

COVER LETTER.....C1/C2 FORMS

C/007/041 Incoming

#3894

K



**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

August 8, 2011

Attn: Dana Dean  
Associate Director

Re: West Ridge Mine C/007/041  
Change to Allow Extraction of Longwall Panel 22

RECEIVED  
AUG 23 2011  
DIV. OF OIL, GAS & MINING

Dear Ms. Dean:

Enclosed are six clean copies of a change to the above-referenced permit. This change would add 273.43 acres to the existing permit, as shown on the attached map. The purpose for adding this additional area is to allow for one final longwall panel (Panel 22) to be mined in the northeastern-most portion of the leasehold. Due to the extreme depth of cover in this area, Panel 22 will be the last longwall panel to be developed in the down-dip section of the the mine.

As you review this application 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) In response to an earlier permit application of February 1, 2011, the Division has previously approved and permitted similar development-only mining under the Right Fork in this same area, namely for adjacent Panels 20 and 21. In the Technical Analysis of March 23, 2011, the Division, in its official findings, made the following statements:

*"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*

File in:

Confidential  
 Shelf  
 Expandable

Date Folder 08232011/0070041  
Incoming - See Confidential

*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."*

- 3) The development entries proposed under this current application (Panel 22) are even deeper beneath the Right Fork than those previously approved for Panels 20 and 21 (i.e., plus 2700' deep). Also, there are only two new additional sets of development entries associated with Panel 22 extending below the Right Fork, compared to the five sets previously (already) approved by the Division for Panels 20 and 21.
- 4) Longwall Panel 22 will be mining at a depth ranging from 2800'-3600', making it the deepest coal mining in the world.
- 5) Longwall Panel 22 will be mined at a hypocentric distance away from the Grassy Trail dam of more than 7000'. This compares to similar distances for previously approved Panels 18, 19, 20 and 21 of 3680', 3920', 4240', and 5560' respectively.
- 6) The existing permit area comprises 7589.07 acres. The Panel 22 amendment would add 273.43 acres. Therefore, the total permit area increase would be about 3.6%.
- 7) There would be no new surface disturbance as a result of this permit change.
- 8) The area has been surveyed for raptors, with no occurrence.
- 9) The area has been cleared by the archeologist report.
- 10) The area has been included in a recent spring and seep survey.

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:

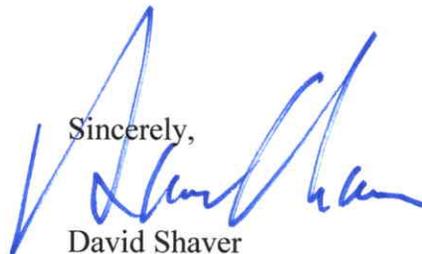
- a) *Installation and/or rehabilitation of measuring flumes in the upper and lower reaches of both Right and Left Forks of Whitmore Canyon above the reservoir (total of 4ea. flumes).*

Dana Dean  
August 1, 2011  
page 3

- b) Installation of continuous measuring/recording devices at each flume.*
- 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.*

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

## APPLICATION FOR PERMIT PROCESSING

<input type="checkbox"/> Permit Change	<input type="checkbox"/> New Permit	<input type="checkbox"/> Renewal	<input type="checkbox"/> Transfer	<input type="checkbox"/> Exploration	<input type="checkbox"/> Bond Release	Permit Number: <b>C/007/041</b>
Title of Proposal: <b>Change to allow extraction of Longwall Panel #22</b>						Mine: <b>WEST RIDGE MINE</b>
						Permittee: <b>WEST RIDGE Resources, Inc.</b>

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.

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

*[Signature]* agent 7/29/2011

Subscribed and sworn to before me this 1<sup>st</sup> day of August, 2011

My Commission Expires: \_\_\_\_\_  
 Notary Public: Linda Kerns  
 Attest: STATE OF Utah 03-27-13  
 COUNTY OF Carbon



Received by 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**

Permit Number: **C/007/041**

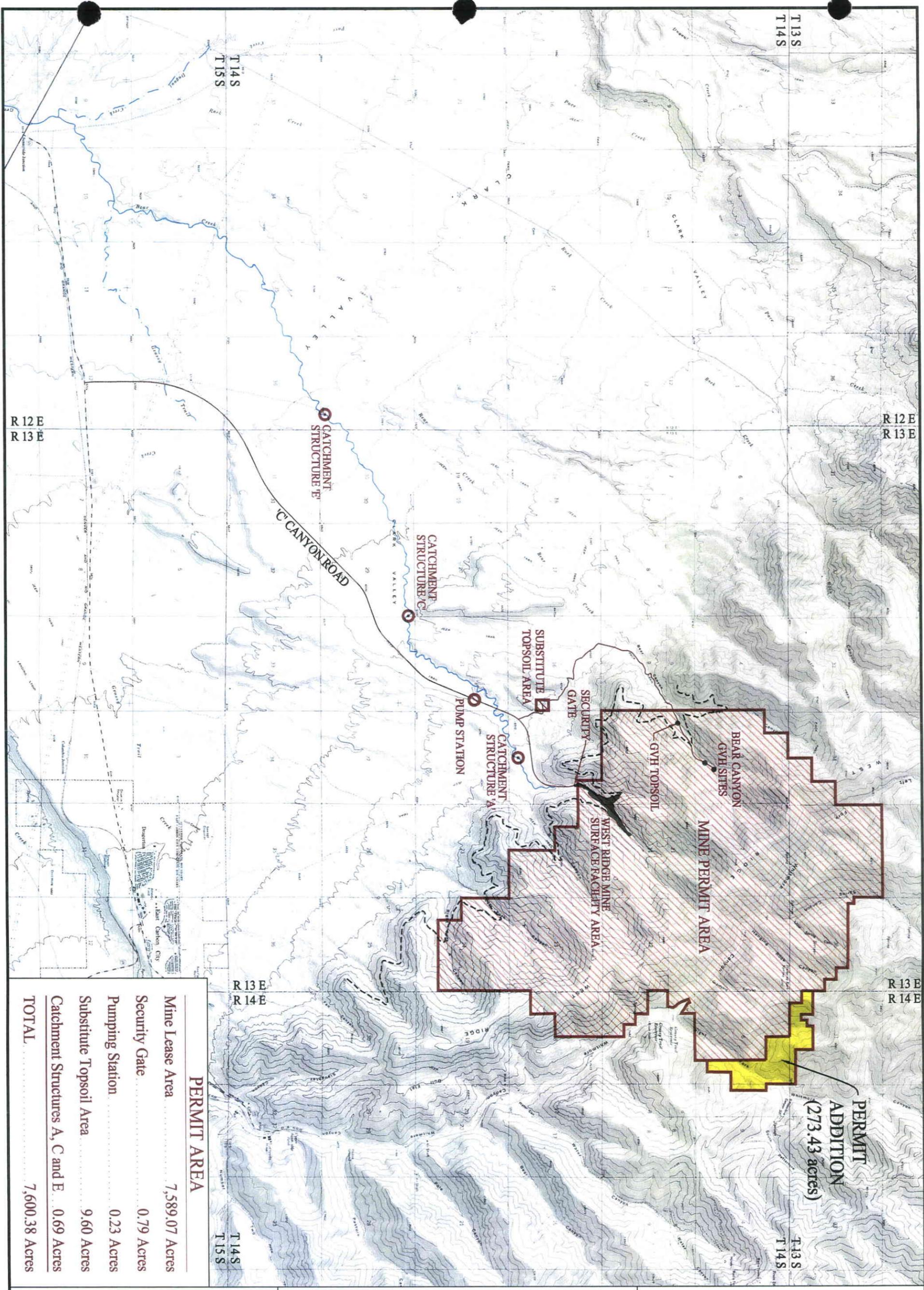
Mine: **WEST RIDGE MINE**

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
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 1 text, changes in red
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Appendix 1-4B(a) Federal Coal Lease Modification UTU-78562
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	highlighted
<input type="checkbox"/> ADD	<input checked="" type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 7 text, changes in yellow
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Appendix 7-6B 2011 Seep & Spring
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Confidential Data as noted
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Maps 1-0/1-1, 2-1, 3-1, 3-4A, 3-4B,
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	3-4C, 3-4D, 4-1, 4-2, 5-2
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	5-3, 5-4A, 5-4B, 5-7, 6-1
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	6-2, 6-3, 7-3, 7-5, 7-6, 7-7
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	
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<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	

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



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
<b>TOTAL</b>	<b>7,600.38 Acres</b>

**PERMIT ADDITION**  
(273.43 acres)

# WEST RIDGE MINE

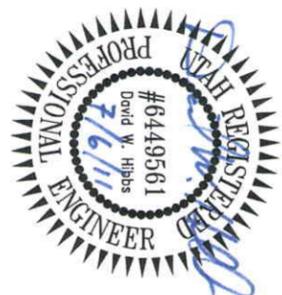
## Map 1-0, Permit Map

## Map 1-1, Location Map

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

**LEGEND:**

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

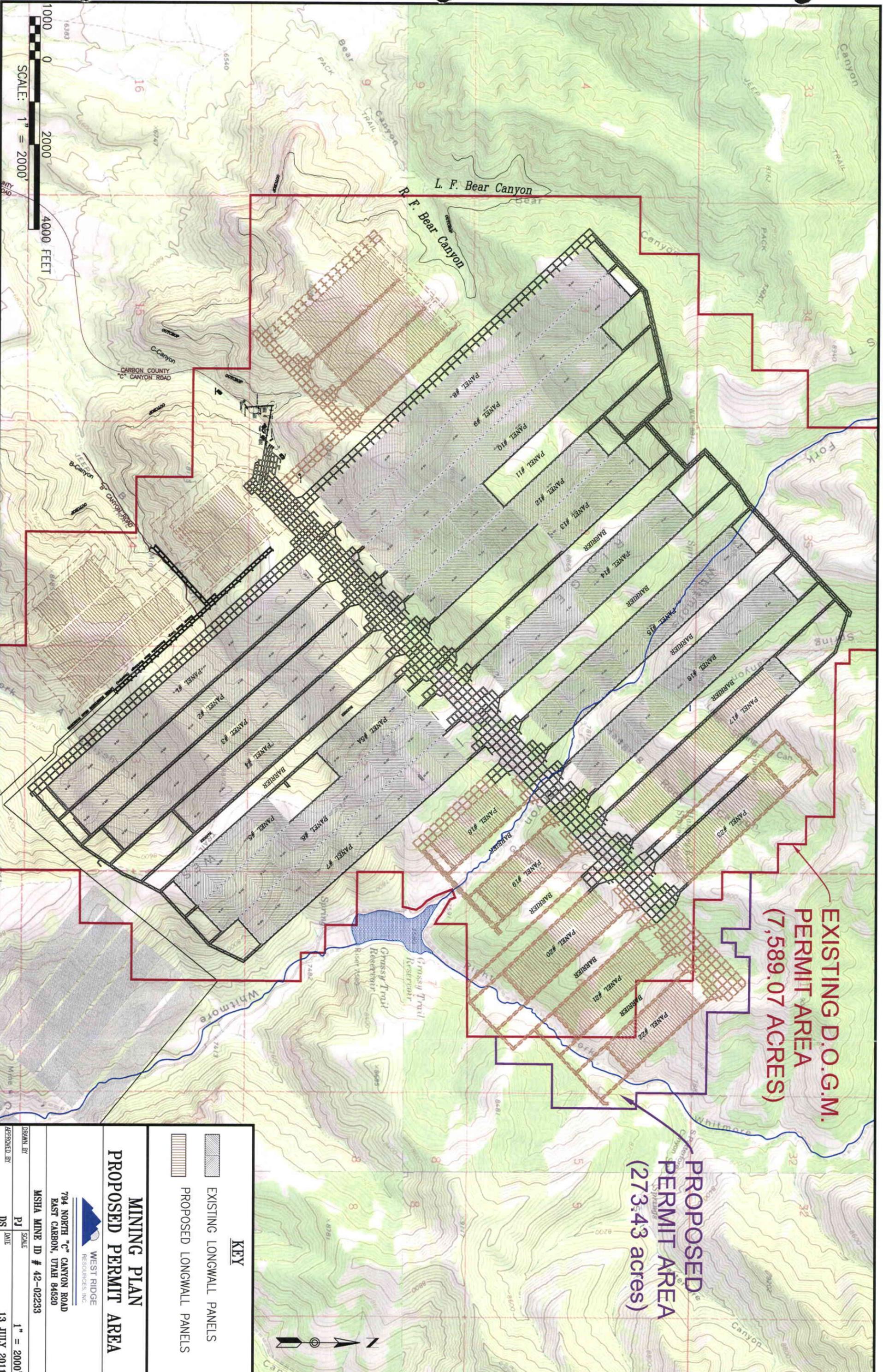


I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



**WEST RIDGE**  
RESOURCES, INC.

SCALE: 1"=5000'



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

**PROPOSED  
PERMIT AREA  
(273.43 acres)**

- 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

CHAPTER 1.....REPLACEMENT PAGES

**~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~**

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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*****
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(continued)**

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APPENDIX 1-12	Waterline/Pump House Right of Way
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APPENDIX 1-14	*****Moved*****
APPENDIX 1-15	Legal Description of Grassy Trail Reservoir

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

<b>MAP NUMBER</b>	<b>DESCRIPTION</b>	<b>SCALE</b>
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.O. 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.

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 Table 1-5 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	<u>0.23 acres</u>
	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**

<u>PARCEL</u>	<u>ACREAGE</u>	<u>LEGAL DESCRIPTION</u>
1) <u>FEDERAL COAL LEASE SL-068754</u> (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) <u>FEDERAL COAL LEASE UTU-78562</u>	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
<u>3) PUMPING STATION</u>	0.23	T 14 S, R 13 E	
(BLM R.O.W. UTU-7712)		Section 21:	NENE (0.23 acres thereof)
<u>4) CATCHMENT STRUCTURE A</u>	0.23	T 14 S, R 13 E	
(BLM R.O.W. UTU-87110)		Section 15:	SESW (0.23 acres therein)
<u>5) CATCHMENT STRUCTURE C</u>	0.23	T 14 S, R 13 E	
(BLM R.O.W. UTU-87110)		Section 28:	NWNW (0.23 acres therein)
<u>6) CATCHMENT STRUCTURE E</u>	0.23	T 14 S, R 12 E	
(BLM R.O.W. UTU-87110)		Section 25:	SESE (0.23 acres therein)
 <u>TOTAL FEDERAL</u>	 <u>5257.08 acres</u>		



**TABLE 1-3  
FEE LEASE PROPERTIES  
(PENTA CREEK)**

<u>PARCEL</u>	<u>ACREAGE</u>	<u>LEGAL DESCRIPTION</u>
1) <u>PENTA CREEK FEE LEASE</u>	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) <u>PENTA CREEK LEASE EXTENSION</u> (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) <u>PENTA CREEK LEASE EXTENSION</u> (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) <u>HINKINS FEE LEASE**</u>	160.00	T 14 S, R 14 E Section 7: N2NE, SENE, NESE
<u>TOTAL FEE LEASES:</u>	<u>1189.84</u>	

\*\* 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)**

<u>PARCEL</u>	<u>ACREAGE</u>	<u>LEGAL DESCRIPTION</u>
1) <u>FEDERAL LEASE SL-068754</u> (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) <u>FEDERAL LEASE UTU-78562</u>	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) <u>STATE LEASE ML 47711</u>	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) <u>STATE LEASE ML 49287</u>	881.10	T 14 S, R 13 E
		Section 3: Lots 1, 2 and 3, S2N2, S2
		Section 10: W2NW, SW, SWSE
5) <u>STATE LEASE ML 51744</u>	212.5	T 13 S, R 13 E
		Section 36: SW, SWNWSWNW, S2S2NW, S2SWNE, W2SE, SESE, S2NESE, NWNESE
6) <u>PENTA CREEK FEE LEASE</u>	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) <u>PENTA CREEK LEASE EXTENSION</u> (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) <u>PUMPING STATION</u> (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)**

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

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

T14S, R13E	Section 10:	SENWNW
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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:

	<u>Begin</u>	<u>Complete</u>
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
		<hr/>
		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

Serial No. UTU-78562

**MODIFIED COAL LEASE**

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, S $\frac{1}{2}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$ ;

T. 14 S., R. 13 E., SLM, Utah  
Sec. 1, lots 2-7, SW $\frac{1}{4}$ NE $\frac{1}{4}$ , S $\frac{1}{2}$ NW $\frac{1}{4}$ ,  
W $\frac{1}{2}$ SE $\frac{1}{4}$ , SW $\frac{1}{4}$ ,

Sec. 12, lots 1-4, S $\frac{1}{2}$ N $\frac{1}{2}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$ ;  
Sec. 13, NE $\frac{1}{4}$ NE $\frac{1}{4}$ ;

T. 14 S., R. 14 E., SLM, Utah  
Sec. 6, lot 6;  
Sec. 7, lots 3 and 4;  
Sec. 18, lot 1, E $\frac{1}{2}$ NW $\frac{1}{4}$ .

Tract 2:

T. 13 S., R 13 E., SLM, Utah  
Sec. 34, NE $\frac{1}{4}$ SE $\frac{1}{4}$ , S $\frac{1}{2}$ SE $\frac{1}{4}$ ;  
Sec. 35, N $\frac{1}{2}$ , N $\frac{1}{2}$ SW $\frac{1}{4}$ ;

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

T. 14 S., R. 14 E., SLM, Utah  
Sec. 6, NE $\frac{1}{4}$ SW $\frac{1}{4}$ .

Tract 3:

T. 13 S., R. 14 E., SLM, Utah  
Sec. 31, lot 4, S $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ ,  
SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ ,

T. 14 S., R. 14 E., SLM, Utah  
Sec. 5, lot 4, W $\frac{1}{2}$ W $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ ,  
SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ , W $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ ,

S $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ , S $\frac{1}{2}$ S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ ;

W $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ ;

Sec. 6, NE $\frac{1}{4}$ SE $\frac{1}{4}$ ;

Sec. 8, W $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , W $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ ,  
SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ ,  
W $\frac{1}{2}$ E $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ , W $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ ,  
SW $\frac{1}{4}$ SW $\frac{1}{4}$ ;

Sec. 17, N $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ .

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. Lessee's 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 emergencies; 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)

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 - INTEREST -** Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure 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

Daniel W. Hills  
(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 of this act and are subject to compliance with Office of Surface Mining regulations, or as applicable the Utah program approved under the cooperative agreement 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.

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 7.....REPLACEMENT PAGES

**TABLE OF CONTENTS- APPENDICES**  
**R645-301-700 CHAPTER 7**

<b>APPENDIX NUMBER</b>	<b>DESCRIPTION</b>
APPENDIX 7-1	Investigation of Surface-Water and Groundwater Systems in the West Ridge Area, Carbon County, Utah
APPENDIX 7-1A	Investing of surface-Water and Groundwater Systems in the Whitmore LBA Area, Carbon County, Utah
APPENDIX 7-2	Baseline Ground Water Monitoring & Analyses
APPENDIX 7-3	Baseline Surface Water Monitoring & Analyses
APPENDIX 7-4	West Ridge Mine Sedimentation and Drainage Control Plan
APPENDIX 7-5	Water Rights Summary
APPENDIX 7-6	1985 & 1986 Seep and Spring Inventory Data
APPENDIX 7-6A	1999 & 2010 Seep and Spring Survey Data
APPENDIX 7-6B	2011 Seep and Spring Survey Data
APPENDIX 7-7	West Ridge Mine Estimated Water Usage
APPENDIX 7-8	Creamer and Noble Engineers C Canyon Road Station 406+70 - Culvert Design
APPENDIX 7-9	Letter from Division of Water Rights
APPENDIX 7-10	UPDES General Permit For Coal Mining
APPENDIX 7-11	Bear Canyon GVH Hydrology Report
APPENDIX 7-12	Bear Canyon Drainage Control Plan
APPENDIX 7-13	WR-2 Subsidence Information
APPENDIX 7-14	Grassy Trail Reservoir - Right Fork Historical Flow Data

## **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 Sunnyside City. Sunnyside 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, Personal 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 7-6A

(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.

**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.

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 panel 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 rather 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 species. 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 foot 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 in detail 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 2,700 feet of

bedrock cover. The depth of cover overlying longwall Panel 22 will range from about 2,800 to 3,600 feet, which will make the West Ridge Mine the deepest coal mining 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.

There will be no longwall mining beneath the Right Fork of Whitmore Canyon Creek. The only mining under the Right Fork will be the 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 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 (on the order of a few inches or less). Because of the very large depth of cover in proposed mining areas, 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.

It is illustrative to compare the recommended minimum overburden thicknesses 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. 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 3,600 feet, it is calculated that the overburden thickness present above Panel 22 is 4.6 to 6.0 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 2,700 feet, it is calculated that the overburden thickness there is 4.5 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.

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).

Groundwater discharging from the mine roof from an overlying 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.

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, Iclander 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 springs 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 (2,800 to 3,600 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. 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 (3<sup>rd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 version 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 3<sup>rd</sup> Quarter of 2010. This site is located

on the right fork of Whitmore Canyon above Grassy Trail Reservoir. In 2<sup>nd</sup> Quarter of 2011, this site will be replaced 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 primary 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 2<sup>nd</sup> 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 channel 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 Starting 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 9<sup>th</sup> 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.

### 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 continuous 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 continuous 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 continuous 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 continuous 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.

~~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 continuous 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 continuous measuring/recording devices at each flume.*
- 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
<b>Streams</b>			
RST-1 <sup>(1)</sup>	Flow, Field, Lab Analysis	Quarterly	Right Fork - Grassy Trail
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 <sup>(2)</sup>	Flow, Field, Lab Analysis	Quarterly	Grassy Trail Creek
ST-10 <sup>(3)</sup>	Flow, Field, Lab Analysis	Annual - 3 <sup>rd</sup> Quarter	Grassy Trail Creek
ST-15	Flow, Field, Lab Analysis	Quarterly	Spring Canyon Stream
Patterfore	Flow, Field, Lab Analysis	*Quarterly	Right Fork of Grassy Trail Reservoir
<b>Flumes</b>			
LF-1	Flow, Field, Lab Analysis	*Quarterly	Left Fork of Grassy Trail Reservoir
LF-2	Flow, Field, Lab Analysis	*Quarterly	Left Fork of Grassy Trail Reservoir
RF-1	Flow, Field, Lab Analysis	*Quarterly	Right Fork of Grassy Trail Reservoir
RF-2	Flow, Field, Lab Analysis	*Quarterly	Right Fork of Grassy Trail Reservoir
<b>Springs</b>			
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
<b>Wells</b>			
DH86-2	Water Level, Field, Lab	Quarterly	Sunnyside Sandstone in C Canyon
<b>Underground</b>			
UG-1	Field, Lab Analysis	Monthly	West Ridge Mine

\* Flows are continually monitored and will be downloaded quarterly.

(1) RF-1 will replace RST-1 after flume is installed.

(2) LF-1 will replace ST-9 after flume is installed.

(3) LF-2 will replace ST-10 after flume is installed.

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.

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

APPENDIX 7-6B

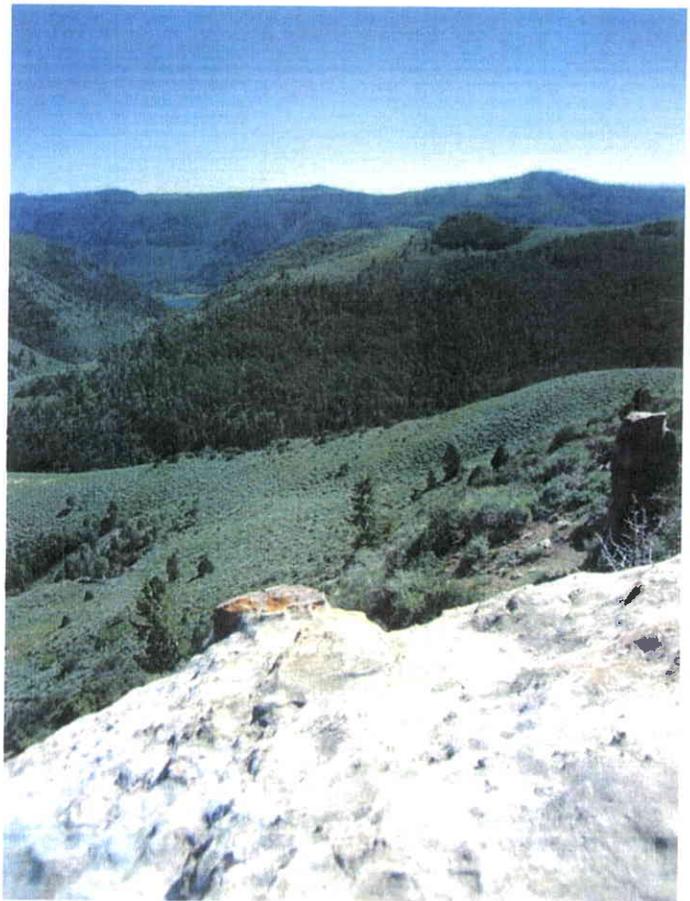
2011 SPRING & SEEP DATA

**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

2695 N. 600 E.  
LEHI, UTAH 84043  
(801) 766-4006  
[PETERSEN@RELIA.NET](mailto: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*

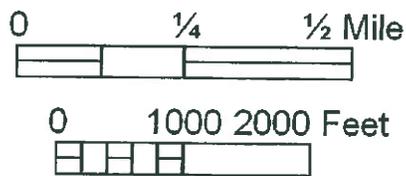
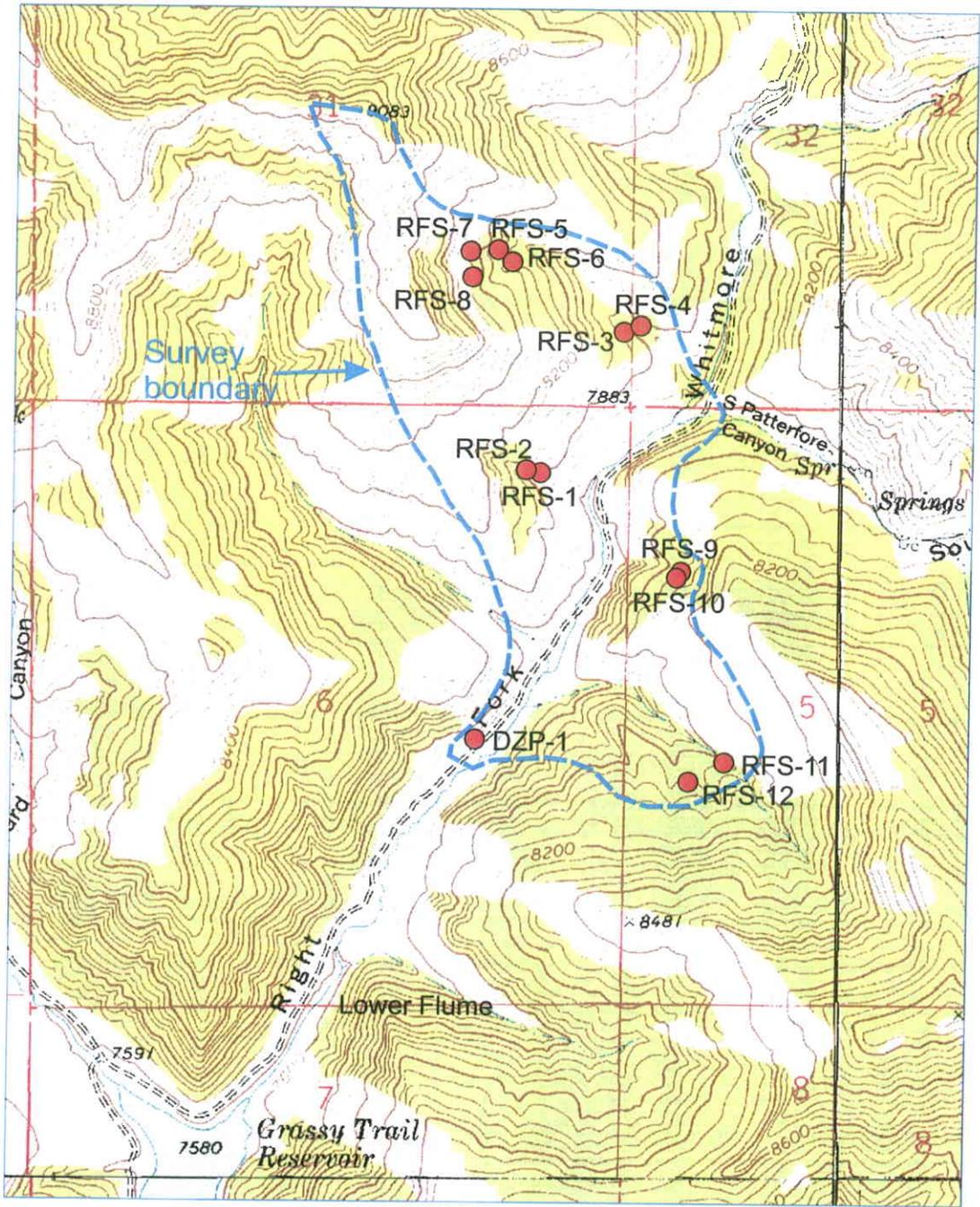
Specific conductance measurements were performed using an Extech brand model EC400 conductivity meter with automatic temperature compensation. The instrument was regularly calibrated using NIST traceable conductivity standard solutions.

*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.



● Spring or seep location

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 23-Jun-11	552670 4387288	0.44 1.44	13.5 7.9	7.44 7.80	764 752	Colton Formation	wildlife, no development

Note: The 2011 spring and seep information was collected during a very wet climatic cycle with a late-season snow melt-off. Heavy soaking rains had also occurred in the few days previous to the survey.

**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

**CONFIDENTIAL INFORMATION**

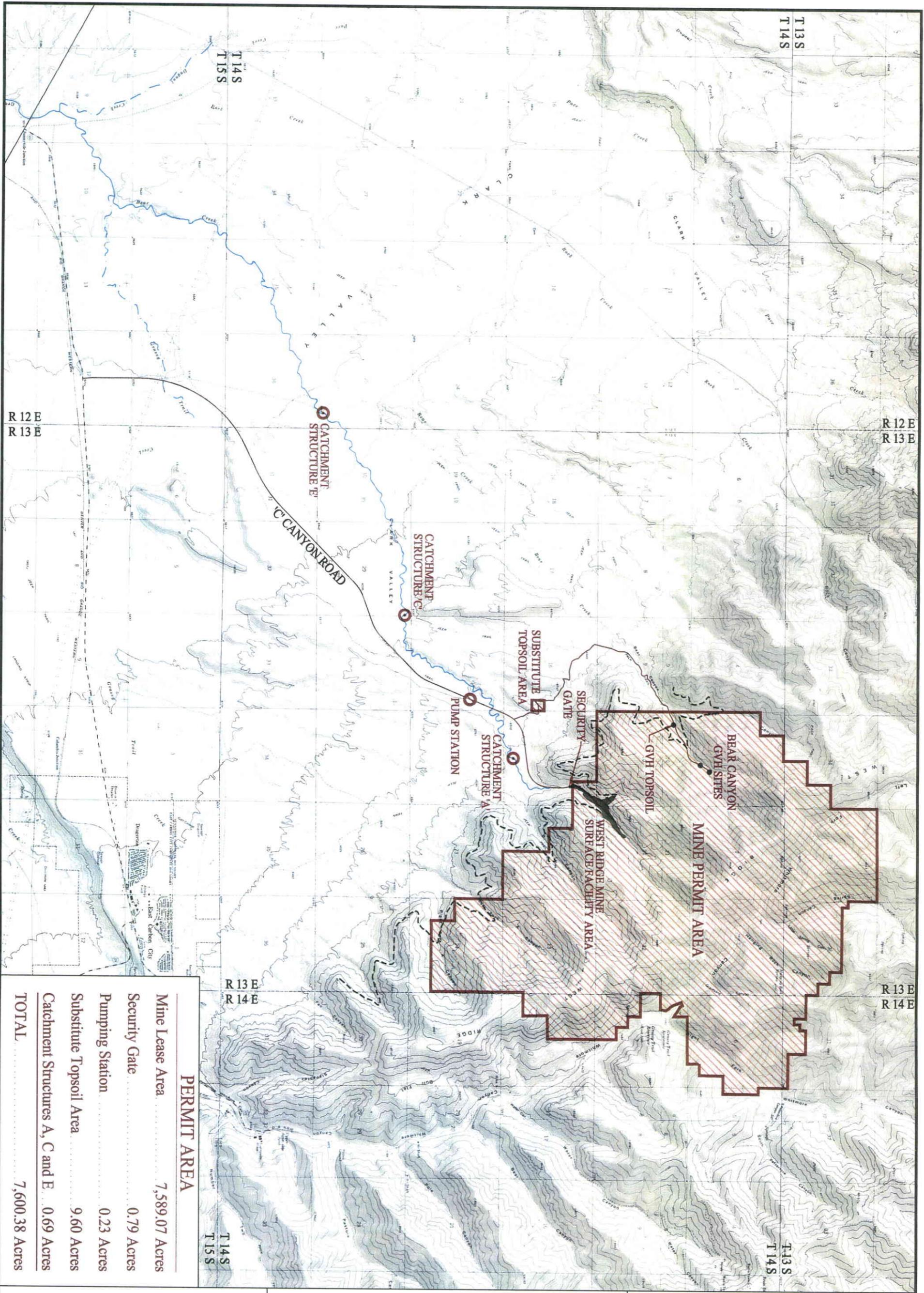
**NOTE TO REVIEWERS:**

**THE FOLLOWING INFORMATION IS INCLUDED IN  
THE CONFIDENTIAL BINDER:**

- 1) ARCHEOLOGICAL INFORMATION FROM  
SENCO-PHENIX ARCHEOLOGICAL  
CONSULTANTS**
  
- 2) 2011 RAPTOR SURVEY INFORMATION FROM  
EIS ENVIRONMENTAL CONSULTANTS**

**THIS SAME INFORMATION HAS BEEN  
SUBMITTED AND APPROVED PREVIOUSLY FOR  
OTHER AMENDMENTS, BUT IS BEING  
SUBMITTED AGAIN FOR EASE OF REVIEW**

MAPS



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
<b>TOTAL</b>	<b>7,600.38 Acres</b>

**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

**LEGEND:**

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



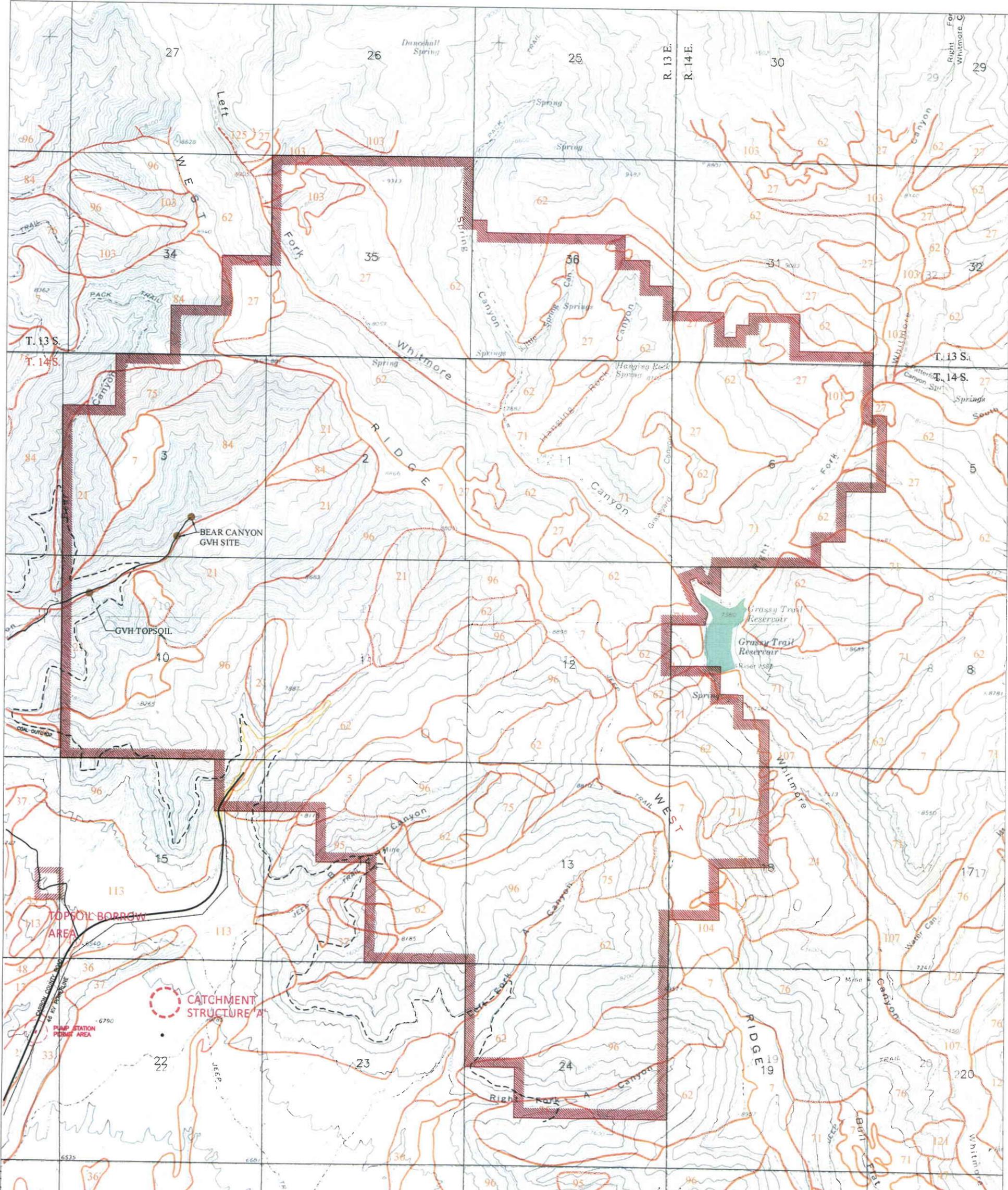
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

**WEST RIDGE RESOURCES, INC.**

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**SOIL MAP UNITS**

5 Beje complex	75 Perma family, 15 to 40 percent slopes
7 Beje-Trag complex	76 Perma family-Datno complex
21 Croston loam, 8 to 30 percent slopes	84 Podz-Rock outcrop complex
24 Datno Variant very stony loam, 50 to 80 percent slopes	95 Rock outcrop
27 Dones-Tope families complex	96 Rock outcrop-Rubbland-Travertine complex
33 Gerst-Badland-Rubbland complex, 15 to 50 percent slopes	100 Senesch loam, 3 to 15 percent slopes
36 Gerst-Strech-Badland complex, 3 to 50 percent slopes	103 Senesch-Tava family complex
37 Gerst-Strech-Badland complex, 50 to 70 percent slopes	104 Senesch family, 3 to 15 percent slopes
48 Havardal loam, 1 to 8 percent slopes	107 Shapert-Wincen complex
49 Havardal loam, alkali, 0 to 2 percent slopes	113 Strech very stony loam, 3 to 15 percent slopes
52 Hernandez family, 3 to 8 percent slopes	125 Uinta-Tope families complex
62 Madford family-Commodore complex	
71 Palhead extremely bouldery fine sand loam, 40 to 70 percent slopes	

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.

**DAVID W. HILBIS**  
 #6449561  
 REGISTERED PROFESSIONAL ENGINEER

**WEST RIDGE MINE**  
 Map 2-1  
 Regional Soil Map

ATE: 7-06-11    REV: 23    ACAD REF: MAP2-1 REGSOIL REV23

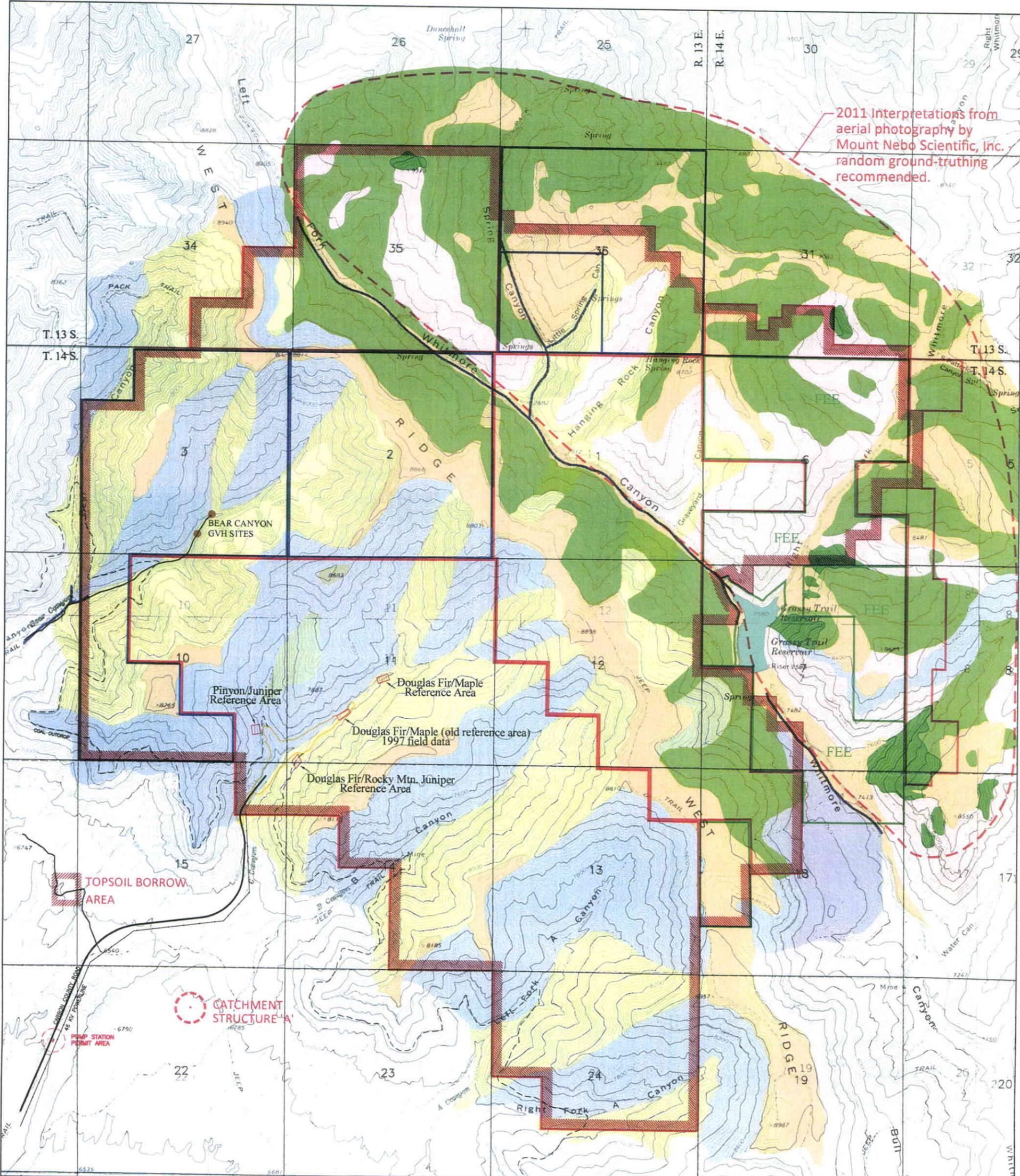
**LEGEND:**

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Soil Mapping Boundary
- Soil Map Number

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SCALE: 1"=2500'

**WEST RIDGE RESOURCES, INC.**

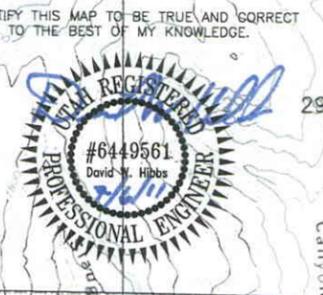


**VEGETATION COMMUNITIES**

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.

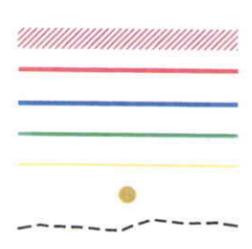
Catchment Structures C and E (Permit Areas)  
 Catchment Structure C: Pinyon/Juniper  
 Catchment Structure E: Sagebrush  
 See Appendix 5-15; Attachment 11



**WEST RIDGE MINE**  
**Map 3-1**  
**General Vegetation**  
**Communities**

DATE: 7-06-11    REV: 27    ACAD REF: MAP3-1 GENVEG REV27

**LEGEND:**  
 Permit Boundary  
 Federal Lease  
 State Lease  
 Penta Creek Fee  
 Surface Facility Area  
 GVH Site  
 Outcrop



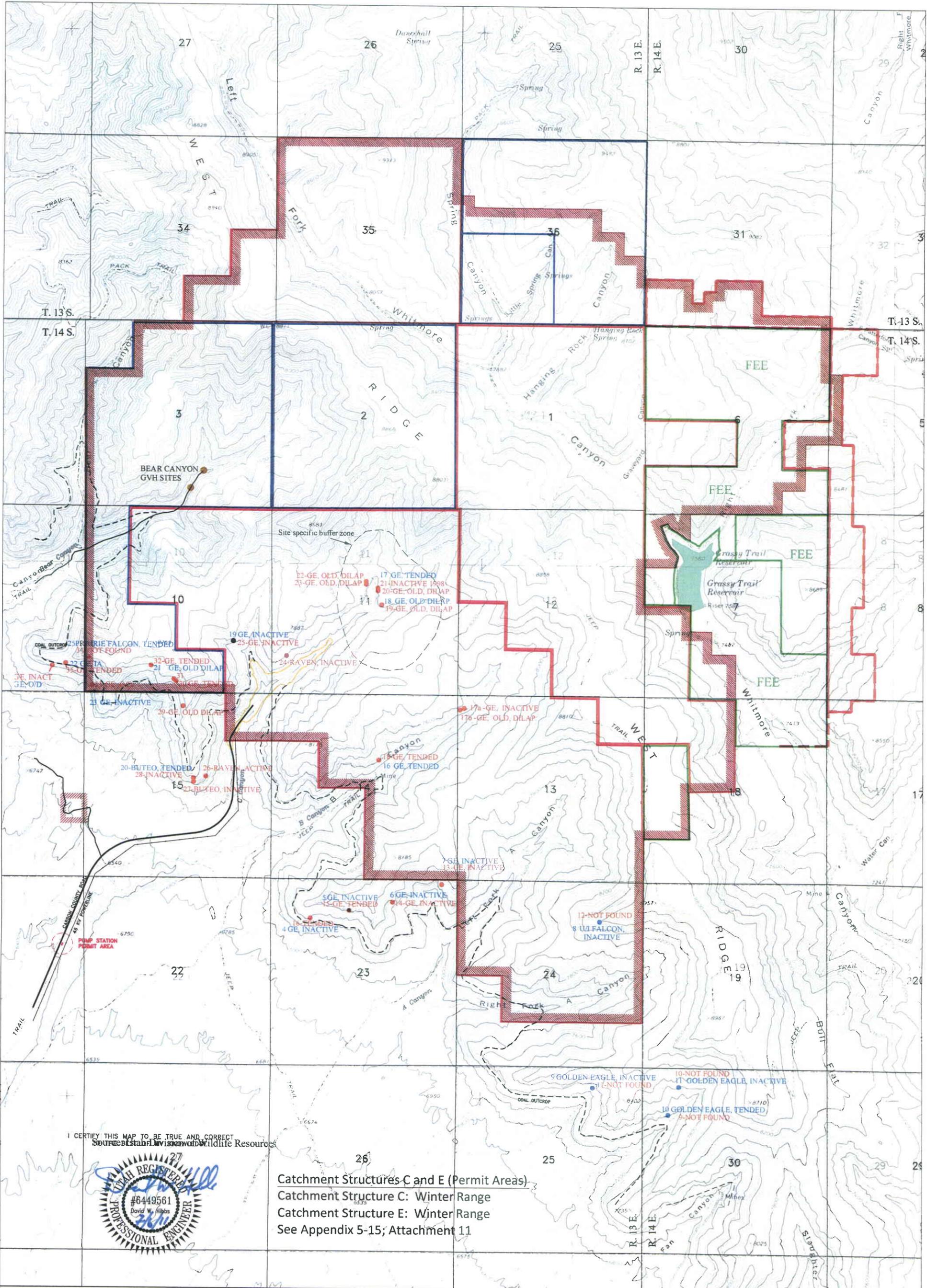
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**SCALE: 1"=2500'**

**DIV. OF OIL, GAS & MINING**



I CERTIFY THIS MAP TO BE TRUE AND CORRECT  
 SOURCE: Bureau of Land Management, Division of Wildlife Resources



Catchment Structures C and E (Permit Areas)  
 Catchment Structure C: Winter Range  
 Catchment Structure E: Winter Range  
 See Appendix 5-15; Attachment 11

**WEST RIDGE MINE**  
**Map 3-4A**  
**Wildlife Map - Raptor Survey**

ATE: 7-06-11 REV: 22 ACAD REF: MAP3-4A RAPTOR REV22

**LEGEND:**

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop
- Raptor Nest - 1997 Survey
- Raptor Nest - 1998 Survey

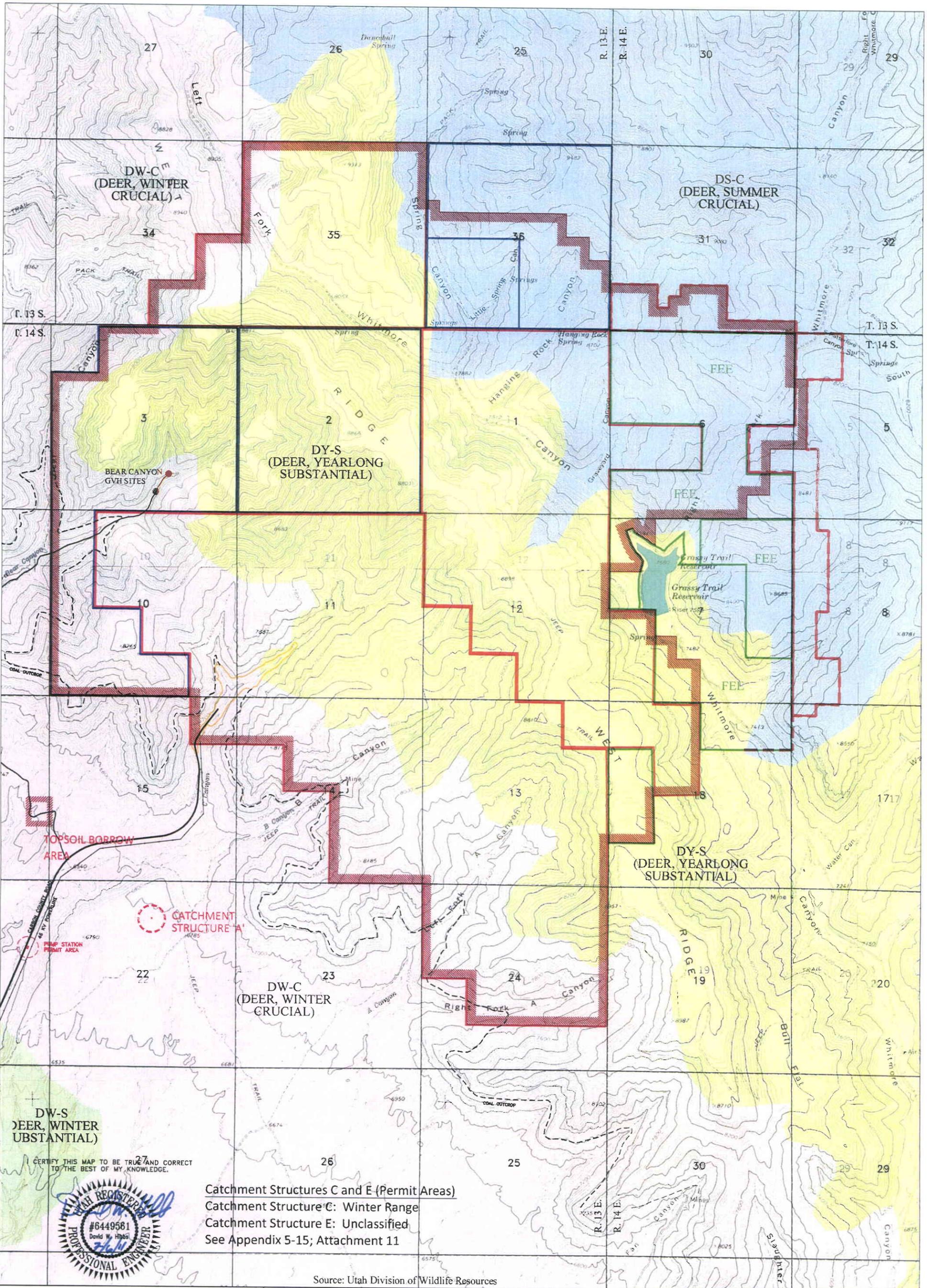
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**AUG 09 2011**

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DIV. OF OIL, GAS & MINING



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

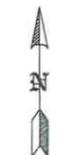
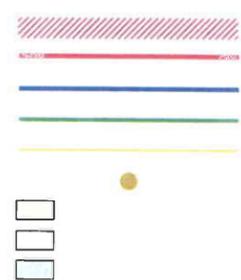
# WEST RIDGE MINE

## 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



**WEST RIDGE**  
RESOURCES, INC.

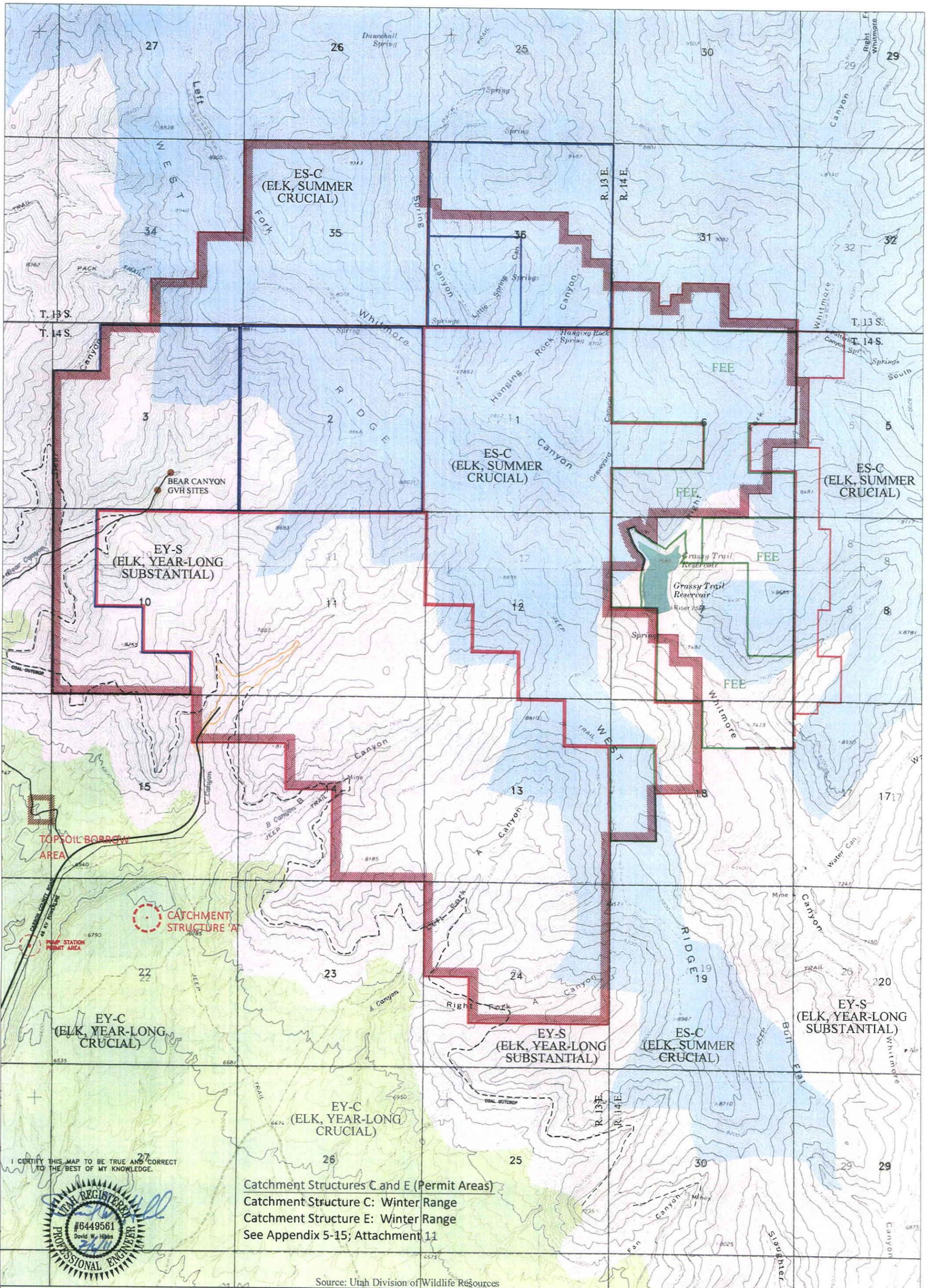
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AUG 09 2011

SCALE: 1"=2500'

DIV. OF OIL, GAS & MINING





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

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- GVH Site
- EY-C
- ES-C
- EY-S

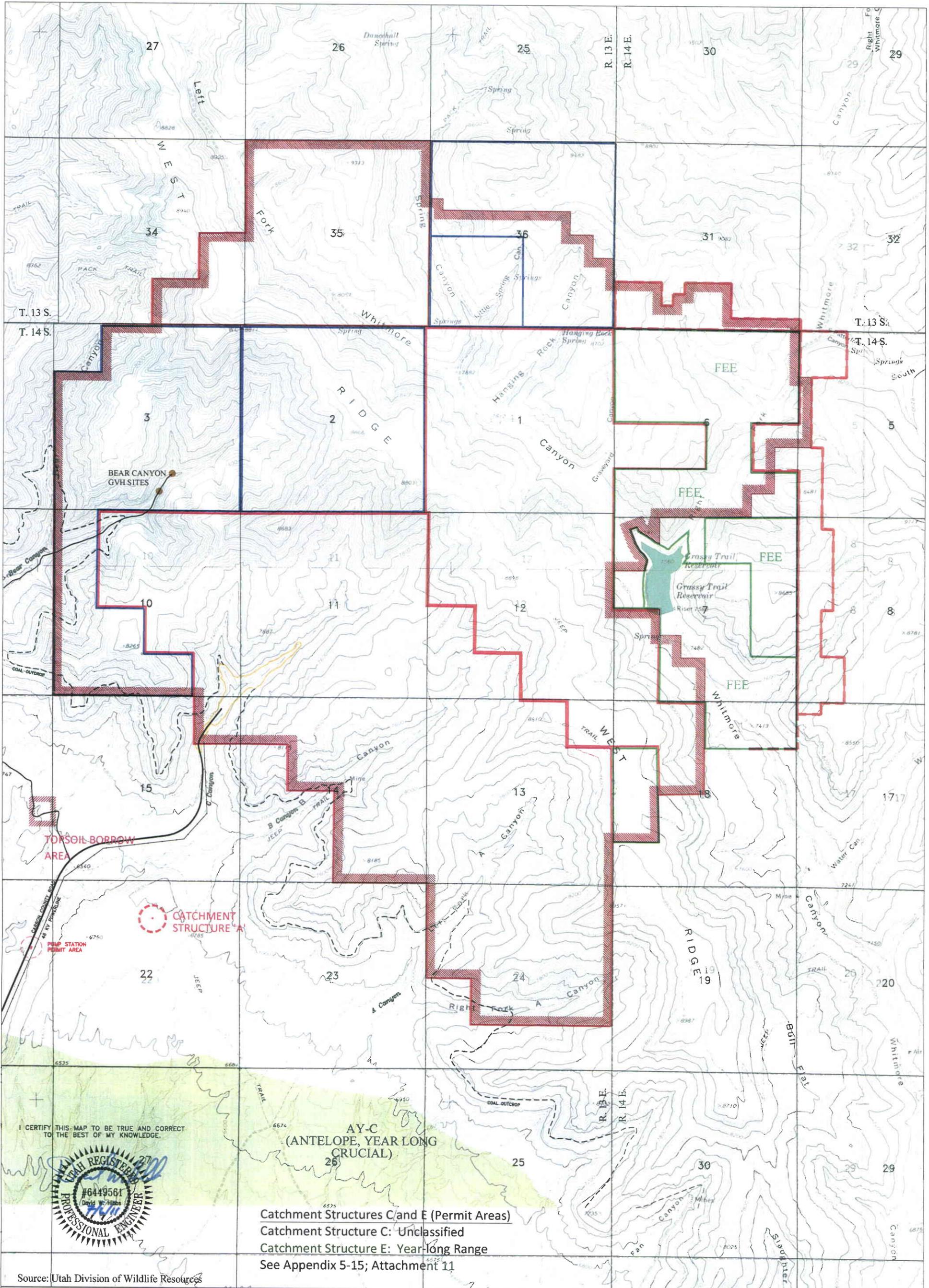


**WEST RIDGE**  
RESOURCES, INC.

RECEIVED  
AUG 9 2011

SCALE: 1"=2500'





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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



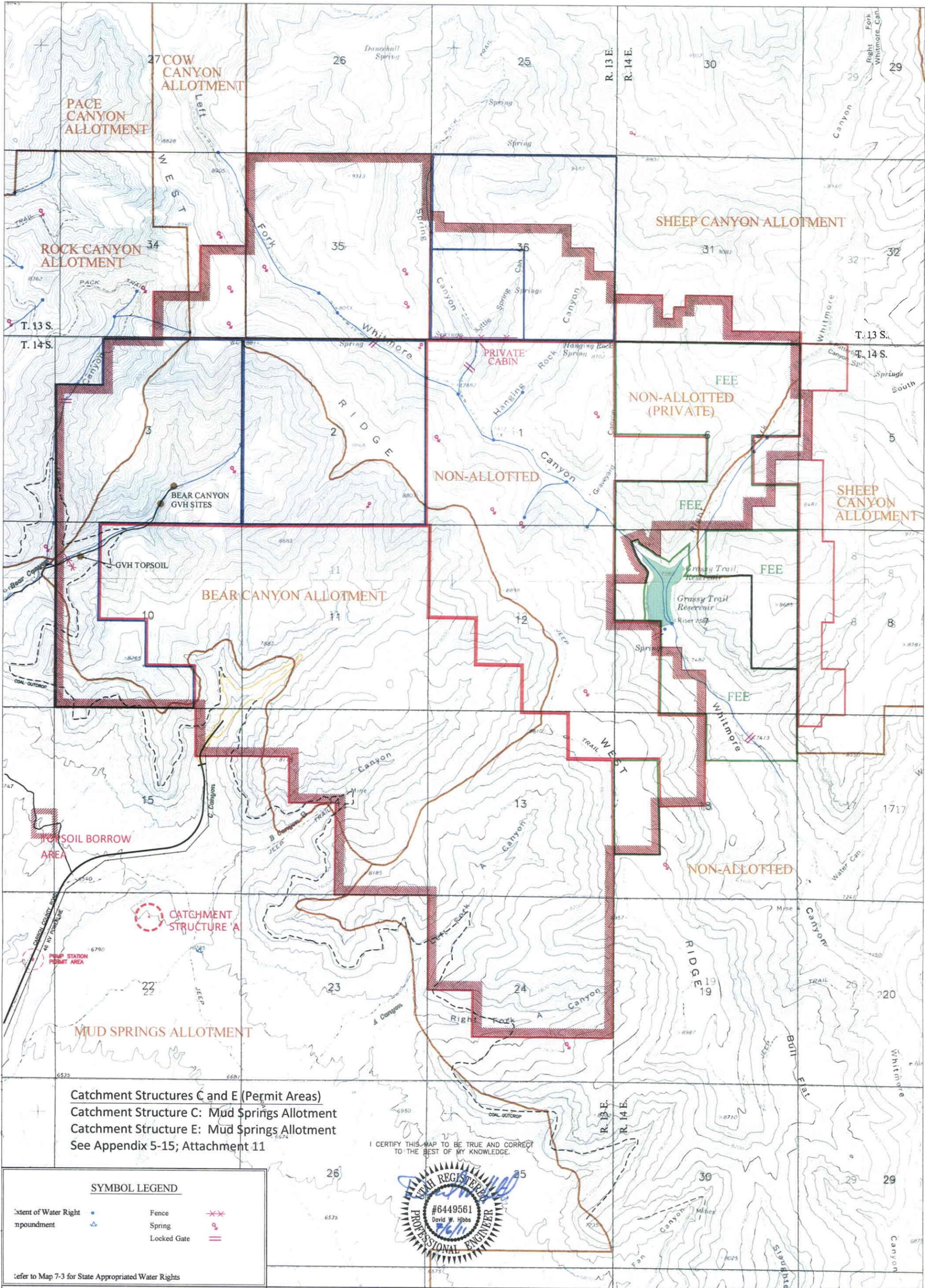
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Catchment Structures C and E (Permit Areas)  
 Catchment Structure C: Mud Springs Allotment  
 Catchment Structure E: Mud Springs Allotment  
 See Appendix 5-15; Attachment 11

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



**SYMBOL LEGEND**

- Extent of Water Right
- Impoundment
- Fence
- Spring
- Locked Gate
- XXXX
- ♀
- ==

Refer to Map 7-3 for State Appropriated Water Rights

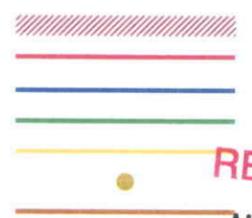
# WEST RIDGE MINE

## 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

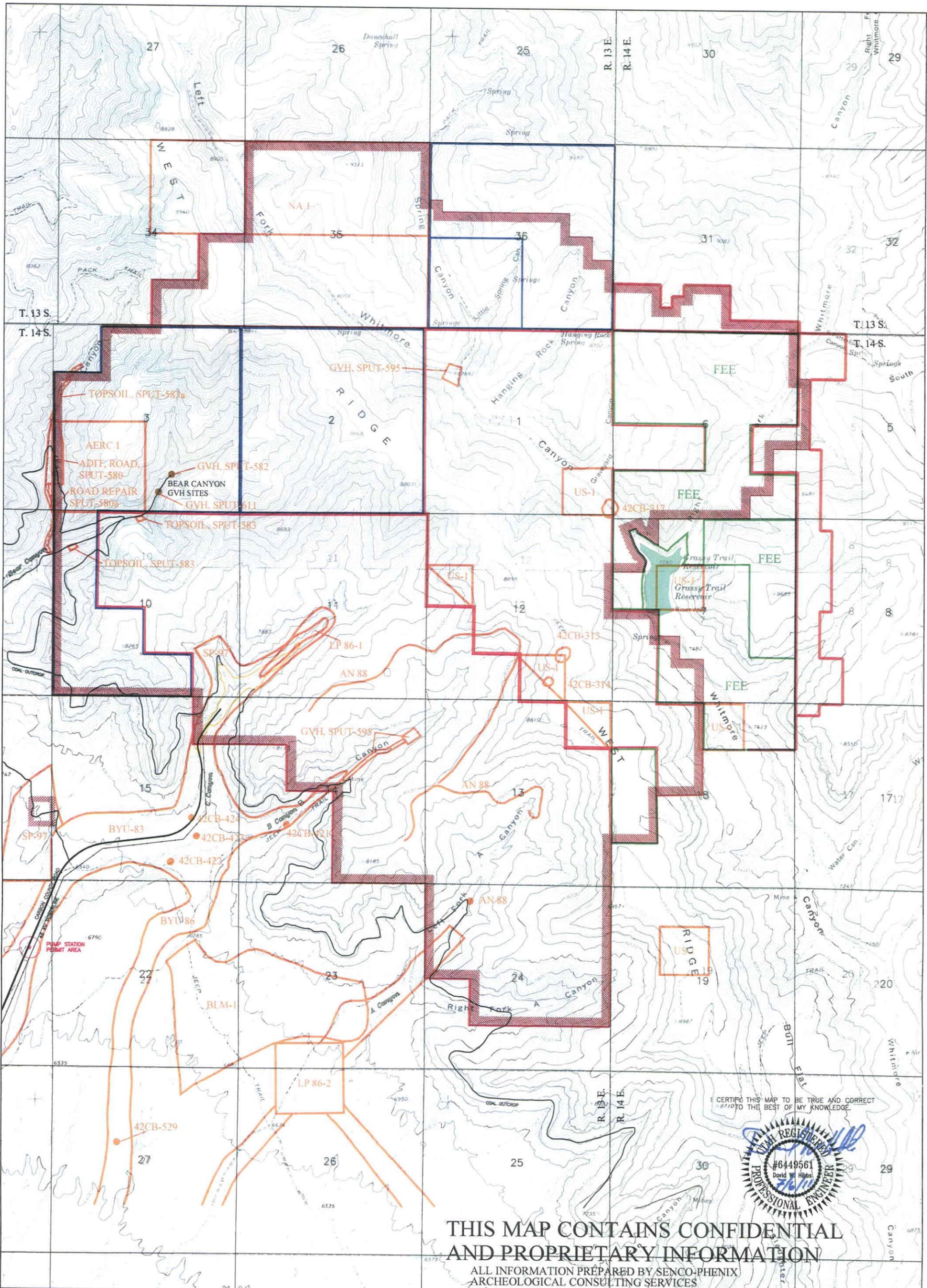


**WEST RIDGE**  
RESOURCES, INC.

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SCALE: 1"=2500'



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



**THIS MAP CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION**  
 ALL INFORMATION PREPARED BY SENCO-PHENIX ARCHEOLOGICAL CONSULTING SERVICES

**WEST RIDGE MINE**  
**Map 4-2**  
**Archeology Map**

**LEGEND:**

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- Survey Denotation
- Block Survey Boundary
- Linear Survey
- Archeological Site

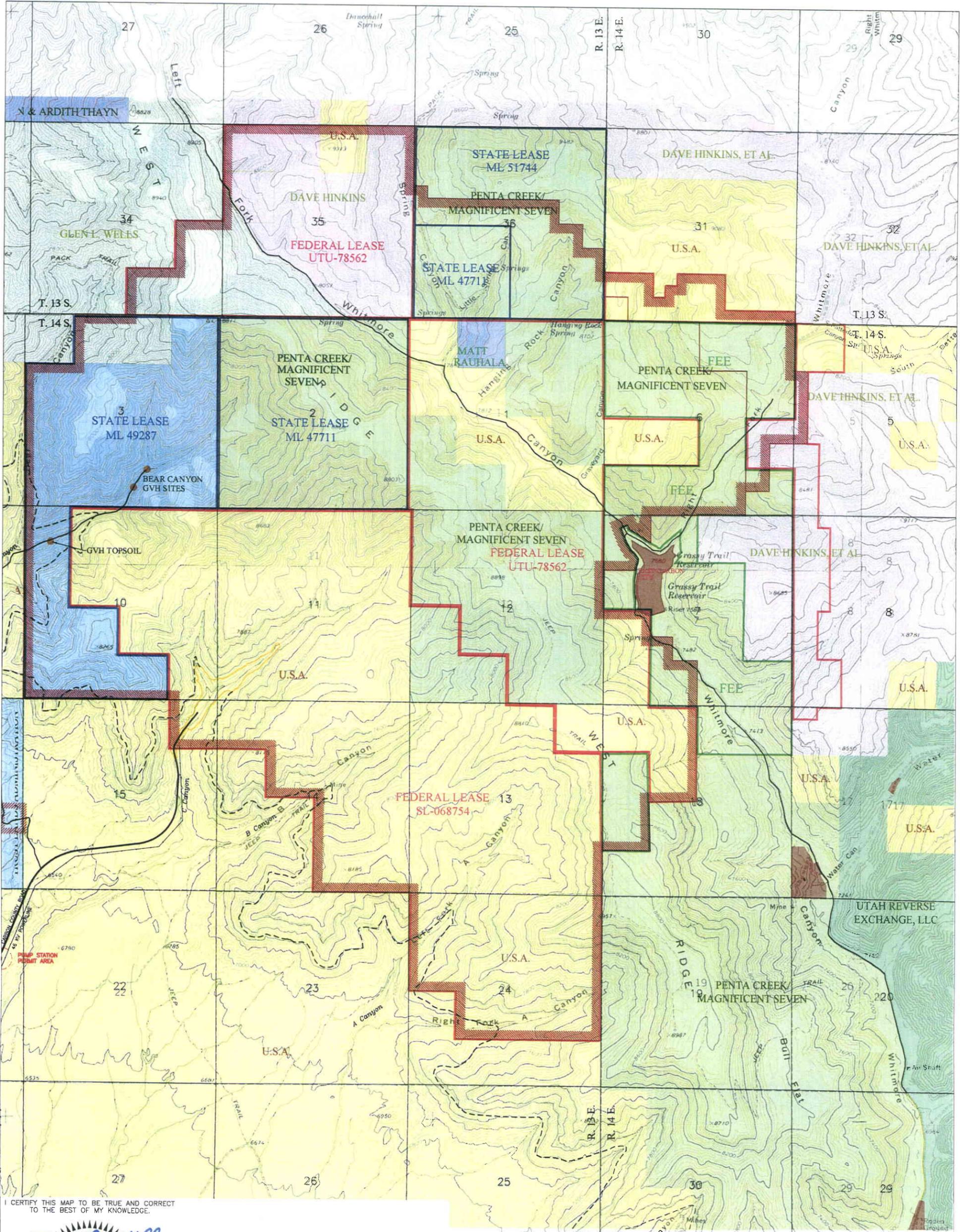
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**AUG 09 2011**  
 DIV. OF OIL, GAS & MINING

LP 86-2

42CB-422



SCALE: 1"=2500'



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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

RECEIVED  
 AUG 09 2011

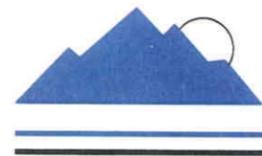
# WEST RIDGE MINE

## Map 5-2

### Surface Ownership Map

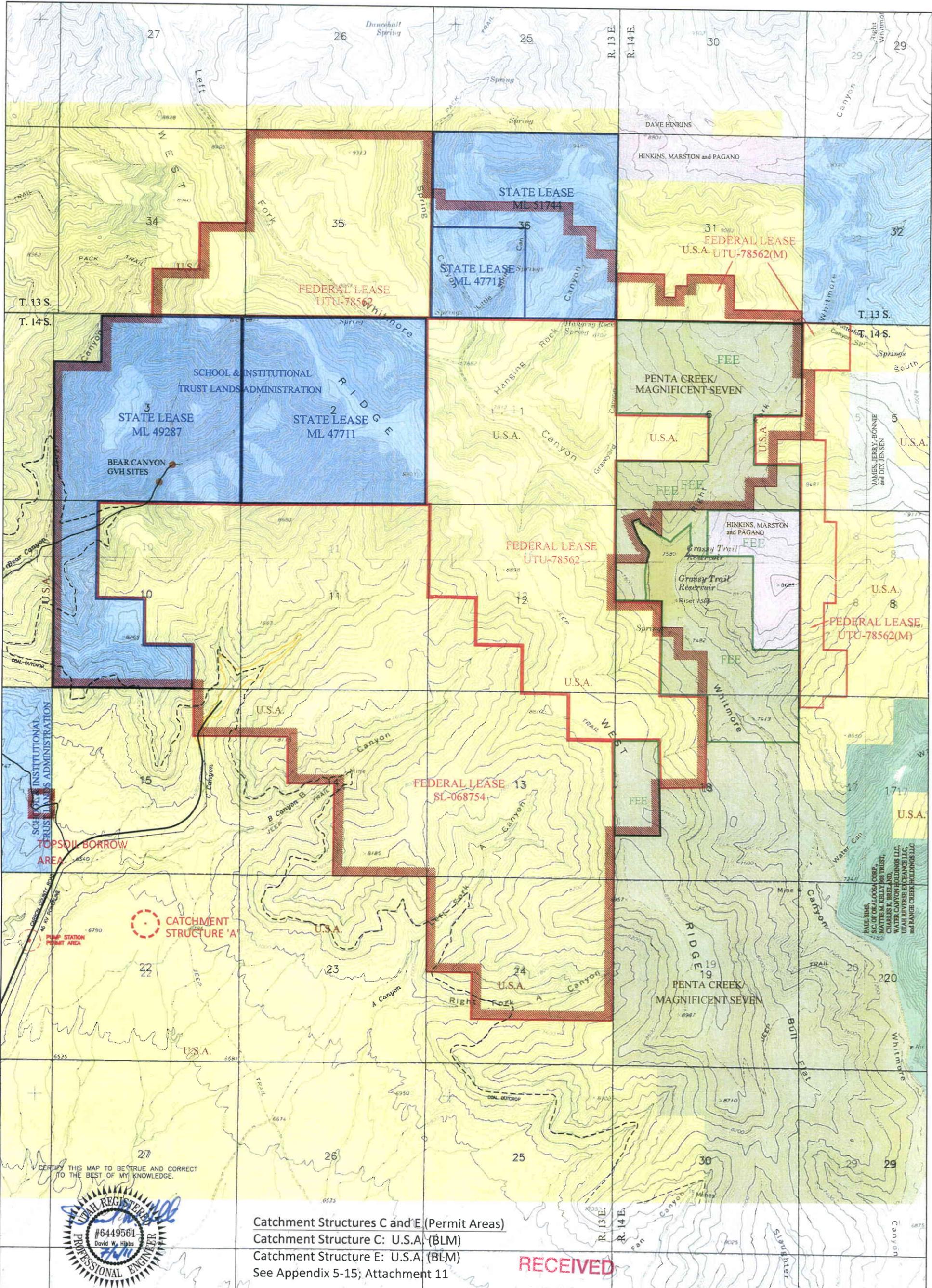
**LEGEND:**

- Permit Boundary
  - Federal Lease
  - State Lease
  - Penta Creek Fee
  - Surface Facility Area
  - GVH Site
  - Outcrop
- DIV. OF OIL, GAS & MINING**
  - School Trust Land (STLA)
  - 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



**WEST RIDGE**  
 RESOURCES, INC.

SCALE: 1"=2500'



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

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**AUG 09 2011**



# WEST RIDGE MINE

## Map 5-3

### Sub-surface Ownership Map

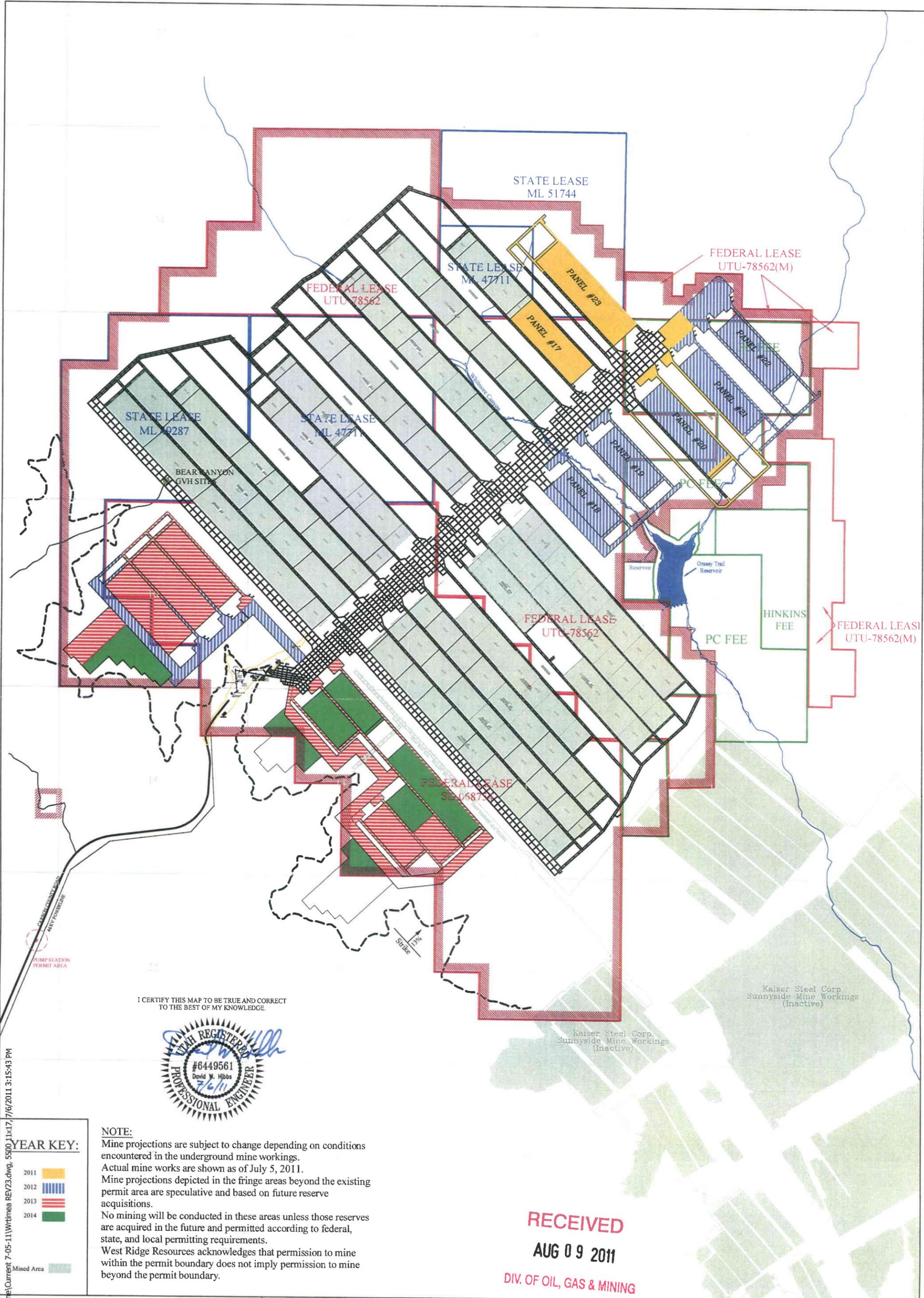
**LEGEND:**

Permit Boundary		School Trust Lands (SITLA)	
Federal Lease		Penta Creek/Magnificent Seven	
State Lease		U.S.A. (BLM)	
Penta Creek Fee		Dave Hinkins, et al.	
Surface Facility Area		East Carbon City	
GVH Site		James T. Jensen, et al.	
Outcrop		Paul Sims, et al.	

**DIV. OF OIL, GAS & MINING**

**WEST RIDGE RESOURCES, INC.**

SCALE: 1"=2500'



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



**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.

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G:\Current Drawings\MRP Maps\West Ridge Mine\Current 7-05-11\Wrtimea REV23.dwg, 5500, 11x17, 7/6/2011 3:15:43 PM

**YEAR KEY:**

2011	
2012	
2013	
2014	
Mined Area	

# WEST RIDGE MINE

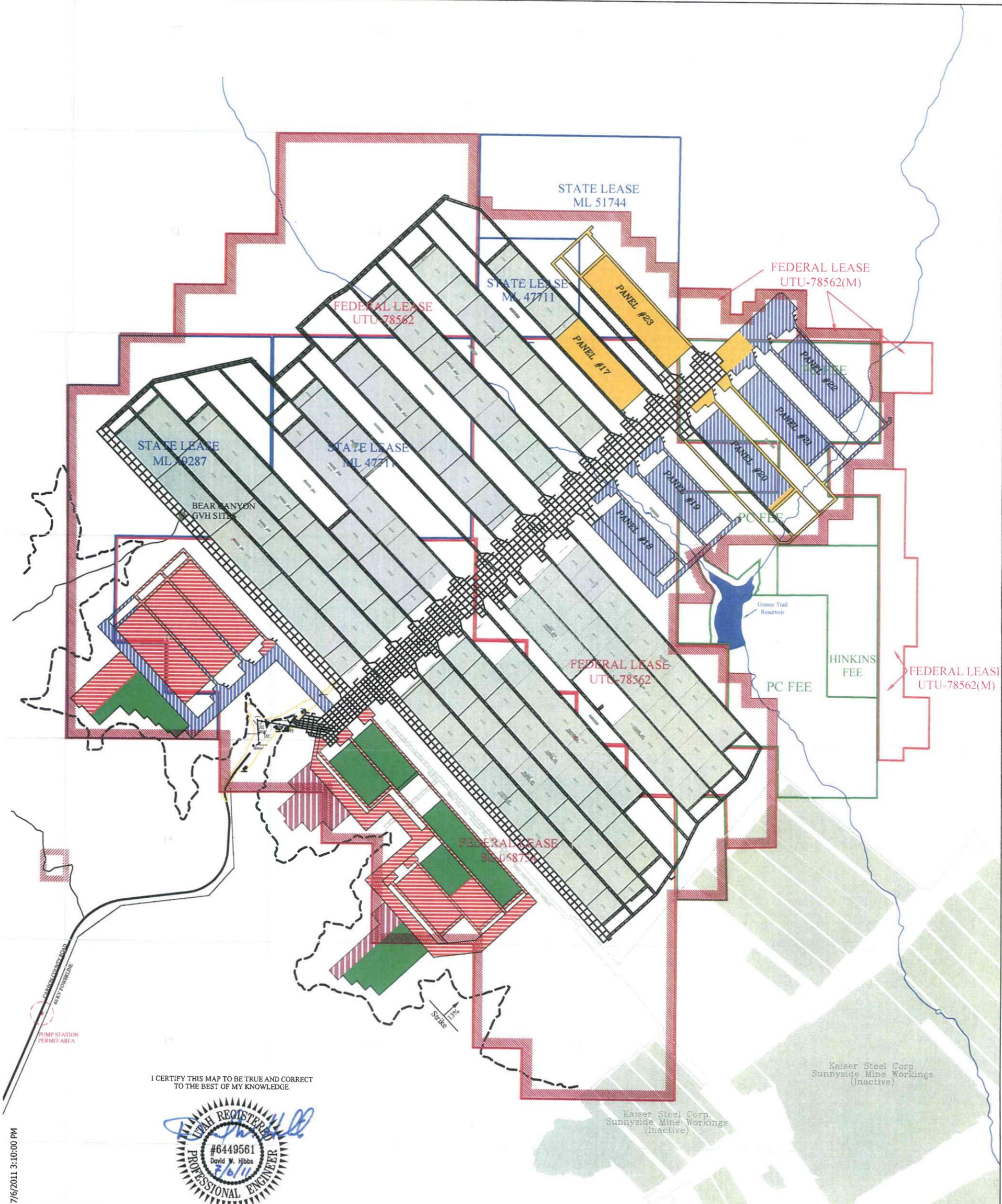
## Map 5-4A

### Mining Projections

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



SCALE: 1"=2500'



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



**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
- Permit Boundary

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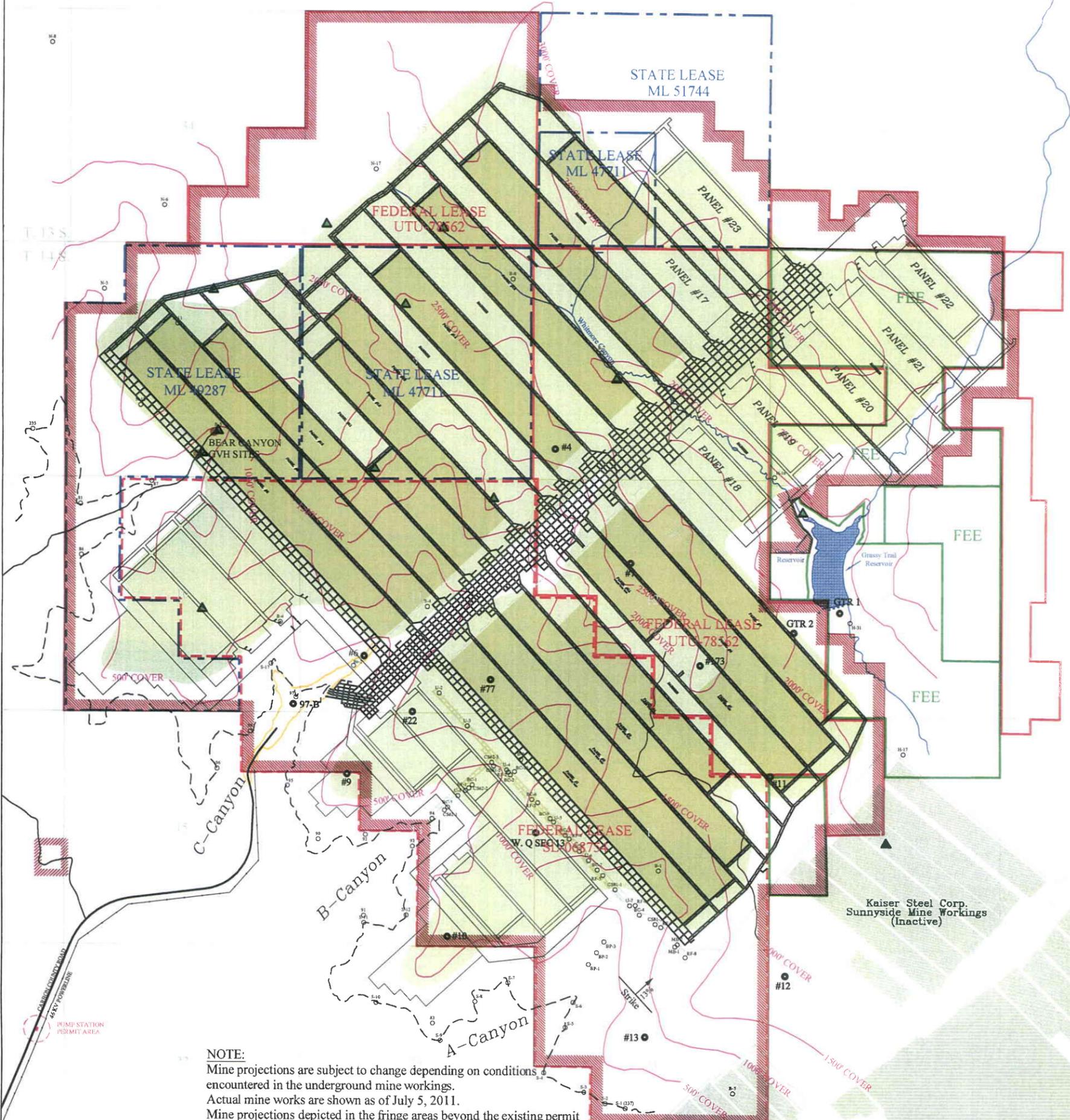
**WEST RIDGE MINE**  
**Map 5-4B**  
**Mining Projections**

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



**WEST RIDGE**  
 RESOURCES, INC.

SCALE: 1"=2500'



**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. 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.

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



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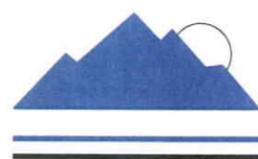
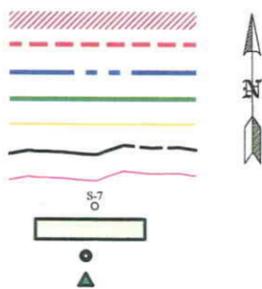
# WEST RIDGE MINE

## Map 5-7

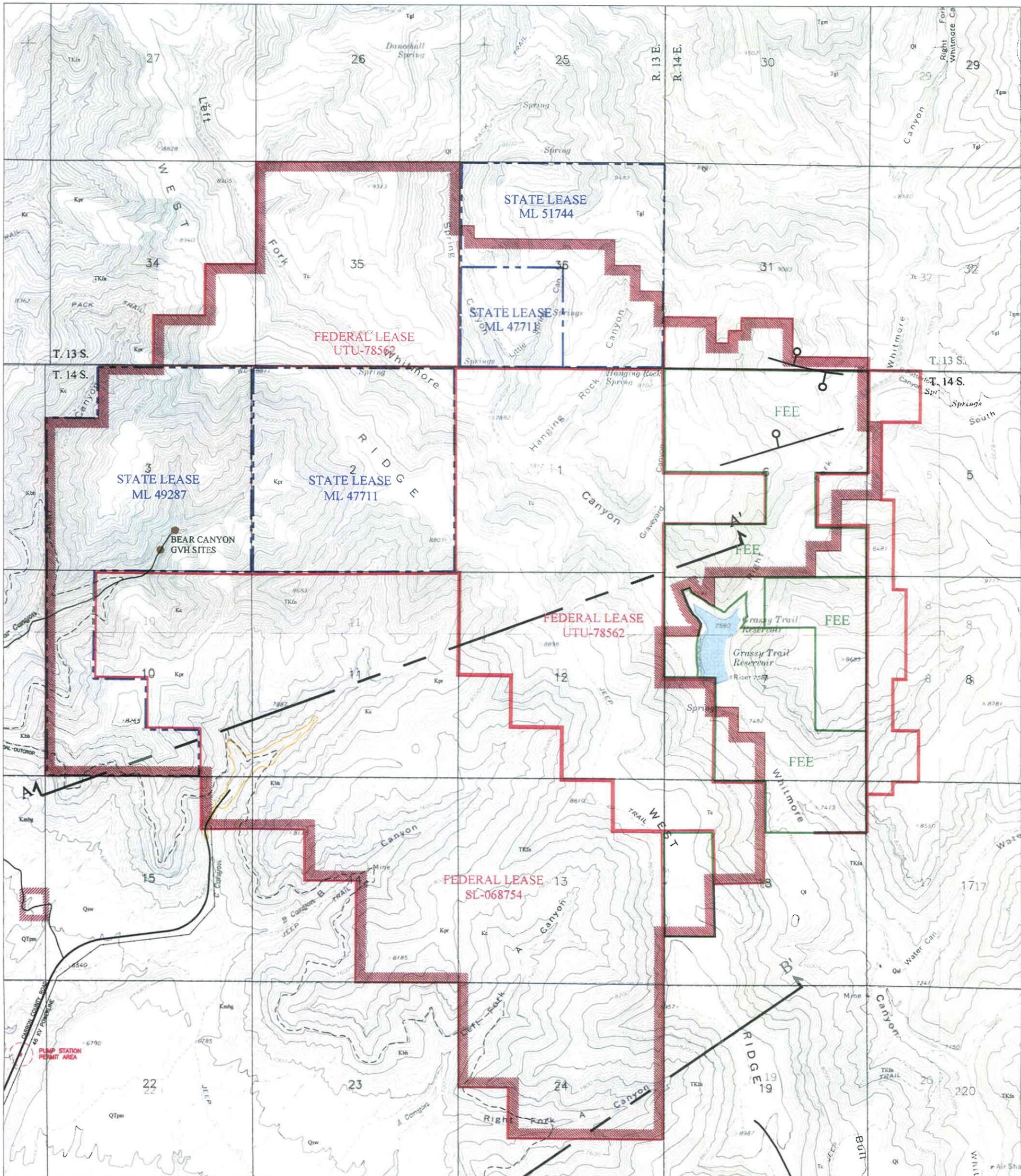
### Subsidence Map

**LEGEND:**

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- Outcrop
- Cover
- Drill Hole
- Possible Subsidence Area
- Existing Photogrammetric Control Points
- Future Photogrammetric Control Points



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**FORMATION LEGEND:**

Quaternary	Qd	Alluvium Undifferentiated	Tertiary and Cretaceous	TKln	Flagstaff Limestone and North Horn Formation
	Ql	Landslide Deposits		Kpr	Price River Formation
	Qsw	Slope-wash Deposits		Kc	Castlegate Sandstone
Tertiary and Miocene(?)	QTpm	Pediment Mantle	Cretaceous	Kbh	Blackhawk Formation
	Tgm	Middle Member		Kmbg	Main Body of the Blue Gate Member
Tertiary	Tgl	Lower Member			
	Tc	Colton Formation			

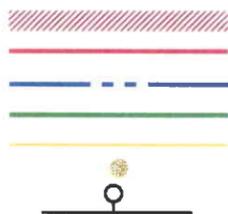
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



Refer to Map 6-1A for cross-section.

**WEST RIDGE MINE**  
**Map 6-1**  
**Regional Geology Map**

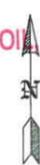
- LEGEND:**
- Permit Boundary
  - Federal Lease
  - State Lease
  - Penta Creek Fee
  - Surface Facility Area
  - GVH Site
  - Fault



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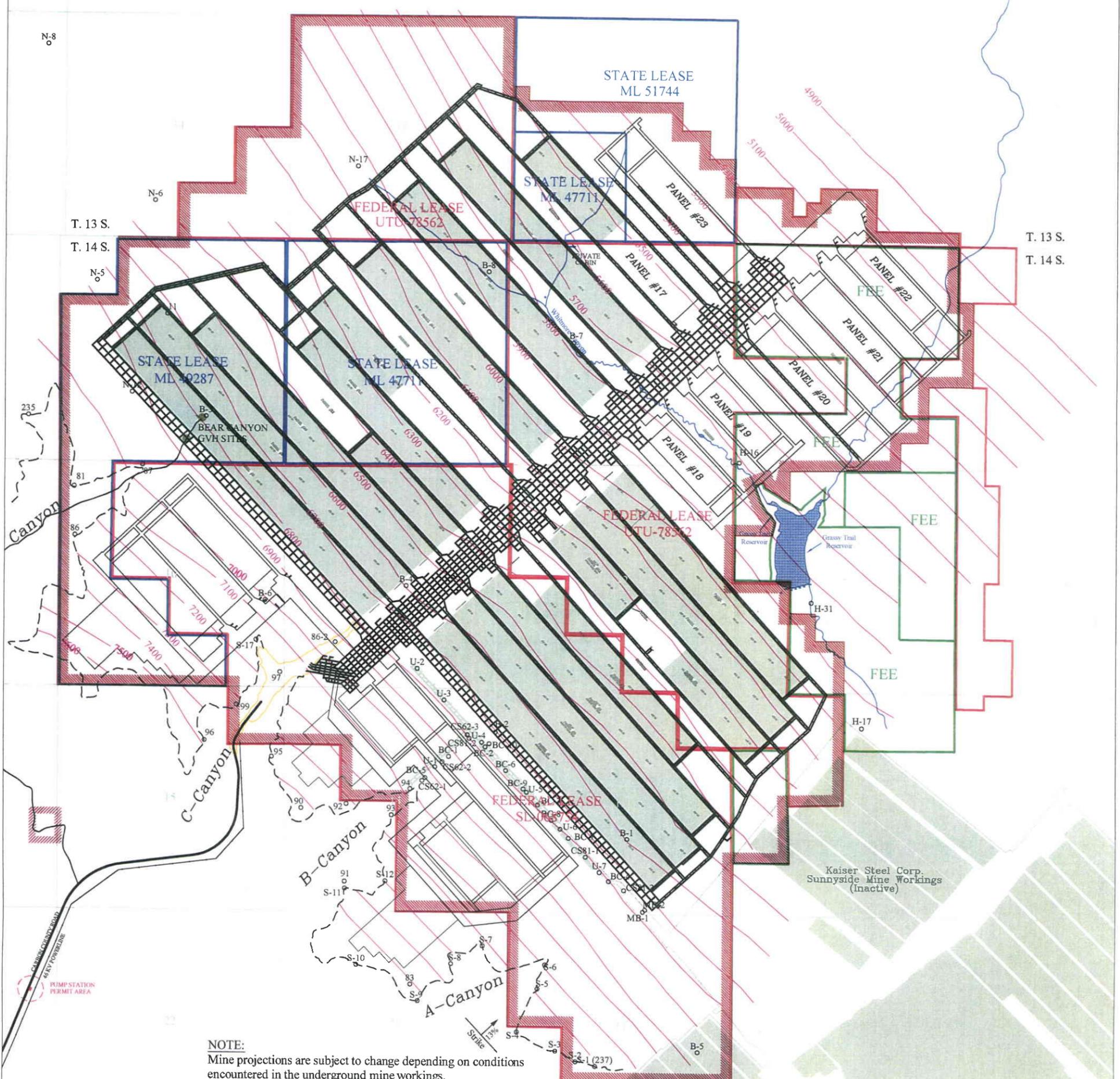
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**RESOURCES, INC.**

SCALE: 1"=2500'

R. 13 E.  
R. 14 E.



**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.

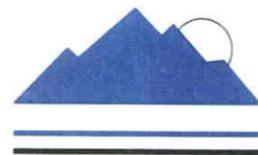
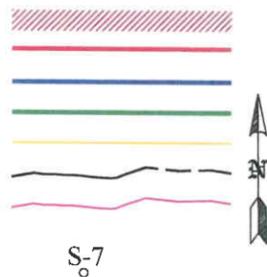
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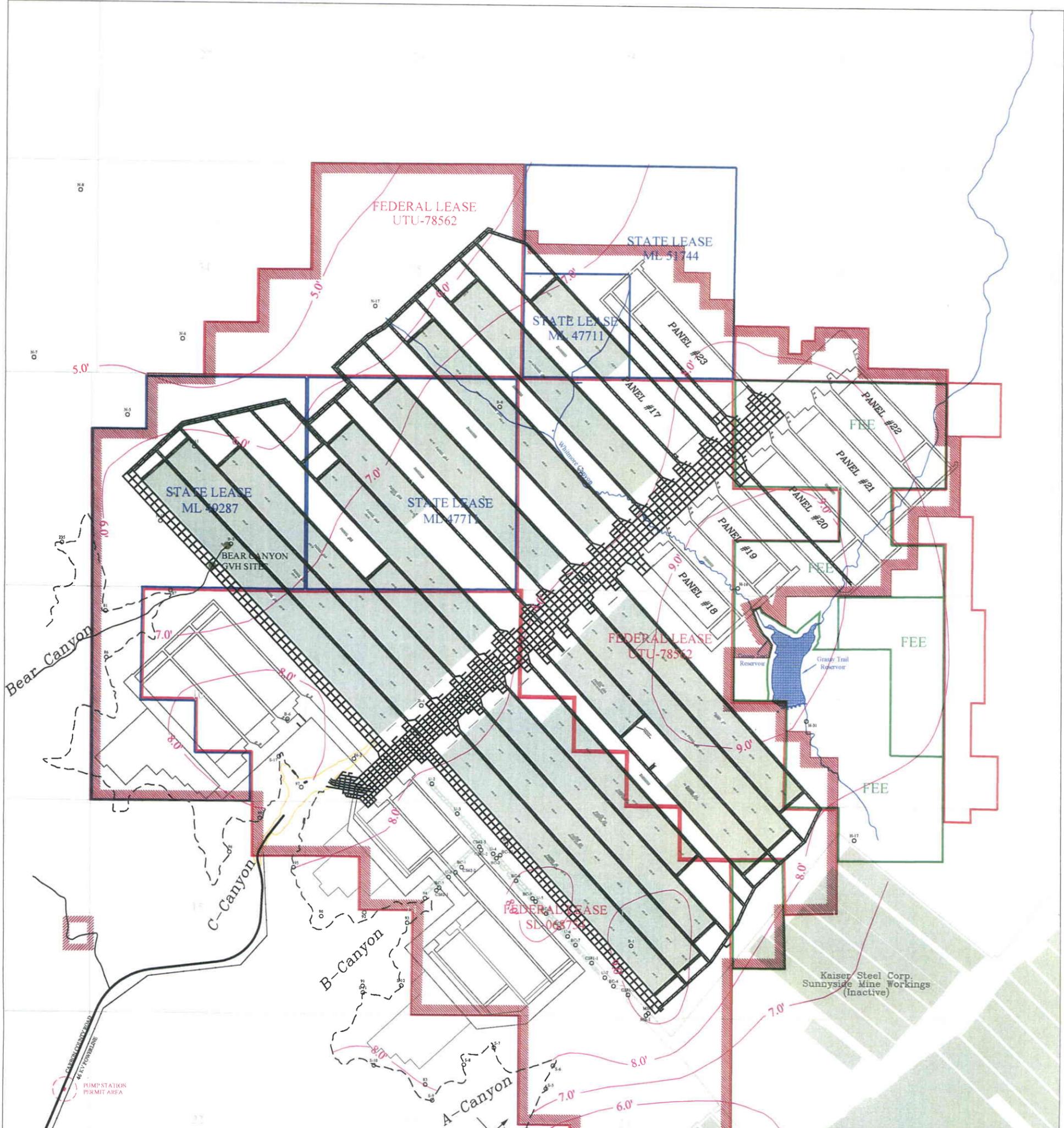
**WEST RIDGE MINE**  
**Map 6-2**  
**Coal Seam Structure Map**

- 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



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 RESOURCES, INC.

SCALE: 1"=2500'



**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.

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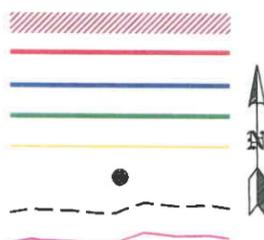
**WEST RIDGE MINE**

**Map 6-3**

**Lower Sunnyside Coal Seam Isopach Map**

**LEGEND:**

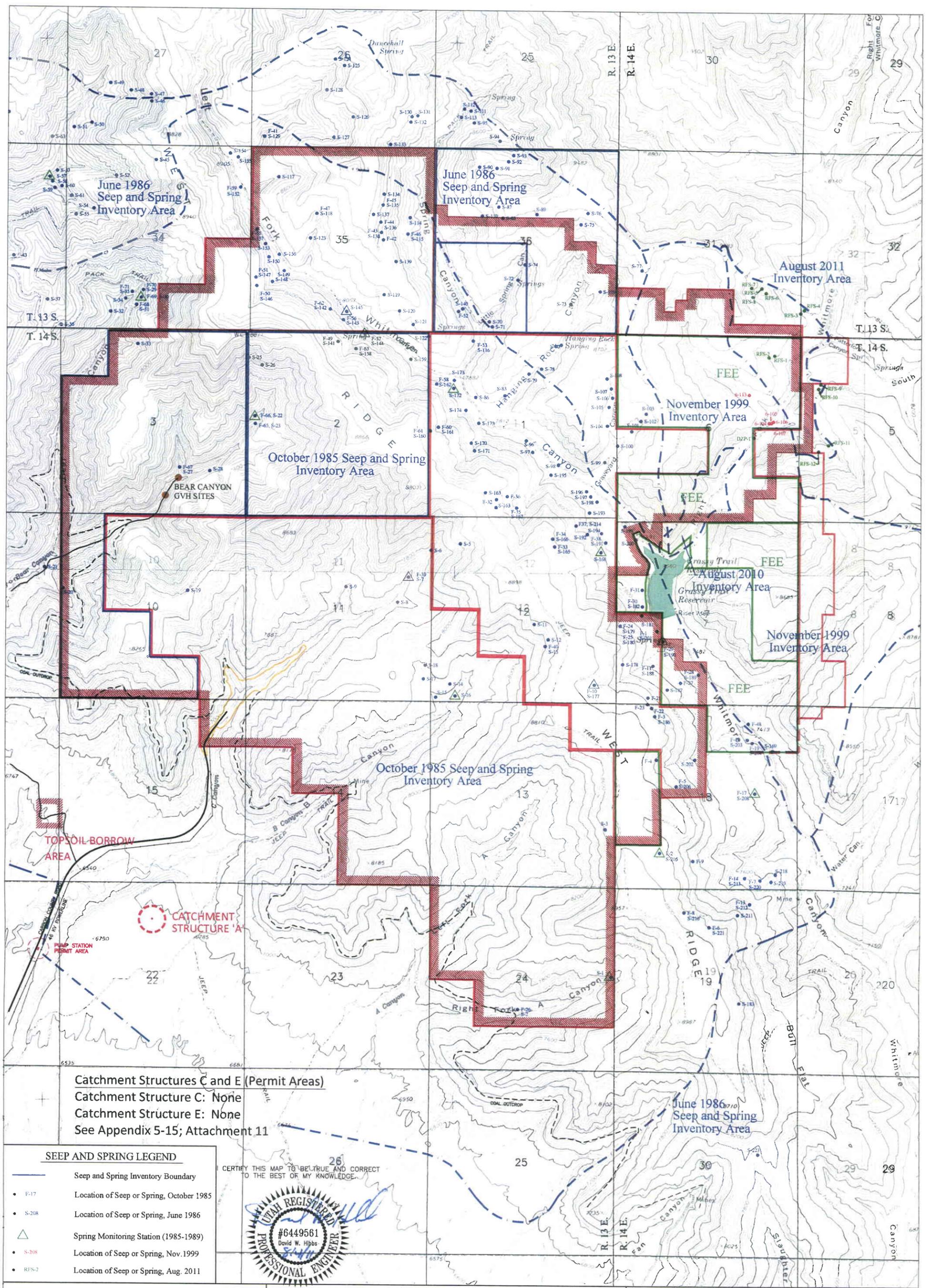
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop
- Coal Isopachs
- Drill Hole/Channel Samples



**WEST RIDGE RESOURCES, INC.**

SCALE: 1"=2500'





Catchment Structures C and E (Permit Areas)  
 Catchment Structure C: None  
 Catchment Structure E: None  
 See Appendix 5-15; Attachment 11

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



**SEEP AND SPRING LEGEND**

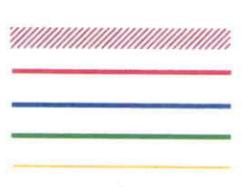
- Seep and Spring Inventory Boundary
- F-17 Location of Seep or Spring, October 1985
- S-208 Location of Seep or Spring, June 1986
- Spring Monitoring Station (1985-1989)
- S-208 Location of Seep or Spring, Nov. 1999
- RFS-2 Location of Seep or Spring, Aug. 2011

# WEST RIDGE MINE

## Map 7-5

### Seep/Spring Survey Map

**LEGEND:**  
 Permit Boundary  
 Federal Lease  
 State Lease  
 Penta Creek Fee  
 Surface Facility Area  
 GVH Site





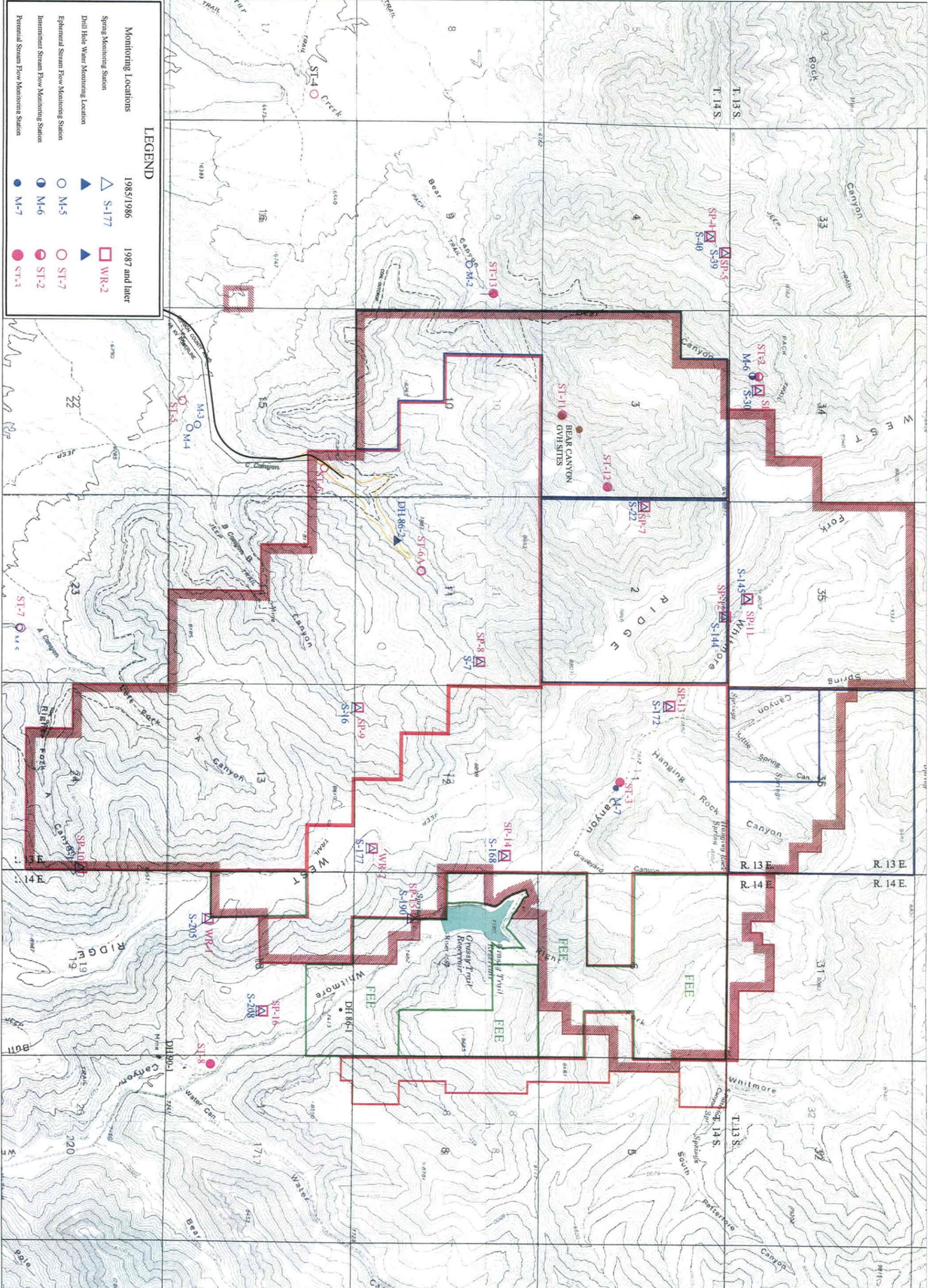
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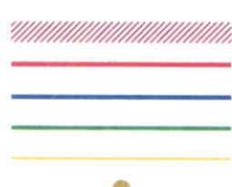
Monitoring Locations	
Spring Monitoring Station	1985/1986
Drill Hole Water Monitoring Location	1987 and later
Epithermal Stream Flow Monitoring Station	
Intermittent Stream Flow Monitoring Station	
Perennial Stream Flow Monitoring Station	

○ S-177	□ WR-2
○ M-5	○ ST-7
○ M-6	○ ST-2
○ M-7	○ ST-1

**WEST RIDGE MINE**  
**Map 7-6**  
**Hydrologic Monitoring Map**  
**(Historical Monitoring Locations)**

**LEGEND:**  
 Permit Boundary  
 Federal Lease  
 State Lease  
 Penta Creek Fee  
 Surface Facility Area  
 GVH Site



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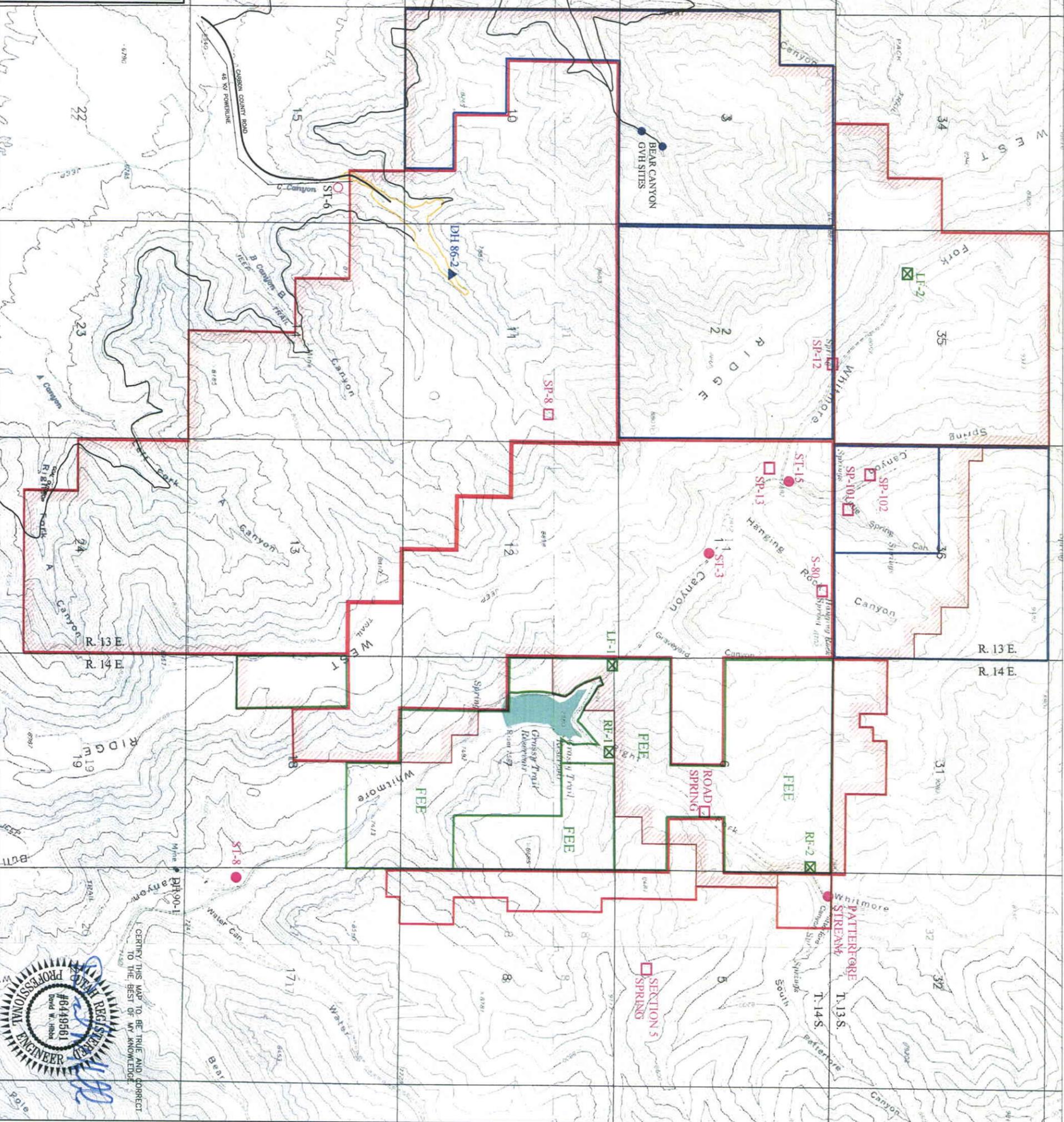
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**LEGEND**

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 ⊠ RF-2



**REGISTERED PROFESSIONAL ENGINEER**  
 David W. Janda  
 #6449861  
 I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE

**WEST RIDGE MINE**  
 Map 7-7  
 Operational Monitoring Locations

DATE: 7-29-11 REV: 25 ACAD REF: MAP7-7 MONITOR-OP REV25

**LEGEND:**

- Permit Boundary ▨
- Federal Lease ▬
- State Lease ▬
- Penta Creek Fee ▬
- Surface Facility Area ▬
- GVH Site ●

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**SCALE: 1" = 2500'**