAL #24

AERIAL #11

B CANYON 2

B CANYON 1

AERIAL W 1/4 SEC. 3

S-15

AERIAL #40

AERIAL #12

AERIAL #13

NEW 13

BEAVER

WATER CANYON

Grassy Trail Reservoir

Kaiser Steel Corp. Sunnyside Mine Workings (Inactive)

PANEL #23

PANEL #22

PANEL #21

PANEL #20

PANEL #19

PANEL #18

3000' COVER

2500' COVER

2000' COVER

1500' COVER

1000' COVER

500' COVER

C–Canyon

B–Canyon

A–Canyon

Strike

15°

CARBON COUNTY ROAD

46 KV POWERLINE

PUMP STATION PERMIT AREA

NOTE:

Mine projections are subject to change depending on conditions encountered in the underground mine workings.

Actual mine works are shown as of October 15, 2011.

Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.

No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.

West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

Longwall panels will be reconfigured as needed to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future.

Additional control points will be added as mine advances.

ERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 10/31/11

S-25

WEST RIDGE MINE

Map 5-7

Subsidence Map

DATE: 10-31-11 REV: 26 ACAD REF: MAP5-7A SUBSIDE REV26

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- Outcrop
- Cover
- Drill Hole
- Possible Subsidence Area
- Existing Photogammetric Control Points

S-7

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

STATE LEASE
ML 51744

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
SL-068754

STATE LEASE
ML 49287

STATE LEASE
ML 47711

FEE

FEE

FEE

FEE

BEAR CANYON
GVH SITES

PUMP STATION
PERMIT AREA

T. 13 S.

T. 14 S.

R. 13 E.

R. 14 E.

FORMATION LEGEND:

Quaternary
- Qal — Alluvium Undifferentiated
- Ql — Landslide Deposits
- Qsw — Slope-wash Deposits

Miocene(?)
- QTpm — Pediment Mantle

Tertiary
- Tgm — Middle Member
- Tgl — Lower Member
- Tc — Colton Formation

Tertiary and Cretaceous
- TKfn — Flagstaff Limestone and North Horn Formation

Cretaceous
- Kpr — Price River Formation
- Kc — Castlegate Sandstone
- Kbh — Blackhawk Formation
- Kmbg — Main Body of the Blue Gate Member

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs PROFESSIONAL ENGINEER

Refer to Map 6-1A for cross-section.

WEST RIDGE MINE

Map 6-1

Regional Geology Map

DATE: 7-06-11 REV: 21 ACAD REF: MAP6-1 GEOLOGY REV21

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Fault

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

R. 13 E.
R. 14 E.

T. 13 S.
T. 14 S.

STATE LEASE
ML 51744

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

STATE LEASE
ML 49287

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
SL-068758

PANEL #23
PANEL #17
PANEL #22
PANEL #21
PANEL #20
PANEL #19
PANEL #18

FEE
FEE
FEE

PRIVATE CABIN

Whitmore Canyon

Grassy Trail Reservoir

BEAR CANYON GVH SITES

C-Canyon
B-Canyon
A-Canyon

CARBON COUNTY ROAD
46 KV POWERLINE

PUMP STATION PERMIT AREA

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

N-8 N-17 N-6 N-5 N-4 B-8 B-7 B-3 B-6 B-4 B-5 B-1 B-2 U-2 U-3 U-4 U-5 U-6 U-7 U-8 S-17 86-2 S-11 S-12 S-10 S-9 S-8 S-7 S-6 S-5 S-4 S-3 S-2 S-1 (237) H-16 H-31 H-17 MB-1 CS62-3 CS62-2 CS62-1 CS81-2 CS81-1 BC-1 BC-2 BC-5 BC-6 BC-9 BC-8 235 81 97 86 99 96 95 94 90 92 93 91 83

4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600

Strike 13%

NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of July 5, 2011.
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No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
PROFESSIONAL ENGINEER

WEST RIDGE MINE

Map 6-2

Coal Seam Structure Map

DATE: 7-06-11 REV: 24 ACAD REF: MAP6-2 STRUCTURE REV24

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Structure Contour (Base of Lower Sunnyside Seam)
- Drill Hole/Channel Samples S-7

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

FEDERAL LEASE
UTU-78562

STATE LEASE
ML 51744

STATE LEASE
ML 47711

STATE LEASE
ML 49287

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
SL-068758

PANEL #23

PANEL #17

PANEL #22

PANEL #21

PANEL #20

PANEL #19

PANEL #18

FEE

FEE

FEE

Whitmore Canyon

Grassy Trail Reservoir

Reservoir

BEAR CANYON
GVH SITES

Bear Canyon

C-Canyon

B-Canyon

A-Canyon

Strike

15%

CARBON COUNTY ROAD
46 KV POWERLINE

PUMP STATION
PERMIT AREA

5.0'
6.0'
7.0'
8.0'
9.0'

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of July 5, 2011.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

CERTIFY THIS MAP TO BE TRUE AND CORRECT
TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
7/6/11
PROFESSIONAL ENGINEER

WEST RIDGE MINE

Map 6-3

Lower Sunnyside Coal Seam Isopach Map

DATE: 7-06-11 REV: 24 ACAD REF: MAP6-3 ISOPACH REV24

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop
- Coal Isopachs
- Drill Hole/Channel Samples S-7

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

WEST RIDGE MINE

Map 7-3

Water Rights

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 7/6/11

Refer to Appendix 7-5 for water rights information.

Catchment Structures C and E (Permit Areas)

Catchment Structure C: None

Catchment Structure E: None

See Appendix 5-15; Attachment 11

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Water Right:
  - Point to Point (91 363)
  - Spring (91 363)
- Ground Water Right (91 363)
- Municipal Water System Intake

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

DATE: 7-06-11 REV: 24 ACAD REF: MAP7-3 WATERIGHTS REV24

June 1986
Seep and Spring
Inventory Area

June 1986
Seep and Spring
Inventory Area

August 2011
Inventory Area

October 1985 Seep and Spring
Inventory Area

November 1999
Inventory Area

FEE

August 2010
Inventory Area

November 1999
Inventory Area

October 1985 Seep and Spring
Inventory Area

June 1986
Seep and Spring
Inventory Area

BEAR CANYON
GVH SITES

TOPSOIL BORROW
AREA

CATCHMENT
STRUCTURE 'A'

PUMP STATION
PERMIT AREA

Catchment Structures C and E (Permit Areas)
Catchment Structure C: None
Catchment Structure E: None
See Appendix 5-15; Attachment 11

SEEP AND SPRING LEGEND

- Seep and Spring Inventory Boundary
- F-17 — Location of Seep or Spring, October 1985
- S-208 — Location of Seep or Spring, June 1986
- △ — Spring Monitoring Station (1985-1989)
- S-208 — Location of Seep or Spring, Nov.1999
- RFS-2 — Location of Seep or Spring, Aug. 2011

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
PROFESSIONAL ENGINEER

WEST RIDGE MINE

Map 7-5

Seep/Spring Survey Map

DATE: 8-04-11 REV: 25 ACAD REF: MAP7-5 SEEP-SPRING REV25

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

\Current Drawings\MRP Maps\West Ridge Mine\Current 10-31-11\MAP7-6 MONITOR-HIS REV26.dwg, 5500 11x17, 10/31/2011 11:48:16 AM

LEGEND

Monitoring Locations

	1985/1986		1987 and later
Spring Monitoring Station	△	S-177	□ WR-2
Drill Hole Water Monitoring Location	▲		▲
Ephemeral Stream Flow Monitoring Station	○	M-5	○ ST-7
Intermittent Stream Flow Monitoring Station	◑	M-6	◑ ST-2
Perennial Stream Flow Monitoring Station	●	M-7	● ST-3

WEST RIDGE MINE
Map 7-6
Hydrologic Monitoring Map
(Historical Monitoring Locations)

.TE: 10-31-11 REV: 26 ACAD REF: MAP7-6 MONITOR-HIS REV26

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site

N

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 12/31

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

WEST RIDGE MINE
Map 7-7
Operational Monitoring Locations

DATE: 12-07-11 REV: 29 ACAD REF: MAP7-7 MONITOR-OP REV29

WEST RIDGE RESOURCES, INC.

SCALE: 1" = 2500'

SEE APPENDIX 7-16 FOR FURTHER INFORMATION OF UNDERGROUND FLOW METERS ("U" NUMBERS)

SEE APPENDIX 5-15 ATTACHMENT 10 FOR FURTHER INFORMATION OF UNDERGROUND SAMPLING POINT

BEAR CANYON GVH SITES

PATTERFORE STREAM

ROAD SPRING

SECTION 5 SPRING

FEE

T. 13 S.
T. 14 S.
R. 13 E.
R. 14 E.

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site

LEGEND

Operational Monitoring Locations

Spring Monitoring Station	WR-2
Drill Hole Water Monitoring Location	DH 86-2
Ephemeral Stream Flow Monitoring Station	ST-5
Intermittent Stream Flow Monitoring Station	ST-8
Flume Monitoring Station (Owned by East Carbon City)	RF-2
Underground Flow Meter	U-14E

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED #6449561 David W. Hibbs PROFESSIONAL ENGINEER 12/7/11

I:\17-11\Map7-7 MONITOR-OP REV29.dwg, 5500=11x17, 12/7/2011 11:08:45 AM

LEFT FORK WATERSHED

RIGHT FORK WATERSHED

STATE LEASE ML 51744

STATE LEASE ML 47711

FEDERAL LEASE UTU-78562

FEDERAL LEASE UTU-78562

FEDERAL LEASE SL-0687

STATE LEASE ML 49287

PANEL #23

PANEL #22

PANEL #21

PANEL #20

PANEL #19

PANEL #18

FEE

FEE

FEE

FEE

BEAR CANYON UVH SITE

Grassy Trail Reservoir

Kaiser Steel Corp. Sunnyside Mine Workings (Inactive)

Kaiser Steel Corp. Sunnyside Mine Workings (Inactive)

A-Canyon

B-Canyon

C-Canyon

Whitmore Canyon

Right Fork Whitmore Canyon

Left Fork

Bull Flat

RIDGE

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 11/7/11

WEST RIDGE MINE

Map 7-8

Whitmore Canyon Watershed Map

DATE: 11-07-11 REV: 2 ACAD REF: MAP7-8 WATERSHED MAP REV2

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- Outcrop
- Watershed Boundary

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=3000'